

THE ENCYCLOPEDIA OF CENTRAL BANKING



The Encyclopedia of Central Banking

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Introduction

Central banking (that is, the variety of policy targets, strategies, and instruments used by monetary authorities all around the world) has become an important topic of discussion in many circles beyond the economics profession, most notably at the political level and in society at large. Owing to the global financial crisis induced by the demise of Lehman Brothers on 15 September 2008, all major central banks in the world have been led to intervene in order to avert the collapse of the global economy, mainly as a result of the meltdown of their “globalized” financial systems. Since then, monetary policy has been in the foreground (to try) to address a number of issues raised by such a systemic crisis at a global level. Both supporters of and opponents to monetary-policy interventions are being forced to learn, from empirical evidence more than from conventional economic wisdom, that several firmly held beliefs in monetary macroeconomics are essentially wrong or flawed. This is so much so that even the nature of money itself is fundamentally different from its simplistic understanding – within the central banks’ community as well as beyond it (see McLeay et al., 2014).

As a matter of fact, the global financial crisis has forced many, particularly within the mainstream of the profession, to rethink afresh how central banks operate and also the nature of money and banking. Indeed, the established view about money’s exogeneity – epitomized by Friedman’s (1969, pp. 4–5) conception of “helicopter money” – as well as the causal link between bank deposits and bank loans, have been proven wrong by an increasing volume of empirical evidence across the global economy. To be truthful, several heterodox economists have been pointing out (since the 1980s, if not earlier) that in our economic systems money is an endogenous magnitude, whose issuance depends on banks’ credit lines independently of any pre-existent deposits with them. In this regard, central banks are settlement institutions on the interbank market, where they set the so-called policy rate(s) of interest in order to hit their monetary-policy goals eventually. That being the case, then any central-bank intervention that does not consider this empirical evidence can only by chance (rather than by design) affect the relevant economic system as intended by policy makers and the scientific community inspiring them. For instance, so-called “quantitative easing” programmes put into practice on both sides of the Atlantic cannot be successful, as they are inspired by the erroneous belief that money is exogenous and the central bank can induce banks to provide more credit lines to both households and non-financial firms just by increasing the volume of banks’ “liquidity” in the central bank vaults.

This *Encyclopedia* aims at providing a critical understanding of central banking, based on a plural perspective on several issues at both theoretical and policy-oriented levels. It intends to explain the complexity of monetary-policy interventions, their conceptual as well as institutional frameworks, and their own limits and drawbacks. It is informative, as it provides the reader with the body of knowledge that is necessary to understand the background of central banks’ decisions in the aftermath of the global financial crisis. It is stimulating, because it offers different and at times controversial explanations of the same subject matter, illuminating it also from a historical point of view. The history of

monetary thinking, indeed, is seminal for understanding both current monetary thought and contemporary monetary-policy decisions – both when they are right and when they are wrong, to paraphrase Keynes's (1936, p.383) argument with respect to economists' ideas.

The more than 150 contributors to this collective effort have been confronted with the challenge of writing nearly 250 entries in a clear and comprehensive way, considering the space constraint imposed by such a voluminous, but synthetic work. They are all warmly thanked for having accepted this challenge, whose outcomes should contribute to a much better, and sound, understanding of an essential item (money) and an important institution (the central bank) for the “common good”. The editors of this volume wish also to thank the publishers, whose professional involvement made it possible for this *Encyclopedia* to see the light in a timely manner for central banking with regard to the still open issues raised by the global financial crisis as well as by its dramatic and still largely unsettled consequences for a variety of stakeholders across the world.

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100% money

Usually associated with the work of Fisher (1935), although supported by other prominent authors (most notably Friedman, 1960), “100% money” refers to a full-reserve backing of bank deposits by a commodity (silver or gold, for instance) or an asset (such as government-issued money, to wit, “outside money”). As it is expected to contribute to the stability of the economic system as a whole, “100% money” is the Gordian knot of some proposals aiming at reforming the monetary system, such as the “Chicago Plan” and the “narrow banking” proposals. In the aftermath of the 2008–09 global financial crisis, “100% money” has become very popular among several civil society movements across Europe (*Positive Money* in England, for instance), which argue for giving the State the monopoly over the issuance of money.

Fisher (1935) suggests a monetary reform that is inspired by the Bank Charter Act of 1844, although it does not reproduce its mistakes. For instance, the Act imposes a strict connection between the notes issued by the Bank of England and its gold reserves, in order to ensure monetary stability. Yet, as the Banking School argues, money, as a means of payment, is not restricted to the notes issued by the central bank, but covers a wide range of credit instruments, such as bills of exchange. Against this background, the 1844 Bank Charter Act was not able to prevent the occurrence of monetary crises in the nineteenth century. This is so because the issuance of notes does not allow the central bank to control the quantity of other credit instruments, which are endogenously determined by the needs of trade.

Fisher’s (1935) reform, however, takes into account bank money, notably checking deposits. According to the author, the problem with a fractional reserve system is the “fact that the bank lends not money but merely a promise to furnish money on demand – money it does not possess” (ibid., p. 7). In other words, the credit instruments issued by banks are partially backed by effective money, to wit, government-issued money. Accordingly, the implications of a fractional reserve system are twofold: (i) banks are subject to a liquidity risk, which represents a major threat for financial stability, notably in the case of a bank run; and (ii) this system exacerbates business-cycle fluctuations, because bank money is issued during periods of expansion and destroyed (when banks demand the reimbursement of loans) during phases of contraction, which may initiate a debt-deflation spiral.

For these reasons, Fisher (1935) suggests separating the issuance of bank money from the granting of credit, thereby transforming banks into purely financial intermediaries. To achieve this, “100% money” advocates a full-reserve backing of bank deposits by government-issued money, whereby the supply of money is governed by a monetary growth rule. In this framework, money will be injected in the economic system by the government, so that a given bank cannot grant any credit to a non-bank agent or another bank, unless it has collected deposits in the form of government-issued money. Among the advantages pointed out by the tenants of “100% money”, two stand out. First, as the credit instruments issued by banks are fully backed by the government-issued money in a full-reserve system, the central bank has complete control over the supply of

2 100% money

money – which is not the case under a fractional reserve system, whereby the level of the money multiplier is unstable. Against this background, “[t]he true abundance or scarcity of money is never registered in the loan market. It is registered by the index number of prices” (ibid., pp. 166–7). Secondly, the full backing of bank deposits by government-issued money reduces banks’ liquidity risk, since the demand for government-issued money by the public is always served. Hence, according to its proponents, “100% money” contributes to both monetary stability and the stability of the economic system as a whole.

However, “100% money” is not immune from critics. From a conceptual point of view, one of its major shortcomings stems from its dichotomous conception of the economic system. As a proponent of the quantity theory of money, Fisher (1935, pp. 166–7) determines the value of money on the product market. This is tantamount to confronting an already-existing quantity of goods, to wit, an initial endowment, with a given quantity of money, which circulates in the opposite direction of these goods. In this respect, as Patinkin (1965) notes, the value of money is the relative price of a composite good exchanged against money at equilibrium. Now, a term of the relative equivalence between goods and money is not defined: the composite good refers to a collection of heteroclites objects, which are not homogenized by money, since the latter is only confronted to goods at the very instant of the exchange. Against this background, the value of money cannot be determined before the exchange takes place. Consequently, economic agents have no reason to hold money during a positive period of time.

As the value of money cannot be determined on the product market, Fisher (1935) imposes an arbitrary scarcity on the market for loanable funds, which renders money a commodity and, thereby, favours a dichotomous conception of the economic system. In other words, since the supply of money required in a real-exchange economy is undetermined, Fisher (ibid.) tries to limit the risks caused by the over-issuance of money by implementing a full-reserve backing of bank deposits and a monetary growth rule, both of which rest on a flawed conception of money.

A more relevant reform of the monetary architecture has to take into account the specificity of the purchasing power of money, which is not an ordinary price, as the value of money is not determined during the market session but has to be assessed before the exchange takes place. In this respect, money is a bookkeeping entry devoid of any (intrinsic or extrinsic) value, unless it is associated with output through the payment of wages, as the monetary theory of production explains (see Graziani, 2003). Such an objective relationship between money and output determines, through the remuneration of labour, the supply of money that is necessary to dispose of the whole output in a monetary economy. All in all, any monetary reform has to distinguish two kinds of banking intermediation: a monetary intermediation, which generates a new income through the monetization of firms’ production (when banks issue money for the payment of wages); and a financial intermediation, whereby an existing income – that is, the bank deposit resulting from the remuneration of labour – is lent for non-productive purposes. Contrary to the reform ensuing from “100% money”, such a reform will rest on a coherent association of money and output, in line with the circuitist approach (see Rochon, 1999, for a discussion on that subject).

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See also:

Banking and Currency Schools; Bank money; Central bank money; Chicago Plan; Endogenous money; Fiat money; Financial crisis; Financial instability; Fractional reserve banking; Free banking; Glass–Steagall Act; High-powered money; Money creation; Money creation and economic growth; Money multiplier; Money supply; Narrow banking; Reserve requirements; Settlement balances.

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A

Amsterdamse Wisselbank

Amsterdam was the first northern European city to establish its own bank in 1609: the *Amsterdamse Wisselbank* (henceforth, AWB), named after “wissel” (“bill of exchange”). The aim was to stabilize and gain control over the currency.

The AWB's founding year coincided with a 1609–21 truce in the 80-year war of the emerging Republic of the Seven United Netherlands with Spain. It marked the beginning of the Republic's “Golden Century” of trade, exploration, military power, science, incipient industrialization, income growth and political organization. In 1609 the seven member provinces of the new Republic were still largely autonomous, each with the right to issue its own currency. Holland's expanding trade required a stable currency, but at the same time it had made the Republic's money popular in the Baltics and other Dutch export destinations (Van Dillen, 1928). With a continuous outflow of its own strong coins, about 40 domestic mints and free inflow of foreign coins, altogether there were about 800 different currencies in use in the Republic, alongside the official money of account, the guilder (or florin) (French, 2006).

Financial transactions in the Dutch Republic of the 1600s were dominated by so-called cashiers, who issued cheques and certificates of deposit. There was continuous withdrawal of good coins from circulation, and the time-consuming and uncertain exchange of cashier certificates for coins (depending on coin stocks) (Van Velden, 1933). In sum, the Republic had no reliable currency, no efficient financial system, and no control over its domestic payment and credit system or over its monetary relations with other countries.

This is what the Amsterdam city council sought to rectify, when it established the AWB and outlawed cashiers in 1609. The AWB was given the exclusive privilege of handling all cheques with a value exceeding 600 guilders, and it guaranteed to pay full-value coins on demand. In practice a dual system of official AWB and private cashier money management developed. In 1659 the Republic established a monopoly on coin issuance. Other currencies gradually diminished in importance. An important reason lay in AWB operations (Quinn and Roberds, 2005).

In 1683 the AWB started accepting deposits of precious metal against receipts, much like a pawnshop. This boosted the inflow of precious metal, which solidified Amsterdam's position as Europe's centre in the silver and gold trades. The receipts themselves became means of payment for the larger trade transactions in the Republic and far beyond. Bullion could be deposited with the AWB at a fee and in return for a receipt. This conferred the right to withdraw the bullion within six months. Simultaneously a credit in the books of the AWB was entered equal to the value of the bullion minus 5 per cent. Bullion could be withdrawn upon presentation of the receipt and against bank money plus a fee. If the depositor failed to redeem the bullion deposit within six months or to renew the deposit term, then the bullion could only be bought back from the AWB at its market price. The fact that many merchants deposited bullion indicates that bank receipts were valued above bullion. Indeed, bullion typically remained in the bank and this gave the AWB interest income due to the 5 per cent

deduction, and from fees for depositing, deposit term renewal, and transfers (Quinn and Roberds, 2005).

The spread of both AWB receipts and bank money may be attributed to the public backing of the AWB, to the fact that large transactions were required by law to be in AWB money, and to the giro banking services the AWB offered. Alternatively, the success of AWB money has been attributed to its alleged 100 per cent backing by bullion, which was a fiction: by 1657 the AWB was already allowing the Amsterdam Treasury and United East Indies Company to overdraw their accounts. A 1795 public investigation found that, in 1760, only one-third of the required bullion was in an AWB vault (Van Dillen, 1928). In the tradition of the then fashionable bullionist sound-money view, this uncovered credit creation caused a public outcry and was duly deplored and then rectified from 1795 to 1802, by which time the AWB had already sunk into irrelevance. In reality, the AWB's public credit creation, financing trade and government, may well have been one of the reasons for its prominence and longevity.

One sign of the popularity of AWB deposits was that a guilder balance at the AWB traded at higher value than a guilder in coin. The difference is called the *agio*. In effect this established two separate units of account, the current guilder and the “banco” guilder – a unit of account officially recognized already in 1659. By taking in all coins at their precious-metal value and issuing receipts against them from 1683, the AWB was attracting so much precious metal that the Dutch guilder was gradually replacing currency from other provincial mints. Sometime during the second half of the seventeenth century, custom or law (probably both) ended deposit withdrawals. AWB deposit receipts had become “outside” money, with no offsetting liability. This gave the AWB more freedom to fight debasements, by raising its agio when the silver content of coins dropped. The AWB was thus instrumental in establishing a reliable payment and credit system for tradesmen and a stable currency, and even engaged in open-market operations on its receipts – and all this at a time when the usual public monetary management method was still coin clipping and “crying down” currency values (Dehing, 2012).

The AWB was closed in 1819, five years after King Willem I had founded *De Nederlandsche Bank*, which became the country's first central bank officially, though not in practice. Over the course of its two centuries' history, the *Amsterdamse Wisselbank* was the Dutch authorities' instrument of choice to transform banking practice, to standardize and control the domestic currency, and to harness the financial system to commercial and public interests. As such, it was the first central bank in modern capitalism.

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See also:

Bullionist debates; Cash; Inside and outside money.

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Asset-based reserve requirements

Asset-based reserve requirements (ABRRs) are regulatory-framework policy proposals requiring financial institutions (FIs) to keep central bank reserves against their diverse asset class holdings. Conceptually, ABRRs are set by the monetary (or regulatory) authority and vary depending on the risk perceptions associated with each asset class. Technically a tax on financial intermediation, ABRRs are most effective if applied system-wide for all FIs.

Given their flexibility, ABRRs have a strong policy appeal in times of financial distress or excessive growth in any particular asset class (for instance, subprime mortgages). Properly structured, ABRRs should help contain asset price inflation with strong micro-economic and macroeconomic potential.

Palley (2000, 2003, 2004, 2007) has popularized ABRRs most vocally, with additional analysis provided by D'Arista (2009), although there has been some criticism (see for instance Toporowski, 2007). Methodologically, ABRRs imply a directly opposite regulation of FIs' central bank reserves. With ABRRs, the FIs hold non-interest-bearing deposits with the monetary authority as reserves based on the FIs' asset holdings. This differs from liability-based reserve requirements (LBRRs) which are common today with a typical deposit-driven required reserve ratio.

Therefore, for FIs, the ABRRs structure results in a real cost of forgone potential earnings on a particular asset (mortgage loans, equity holdings, and so on) owing to higher reserve requirements. FIs are then forced to reallocate larger funds to comply with the regulation. Facing lower returns, FIs are expected to reduce their holdings of the riskier asset and diversify into other asset categories with perhaps lower reserve requirements.

One immediate concern with the implementation of ABRRs is the lack of detailed accurate information about FIs' balance sheets, as transactions with multiple asset types vary substantially across FIs and markets. Toporowski (2007) also points to policy ineffectiveness, owing to FIs' excess reserves holdings. Though a valid concern, the global financial crisis of 2008–09 has shown that excess reserves are typical of a profit-maximizing firm. With cash acting as a raw material as well as an asset, it is expected that during relatively stable economic periods, FIs will extend loans and invest in interest-bearing assets, while keeping the reserves to a regulatory minimum. In times of economic distress, the opposite would hold, as evidenced by the unprecedented high excess reserves holdings in the US banking system (at the time of writing in 2014).

Conceptually, then, ABRRs serve several purposes as implicit automatic stabilizers. Varying by asset category, ABRRs allow the monetary authority to impose restraints on certain types of financial activity without raising general interest rates. Hence subprime mortgage lending could be discouraged by raising the costs for FIs via higher reserve requirements associated with such loans, without having a direct impact on investment loans and healthy economic growth. As asset values fall, ABRRs generate monetary easing effects, releasing previously held reserves. This mechanism also allows scaling a rapidly expanding financial system for example, offering more flexibility in restraining bubble-like scenarios.

At a microeconomic level, ABRRs may be used to allocate funds for public purposes in infrastructure and elsewhere. This could be encouraged by monetary authorities setting lower reserve requirements on such types of loans and investment projects. Critically, in

the current post-crisis framework, ABRRs could be a useful tool as central banks scale back their quantitative easing programmes. A gradual increase in ABRRs leads to a reverse quantitative easing that ensures a smooth transition to a new macroeconomic environment. Separately, ABRRs offer opportunities for increased seigniorage revenue as fiscal policy capacity runs out of steam, imposing an economically efficient tax on FIs.

Finally, as the above arguments suggest, ABRRs render monetary policy relevant as a development instrument in the continuously transforming global financial economy.

A variant of ABRRs exists today in the US insurance industry, where overseeing agencies (for instance, the national Association of Insurance Commissioners' Securities Valuation Office) identify insurers' assets by risk categories. Through a series of regulations, insurance firms are required to hold reserves against their assets for purposes of liquidity provisions.

More recently, in compliance with the Basel III accord, the Federal Reserve Board of Governors (2013) proposed a framework for a new standardized minimum liquidity requirement for large systemic banking organizations (primarily with over 250 billion US dollars in assets) that may also have significant exposure to international markets. According to the proposed liquidity requirement ratio (LCR), FIs are required to keep a minimum amount of high-quality liquid assets (narrowed down to central bank reserves and public and private debt easily convertible into cash) measured up to 100 per cent of the FIs' net cash outflow over a 30-day period. The rules are being clarified at the time of writing (in 2014) and are expected to advance the new and stricter regulatory environment ahead (by 2017) of the analogous Basel III implementation phase (scheduled for 1 January 2019).

Similar regulatory requirements are being imposed on banks in China with a 100 per cent LCR by the 2018 target in an effort to stem excessive interbank lending and sporadic cash dry-outs in the Chinese financial system. How far the new Basel III-inspired LCR rule (on top of capital adequacy rules) will go in ensuring global financial system stability is yet to be seen. For now, it appears to be consistent with the original ABRRs vision designed for a wider-scale application, as the financial system absorbs and adapts to new requirements and operational changes.

The ultimate goal behind the ABRRs proposal is greater financial stability across all FIs in the economy.

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See also:

Asset price inflation; Basel Agreements; Bubble; Capital requirements; Credit bubble; Debt crisis; Financial bubble; Financial crisis; Financial instability; Housing bubble; Macro-prudential policies.

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Asset management

Asset management is the investment of financial assets by a third party. Financial assets under management (AUM) are categorized according to asset classes: equities, bonds and alternatives such as property, currency and commodities. Equities represent an ownership interest in another corporation, including a share of the profits as a dividend and a claim in the event of bankruptcy. Bonds represent an obligation to repay a loan and, normally, a coupon. Alternatives include a wide range of tradeable assets where the asset manager expects to earn a profit.

There are two main investment strategies: active and passive management. Under active management, there is often greater flexibility in the investment mandate. Passive management or index-tracking funds are more closely aligned to a benchmark, which usually reflects the market capitalization of a broad set of constituent assets in a sector or country. Passive management took off after the 1970s and had a 13 per cent share at the end of 2005 (Pastor and Stambaugh, 2012, p.759). Both active and passive strategies encompass a variety of investment objectives such as yield or growth maximization, tax avoidance and socially responsible investment. Funds are also segregated by asset class, country and industry sector. Lastly, funds often incorporate derivatives such that a Brazilian equity fund might be denominated in US dollars.

The quantitative techniques of asset management have their origins in a broad body of theoretical work (Markowitz, 1952; Modigliani and Miller, 1958; Merton, 1972; Black and Scholes, 1973). These techniques are used to construct a fund from a combination of derivatives, risky assets and a risk-free asset, usually a government bond. By synthetically matching the risk and return characteristics of third-party benchmarks, managers distance themselves from the investment decision. These decisions are retained by the investor, who in turn might rely on investment advisors, benchmark and performance data.

Quantitative techniques also introduce new problems. They extrapolate return and risk from historical data, ignoring Knightian uncertainty and assuming a normal distribution of returns despite contrary evidence (see Mandelbrot, 1963). The use of derivatives introduces counterparty risk as well as profit opportunities for other financial actors. Index-tracking ignores Roll's critique that the benchmark is hypothetical and unobservable (Roll, 1978); an index-tracking fund can miss out on profit opportunities or anomalies unless a specialized benchmark is used. Assets that have a lower volatility (called "beta") than the benchmark have been shown to outperform; currency markets have shown long-term profit opportunities (carry trade); and the existence of high net worth financial actors is another persistent anomaly.

Asset management is concentrated in relatively small numbers of global firms that are geographically concentrated. In 2012, global AUM were 120 billion US dollars or 170 per cent of gross world product. Around two-thirds are long-term investments

managed by pensions, insurance and mutual funds. The remainder are managed on behalf of wealthy individuals and sovereigns in private wealth, sovereign wealth, private equity and hedge funds. Almost half are US firms, and clusters exist in global financial centres such as New York and London (TheCityUK, 2012, p. 4). This concentrates equity ownership interests. Tracing ownership connections between transnational corporations (TNCs) shows that “nearly 4/10 of the control over the economic value of TNCs in the world is held [. . .] by a group of 147 TNCs in the core” (Vitali et al., 2011, p. 4). The top 15 TNCs are either fund managers or combined fund managers and investment banks.

There has been an observed tendency for smaller funds to disappear due to the selective culling of underperforming funds (Elton et al., 1996) as well as mergers and acquisitions. In Europe, the single market has enabled further consolidation. The intention of the Undertakings for Collective Investment in Transferable Securities (UCITS) Directives, which began in 1985, was to create a single market for asset managers across Europe; it also created problems in cross-border regulation and opportunities for regulatory arbitrage. The UCITS *cause célèbre* was Bernard Madoff’s asset management firm, revealed in 2008 as a massive Ponzi scheme. The firm had been UCITS-registered in Luxembourg and was responsible for “the largest investor fraud ever committed by an individual” (Weber and Gruenewald, 2009, p. 1). In Luxembourg, local regulations permitted custody of the non-existent assets in the United States without direct surveillance.

Asset management is therefore of concern to central bankers and regulators from several perspectives: financial stability, competition policy, and the ongoing possibilities of fraud and collusion.

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See also:

Capital requirements; Carry trade; Financial innovation; Financial instability; Financial supervision; Investment banking; Liability management.

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Asset price inflation

Asset price inflation is a rise in the price of an asset that does not reflect a relative change in the price of that asset. It is not a term that is currently widely used or carefully defined, although one sees it in print at various times (Schwartz, 2002; Piazzesi and Schneider, 2009). To formally define asset price inflation, one must define both inflation and asset, neither of which is easy or unambiguous.

In earlier times (pre-1930s), inflation was defined as an increase in the money supply (Bryan, 1997). At that time, in the definition, it was noted that such increases were often accompanied by increases in prices, but the determining factor of inflation was increases in the money supply. As long as the money supply was the *numéraire*, and was thought of as a physical asset (primarily gold), that served as a reasonable definition. Inflation was the inverse of the price of gold; that is, a fall in the price of gold relative to prices of other things that people bought (both assets and goods).

As money became thought of as separate from gold, that definition of inflation no longer remained clear-cut, but the convention of defining inflation in terms of an increase in the money supply remained. A problem remained, however, as it was unclear what the money supply was: there were many alternative definitions of money, and there was no compelling reason to use one over the other, and thus there was no unambiguous definition of inflation. At that point, inflation started to be defined in terms of an increase in the price of produced goods, not in terms of an increase in the quantity of money.

Precisely what was meant by “goods” was unclear, and over time a number of conventions developed as to what goods would be included. Inflation became thought of as the change in the price level of produced goods. Economists developed formal measures of output and price indices, developing well-specified concepts such as real GDP, GDP deflator, CPI, core CPI, and CPE, among others. People’s conceptions of inflation followed these formal measures, and earlier definitions of inflation relating it to the money supply faded away. That led to the way most people think of inflation today, to wit, as an increase in the price level of goods as measured by an inflation index for produced goods.

None of these measured concepts was a perfect indicator of changes in the price level of goods, but theoretically they gave a workable measure of the price of a “real” basket of produced goods over time. Initially, economists distinguished relative price changes over time (what one may call real price level changes) from nominal price level changes in the basket of produced goods. They did this by emphasizing that inflation had to be an ongoing change in prices: a one-time change would not count as inflation. That convention faded away, although distinguishing core inflation (which is more likely to be ongoing) from the full measures of inflation (which include temporal relative price fluctuations) relates to that distinction.

What was left out of these “produced goods price” definitions of inflation was assets. Thus, as inflation became associated with changes in the price level of produced goods, the price of assets slowly moved out of the definition of inflation, and what one may call asset price inflation fell from economists’ radar screens. One of the reasons for this was theoretical developments in asset pricing theory, and specifically the development of the efficient market hypothesis, which held that the prices of assets reflected their real value. If asset prices reflected their real value, there could be no asset inflation: changes in asset prices were simply intertemporal relative changes in the prices of assets over time.

A theoretical challenge to these conventions came from Alchian and Klein (1973), who argued that the appropriate concept to measure inflation should include asset prices as well as goods prices. Specifically, they argued that measures of inflation should relate to the current cost of expected lifetime consumption, not just to current consumption. To capture the current cost of expected lifetime consumption, the measure of inflation would have to include asset prices as well as goods prices. In fact, it would give a much greater relative weight to asset prices. Pollack (1989) and Shibuya (1992) developed rough measures of such an index in which asset weights in the index were as much as 97 per cent of the relevant measure. This work has not been followed up, and today inflation is almost thought of as changes in the price of produced goods only. The concept of asset price inflation to a large degree disappeared. (Interestingly, however, deflation is discussed in terms of asset prices. Were that not the case, there would be almost no discussion of deflation, as an index of goods prices almost never falls significantly.) Thus, the current reality is that we do not have a meaningful measure and a solid understanding of asset price inflation.

In order to have a meaningful concept of asset price inflation, one must have a concept of “real asset”, which means that one cannot hold the efficient market hypothesis. At an individual asset level, distinguishing whether a change in an asset price is an intertemporal relative change (as the efficient market hypothesis holds) or a bubble is close to impossible. But at the aggregate level of all assets it may be easier, because one would expect to see fewer intertemporal relative price changes. Thus, in his textbook explanations of asset price inflation, Colander (2013) does not focus on the price of any one asset, but rather on a concept that he calls “real wealth”, which is the stock equivalent to the flow concept of real output. He contrasts real wealth with nominal wealth as a parallel to the contrast between real output and nominal output. Real wealth is the productive capacity of the economic system, while nominal wealth is the money measure of that productive capacity, and the difference in the change of these measures is asset price inflation. Just as real output is differentiated from nominal output by goods price inflation, so too is real wealth differentiated from nominal wealth by asset price inflation.

In steady-state equilibrium real wealth will grow at the same rate as real GDP, assuming no major structural changes, so we can get an idea of the degree of asset price inflation relative to goods price inflation by comparing nominal wealth to nominal GDP. If nominal wealth grows more than nominal GDP, then there is asset price inflation. If it grows less, there is asset price deflation, where the reference point is the goods price level. As Colander (2013) shows, since the mid 1990s the prices of assets have risen significantly more than the prices of goods, suggesting that, on average, asset price inflation has exceeded goods price inflation since that period. The rate of asset price inflation has been uneven, and there have been intermittent periods of asset price deflation that have partially offset the net difference. One reason asset price inflation has exceeded goods price inflation is that government policy has encouraged asset price inflation even as it attempts to hold down goods price inflation.

DAVID COLANDER

See also:

Asset-based reserve requirements; Basel Agreements; Bubble; Capital requirements; Credit bubble; Debt crisis; Efficient markets theory; Financial bubble; Financial crisis; Financial instability; Housing bubble; Inflation; Macro-prudential policies.

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Asymmetric information

Asymmetric information reflects a view among New Keynesian economists that allows for incomplete markets on account of the fact that principal and agent do not possess the same degree of information about a particular event or state. This perceived informational asymmetry weighs heavily on the New Keynesian credit-channel theory of the monetary policy transmission mechanism, based on the loanable funds view of the rate of interest, whereby the real rate of interest acts as a price-rationing device to equilibrate the supply and demand for loanable funds. New Keynesians acknowledge that the real rate of interest may not perform this equilibrating function when the demand for loanable funds rises beyond certain levels. Lenders may withhold credit to otherwise creditworthy borrowers rather than offering loans at higher rates of interest even if these borrowers would be willing to pay those higher rates. Money neutrality is violated as the predicted link between changes in high-powered money and the money stock is upset. Output and employment are then less than their full-employment counterparts.

The source of this low-level equilibrium in the credit market is attributed to what Dymski (1998, p.21) calls "the asymmetric distribution of information between incentive-incompatible principal and agent, together with an exogenous source of risk" (see Stiglitz and Weiss, 1981 and 1992). Lenders cannot trust that they have the same information about the viability of loans as do those to whom they are lending; perceived information is then asymmetric. Lenders cannot know the expected marginal product of potential investment projects with the knowledge held by borrowers. They worry that increased demands for "loanable funds" that prompt rising interest rates may cause creditworthy borrowers to drop out of the market for these funds, leaving a pool of potential borrowers who may engage in riskier projects with higher probabilities of failure (adverse selection and incentive effects).

Suppliers of “loanable funds”, who have less information about the prospective yields on these projects than the demanders, worry that the likelihood of non-repayment could heighten. This perceived increase in default risk might put the risk composition of bank portfolios in jeopardy of irretrievable capital loss. The rational strategy for them under such circumstances is not to lend to these demanders of loanable funds at higher rates of interest, but instead to deny them the ability to borrow these funds; that is, to use quantity rather than price as the credit-rationing device.

Among the consequences of this credit rationing on account of perceived asymmetric information are distributional concerns (small businesses that do not have access to other forms of finance except bank loans are crowded out of the market for loanable funds) and macroeconomic concerns in the form of effective supply failures (firms that could otherwise sell produced output cannot gain access to finance to initiate that production) (see Blinder, 1987; Stiglitz and Greenwald, 2003).

Seen in a larger context, the idea of asymmetric information as the decisive factor in the clogging of finance and output markets is simply not persuasive. What is significant, instead, is the pervasive sense among all market participants that the future is uncertain, and not reducible to individual risk calculations (see Dow, 1998; Dymski, 1998; Isenberg, 1998). This type of uncertainty stems from the fact that individuals cannot know the prospective yields on whatever assets they may purchase (either real or financial). The prospective yield on any asset is not merely a function of its marginal productivity (in the case of a capital asset) or its marginal productivity once removed (in the case of a financial asset purchased to underwrite the capital expenditure). The return on such assets is also a function of the number of other individuals who engage in such activities and of the perceptions of individuals on the outcomes of those prospective activities. Uncertainty in this sense is a socially-constructed phenomenon internalized by individuals. The conditions underlying the supply and demand for so-called loanable funds are interdependent, not capable of deconstruction into separate individually-founded supply and demand functions mediated by some real rate of interest. This common behaviour, whether it be financial institutions sitting on cash reserves or firms sitting on retained earnings (both evidenced in the aftermath of the Great Recession of 2007–09), is motivated by a desire to remain liquid in light of an uncertain future, what Keynes identified as liquidity preference (Keynes, 1936; see also Bibow, 2006).

Moving beyond the narrowly defined New Keynesian framework of credit rationing based on asymmetric information about borrowers’ and lenders’ risks makes myopic and one-sided the case for effective supply failures as the primary factor in the explanation of low-level economic activity (see Rotheim, 2006). A more general framework based on the pervasive nature of uncertainty requires a general theory of effective demand, as was laid down by Keynes (1936), where employment and output for the economy as a whole reflect the interaction of effective supply and demand, each determined by employers’ expectations of prospective revenue associated with any level of employment. Finance and access to finance are critical factors in understanding the ability of firms to effectuate these employment decisions. Access to external finance and the decision to engage internal finance rely on an accommodative central bank as well as the liquidity preferences of firms and financial institutions (banks and shadow banks).

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See also:

Credit rationing; High-powered money; Liquidity trap; Monetary policy transmission channels; Money neutrality; Shadow banking; Yield curve.

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B

Bagehot rule

In *Lombard Street* (1873), Walter Bagehot argued that, in a banking crisis, central banks should lend early and without limits to solvent firms against good collateral, albeit at a high rate of interest. Known as the Bagehot rule, this principle has been invoked whenever there has been a serious banking crisis as the basis for the central bank's lender-of-last-resort policy.

Bagehot, influential as editor of *The Economist* magazine, developed his policy rule in response to the banking panics of 1847, 1857 and 1866. He argued that the Bank of England reacted late and with great reluctance in these crises. For instance, during the 1866 crisis, the Bank provided liquidity support only after the collapse of *Overend, Gurney & Company Bank* contributed to a great banking panic. Bagehot approved of the Bank of England intervention, but suggested it would be better if the Bank officially acknowledged its role as lender of last resort, as only it could save the financial system in a crisis: "The only safe plan for the Bank is the brave plan, to lend in a panic on every kind of current security, or every sort on which money is ordinarily and usually lent" (Bagehot, 1873, p.90). The Bank of England therefore had a responsibility to support the liquidity of the banking system based on its role as issuer of money and manager of the country's reserves.

The Bagehot rule has been subject to quite different interpretations since it was first put forward in 1873. First, there is the recurrent issue of solvency. According to Bagehot, central banks should limit their support to illiquid but solvent firms. Yet this distinction can be hard to draw in the midst of a crisis. If solvency and liquidity problems could be so easily separated, there would not be a need for a lender of last resort. Also, the decision to lend or not to lend will always involve a substantial element of judgment, especially if the central bank chooses to take a long-term view of solvency (Stein, 2013).

Second, it is equally hard to determine what constitutes good collateral. This will require keen judgments of asset values, especially in situations where markets have ceased to operate properly. Bagehot (1873, p.90) argued that if the market knew that the Bank of England would advance liquidity on "what in ordinary times is reckoned a good security", then "the alarm of solvent merchants and bankers will be stayed".

Third, there is the recurrent discussion of whether lending of last resort should be provided at a penalty rate of interest. Many have argued that central bank support should be provided at a penalty rate of interest to limit moral hazard and secure early repayment of central bank assistance. It is interesting to note, however, that Bagehot did not use the term "penalty rate" in his book, but referred consistently to "high rates" of interest (Goodhart and Illing, 2002). He was concerned with the external drain or loss of gold, since England was on the gold standard at the time, and the high rate of interest was required to stem the outflow of gold. In a fiat money system with a floating exchange rate, this should be of lesser concern.

The Bagehot rule has gained new importance during the financial crisis that erupted in 2007, as central banks tested its limits and developed new and unconventional policy measures to combat the crisis (Bernanke, 2008). Traditionally, central banks would

primarily provide liquidity to banks (or credit institutions) to support parity between private bank money and central bank money. During the 2008–09 crisis, however, some central banks also lent to non-bank financial institutions (investment banks and insurance companies) in order to protect the integrity of the wider financial system. Some central banks even supported financial markets, buying financial instruments to maintain orderly market conditions. This extension from traditional “lender of last resort” for banks to a much wider role as “market maker of last resort” was applauded by some, who looked at it as a new interpretation of the Bagehot rule for a modern money-market financial system (Carney, 2013).

Many central banks also extended the maturity of their extraordinary liquidity assistance and extended the list of eligible collateral. Despite these changes, many banks were reluctant to borrow, owing to the “stigma problem”: common knowledge about their borrowing could worsen their financial conditions. To overcome this problem, central banks increasingly provided liquidity through anonymous auctions, where the identity of borrowers would not be publicly known. This has tended to blur the distinction between discretionary lender-of-last-resort liquidity loans and regular monetary policy operations. The massive liquidity injections by central banks after the 2008–09 global financial crisis has thus led to a new area of unconventional monetary policy, with renewed discussions of the proper terms and conditions for central bank liquidity support, just like in 1873, when Bagehot’s famous book was published (Moe, 2014).

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See also:

Bagehot, Walter; Bank of England; Bank run; Central bank money; Collateral; Fiat money; Financial crisis; International reserves; Investment banking; Lender of last resort.

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Bagehot, Walter

Walter Bagehot was born in Langport, Somerset, on 3 February 1826, and died on 24 March 1877. He studied at Bristol College and then University College, London, where he met Richard H. Hutton. They founded the *National Review* together in 1855 (see Buchan, 1959) and it was through Hutton that Bagehot came into contact with *The Economist*, becoming its editor-in-chief in 1860.

Scholars generally regard Bagehot as a practical economist. Keynes (1915, p. 369) thus describes him in his review of Barrington’s work (Barrington, 1915) as “a psychologist –

a psychologist analyser, not of the great or of genius, but of those of a middle position, and primarily of business men, financial, and politicians". This view is mainly due to the somewhat psychological nature of the business cycle in Bagehot's thoughts and the psychological nature of the effects of the monetary policies (see below) that he suggests in order to ensure confidence in the monetary institutions. Bagehot did indeed always take a pragmatic approach to economic issues, and tried in particular to draw from economic science ideas and methods capable of combining theory and practice (see Berta, 1986, p. 31).

This particular method also led him to address monetary and financial questions, as can be clearly seen in his well-known work *Lombard Street: A Description of the Money Market*, published in 1873 (see Bagehot, 1873). The title itself suggests a relativistic approach to monetary matters, which are addressed in historical and institutional terms. Bagehot then develops a monetary theory by examining different features of money, especially its effects on the stability of economies. The functioning and limitations of the money market are described in normative terms, the main concern being the identification of the best monetary practices serving to ensure monetary stability and confidence in the monetary institutions. He makes essentially two recommendations in this connection, and both regard the central bank. The first, which is known in the literature as the Bagehot rule (see Goodhart, 1999), states that the central bank must act as the lender of last resort to ensure the solvency of the credit system. In short, the rule requires the central bank to be accommodating towards organizations that lack liquidity but are nevertheless solvent: "loans should [. . .] be made on all good banking securities, and as largely as the public asks for them" (Bagehot, 1873, p. 198). The second is that discretionary mechanisms should rule the level of reserves: "That the amount of the liabilities of a bank is a principal element in determining the proper amount of its reserve is plainly true; but that it is the only element by which that amount is determined is plainly false [. . .]. I am satisfied that the laying down such a 'hard and fast' rule would be very dangerous; in very important and very changeable business rigid rules are apt to be often dangerous" (ibid., pp. 302, 315).

This normative analysis is supported by a positive investigation of the business cycle, which is seen as primarily subject to panic and euphoria, variables that Bagehot treats sometimes as exogenous and sometimes as endogenous. In his perspective, the cycle starts when banks lend a "surplus of [. . .] capital" (ibid., p. 148) to firms in order to expand their production. As credit causes a rise in prices, firms expect higher profits, which prompts them to seek additional credit in order to increase production again. This expansive phase is, however, combined with increasing fragility of the system, and growth ceases when firms start to make mistakes in their evaluation of expected demand and/or when a section of the community will no longer accept the rise in prices. The result is a fall in production leading to crisis. At the same time, a crisis can take place when a "sudden event [. . .] creates a great demand for actual cash" with which the banks are unable to cope (ibid., p. 122). The banking system is struck by a liquidity crisis that then moves into the real sector through the resulting credit squeeze. In developing this theory, Bagehot (ibid., pp. 196–7) focuses on the role of monetary policy and advocates a discretionary approach, especially during recessions, as "the best palliative to a panic is a confidence in the adequate amount of the Bank reserve, and in the efficient use of that reserve".

Different economists took a positive view of Bagehot's work. Jevons, for example,

judged it “the best account which we have of the working of our banking system” (quoted in Barrington, 1915, p.418). At the same time, however, Jevons was sceptical about the possibility that cycles could be “ruled” by monetary policy when business is not carefully managed.

Various aspects of Bagehot’s theory have since been reconsidered in a more critical light. Garcia (1989), for example, refutes Bagehot’s rule in factual terms by showing that for a long time in the United States the Federal Reserve, acting as a lender of last resort, favoured just one type of organization, namely commercial banks, and operated “behind closed doors” (see Selgin, 2012). Goodhart (1999, p.339) criticizes some associated myths, in particular “that it is [. . .] possible to distinguish between illiquidity and insolvency [and] that [lender-of-last-resort] capacities are unlimited”. Finally, the most recent literature addresses Bagehot’s rule at the microeconomic level by studying the effectiveness of the lender of last resort when market failures occur (see for example Bordo, 1990; Freixas et al., 2000; Martin, 2009).

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See also:

Bagehot rule; Financial crisis; Financial instability; Lender of last resort.

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Bancor

Bancor is the name of a supranational money proposed by Keynes in his plan (hereafter KP) at the Bretton Woods conference in 1943–44. The original idea can be found in Keynes’s *Treatise on Money* (1930 [1971]), in which he argued that the ideal solution for the international monetary system is the constitution of a supranational bank for national central banks (ibid, p.358). Being conscious of the difficulties of realizing this project, Keynes based his plan on five fundamental principles, namely gradualism, banking approach, symmetric responsibility of adjustment, complementarity, and multilateralism.

The gradualism principle satisfies the need of accepting lower degrees of supranational

management to make it more politically acceptable, but leaving the road open to future improvements: “Is the system of supernational currency management of the future to be born ready-made or gradually evolved? Probably the latter” (Keynes, 1930 [1971], p. 354). To realize the best compromise on this ground, the KP proposes an International Clearing Union (ICU), which runs a supernational settlement system for the payments between national central banks. The balance sheet of the i th central bank expressed in its own currency is therefore:

$$D + \text{bancor} + G + OR = B + OD \quad (1)$$

On the assets side, D represents domestic assets while international reserves include bancor, gold (G) and other reserves (OR). Each central bank can open an account in bancor at the ICU in exchange of gold, at a fixed but adjustable rate of exchange. The convertibility rule is only one way, from gold to bancor. Hence the bancor system favours the gradual demonetization of gold, leaving the total amount of international reserves unchanged. On the liabilities side, B denotes the monetary base and OD denotes overdraft facilities obtained from the ICU when the central bank has depleted its stock of bancor. This credit opportunity introduces the principle of the banking approach in the ICU operations. The aggregate balance sheet of the ICU is therefore:

$$G_{ICU} + \sum OD = \sum \text{bancor} \quad (2)$$

where the liabilities side records the total amount of bancor accounted to the participating central banks (to simplify, we suppose equal to one all the exchange rates between bancor, gold and national currencies). The assets side shows the two channels of bancor creation: gold substitution (G_{ICU}) and the total overdraft ($\sum OD$) of bancor borrowed from the ICU.

The overdraft channel has important consequences. First, the total amount of international reserves increases as much as central banks of deficit countries use OD facilities to pay central banks of surplus countries, whose bancor deposits increase. Second, bancor balances are created endogenously, depending on the evolution of international imbalances that could determine OD increases or repayments. This feature characterizes the ICU as an institution less powerful than a supernational central bank that controls exogenously the amount of international liquidity.

The endogeneity of bancor could fuel a potential risk of inflationary bias. Such risk is minimized by the assignment to the ICU of the surveillance on the application of the rules of the game. The main rule is founded on the principle of symmetric burden of adjustment as “a significant indication that the system looks on excessive credit balances with as critical an eye as on excessive debit balances, each being, indeed, the inevitable concomitant of the other” (Keynes, 1943 [1969], p. 23).

In the KP, excessive positive and negative bancor balances that deviate from established quotas are discouraged by penalty interest rates. However, the participation of creditor countries in the adjustment process poses the greatest challenge. They must be convinced to accept bancor balances in the short run, but not to hoard them in the long run. In stressing the need to share the burden of adjustment, Keynes trusted on the best compromise between domestic full employment and international stability:

it is “the simultaneous pursuit of these policies by all countries together which is capable of restoring economic health and strength internationally” (Keynes, 1936 [1973], p. 349).

However, the KP recommends no blind application of the rules of the game. The shared responsibility of adjustment does not necessarily mean simultaneous adjustment. The sequence of adjustment must be dictated by the need “to offset deflationary or inflationary tendencies in effective world demand” (Keynes, 1943 [1969], p. 20). Even the sterilization of the monetary base (*B*), through the compensation of undesired changes in bancor deposits with domestic assets (*D*) in the central bank’s balance sheet, could be acceptable in the short run to allow enough time for the adjustment process.

According to the complementarity principle, in the KP national currencies retain their function of international reserve assets for intervention in foreign-exchange markets. However, complementarity must be matched with the principle of multilateralism. While international reserves held in national currencies imply bilateral credits *vis-à-vis* debits of the issuing foreign countries, bancor balances are a multilateral asset *vis-à-vis* the ICU. Multilateralism has two stabilizing outcomes. First, central banks gain one degree of freedom in their reserve allocation. For example, they can substitute US dollar-denominated reserves, selling US Treasury bills, with bancor balances at the ICU. Second, the key-currency country (the United States) faces an external balance constraint related to the deterioration of its bancor position. In our example, the ICU records more bancor balances for the creditor-country central banks and fewer bancor balances (or more *OD*) for the US central bank (Fed). The Fed could sterilize its bancor constraint with more domestic assets (*D*). But in this case monetary sterilization would be a deliberate non-cooperative action, while in the US dollar standard system the sterilization is an automatic privilege. This is a key result of the KP that has been underscored.

The bancor was not adopted at the Bretton Woods conference, because the US dollar was the currency of the dominant country, which at that time was the largest net creditor in the world. Since then the situation has completely changed, with new emerging creditors and the United States as the largest debtor country. In the current polycentric world, a supranational management of the international monetary system appears increasingly necessary and the principles of the bancor in the KP are still crucial in this regard.

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See also:

Bretton Woods regime; International Monetary Fund; International settlement institution; Keynes as monetary adviser; Keynes Plan; White, Harry Dexter.

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Bank Act of 1844

The Bank Act of 1844 followed the 1819 return to the gold standard: that is, convertibility of banknotes into gold, which had been suspended since 1797; the 1819 Act stipulated a conversion rate of £3/17s/10½d (3 pounds, 17 shillings and 10½ pence) per ounce of gold.

The Bank Act went into operation on 31 August 1844. The main provisions were:

- (1) The creation of two distinct departments in the Bank of England: the “Issue Department” in charge of issuing banknotes (“promissory notes payable on demand”) and the “Banking Department” in charge of the “general banking business” of the Bank.
- (2) The transfer to the Issue Department of 14 million pounds of securities as well as the gold and silver bullion held by the Bank of England. From 31 August 1844, new banknotes would be issued only in exchange for gold or silver. The amount of securities held by the Issue Department could be reduced but never increased, except in specific cases, discussed below.
- (3) The silver bullion held by the Issue Department would be limited to a fourth of the gold coins and bullion held in the Department.
- (4) The Issue Department would be authorized to increase the amount of securities over the 14 million pounds limit, but only to replace banknotes previously issued by a bank ceasing these operations; such a replacement was limited to a maximum of two-thirds of the amount previously issued.
- (5) No new issuer of banknotes would be authorized after the passing of the Act, and issuing rights would be lost by existing banks in case of bankruptcy, amalgamation or issuing discontinuity.
- (6) The Act included a model of the statement of accounts to be published by each department. It also indicated the amount that the Bank was to pay to the Treasury and the rate of gold to the banknotes.

Although the law formalized the practice, the Bank of England had actually started as soon as 1840 to hold separate accounts of the amounts issued against securities and against bullion. During the crises that affected Britain in 1847, 1857 and 1866, the Bank of England was again authorized to issue new banknotes in exchange for securities; however, this facility was only actually used in 1847.

The Bank Act was based on the ideas of the Currency School. An author like Colonel Robert Torrens (1857) or a banker and politician like Lord Overstone (1857) considered that a metallic currency is the ideal system of payment but could be replaced by the less costly circulation of banknotes, provided that the notes would strictly be representative of the metal deposited in the Bank of England. To ensure this condition, they believed that convertibility needed to be upheld by the 1844 Act accounting arrangement, which removed any discretionary intervention in the issuing process. Such an infrastructure would then avert any drifting of the system towards the suspension of payments. According to its defenders, this was the sole objective of the Act, and therefore it was beside the point to criticize it for not preventing financial and economic crises as in 1847.

The Banking School opponents to the Bank Act, like John Fullarton (1845) and

Thomas Tooke (1856), emphasized the diversity of the means of payment, and opposed the Act's view that restricted them to metal and banknotes. They argued that the Bank of England could only control one particular form of money, not the total amount of it, as the latter depended on credit, which is a key variable related to the various costs of production and therefore all the revenues in the economy. This analysis meant that the apparent automaticity brought on by the separation of activities was an illusion, as it actually gave unlimited discretionary powers to the Banking Department. This in turn implied the risk of large fluctuations in the rate of interest and therefore undesirable effects on credit. Convertibility was then viewed by the Banking School as only a way of ensuring that economic agents could switch freely from one instrument of payment to another.

At the time of the Act, the Banking School recommendations seemed to pale in comparison to the reassuring precision of the Act and the apparent automatic working of the Issue Department under the new law. As an alternative, they only offered guidelines concerning the management of interest rates that relied on the discretionary powers of the directors. In this matter, however, the views expressed by Tooke (1856, pp. 129–38) bear a striking resemblance to the modern concept of the “conservative central banker” (see Rogoff, 1985). The Banking School was also vindicated in that if the currency system was able to accompany economic growth during the nineteenth century in the United Kingdom, this was due to the importance of payments not directly related to metallic money or Bank of England notes. In this respect, the key role of scriptural money was entirely unforeseen by the authors of the Act, because amounts on bank accounts were only viewed as deposits of bullion and notes.

The controversy surrounding the 1844 Act might still retain some relevance in modern payment systems. If, as perceived by Tooke (1844, pp. 71–2 and 124), credit and costs of production are the key variables to consider, then the question of the management of money creation must be shifted from the central bank to commercial banks. This then implies investigating whether it would make sense to look at some sort of separation in banking activities (see Rossi, 2013).

XAVIER BRADLEY

See also:

Banking and Currency Schools; Bank money; Bank of England; Bullionist debates; Financial crisis; Metallism; Narrow banking; Settlement system.

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Bank capital and the new credit multiplier

The ongoing debate on the money supply process (the relationship between bank loans and bank deposits) has recently been enriched by introducing the importance of equity capital (see Lavoie, 2003; Karagiannis et al., 2011, 2012). The importance of bank equity for bank (loans) expansion and consequently for financial stability was first identified by the Basel Committee in 1988, then by Basel II agreements (2006) and more recently by the Basel III (2011) capital requirements framework.

The reason for studying the linkages between bank equity and bank lending lies mainly in its possible importance as an alternative monetary policy vehicle. This issue emerged as a by-product of the liberalization process of the banking industry around the world, which induced a lending boom–bust cycle and had to be restricted for financial stability reasons (Goodhart et al., 2004), as well as adding to banks' insolvency risks. Consequently, the Basel Committee issued a number of directives for G10 banks (Basel Committee on Banking Supervision, 1998) that had two supplementary aims: first, to specify the different categories of collateral attached to different bank loans, actually calculating the “net” exposure; and, second, to attribute the appropriate weight to these (collaterally adjusted) exposures.

These directives aimed at reinforcing the Capital Adequacy Ratios (CARs) imposed on the banking sector. However, some years later, the Basel Committee was compelled to issue revised directives (see Basel Committee on Banking Supervision, 2006) in order to describe bank exposures in more detail; these directives were further revised more recently (see Basel Committee on Banking Supervision, 2011).

The CAR regulation follows the Basel II and III mandates, in order to determine the banks' actual loan exposure (for instance, equity must be at least equal to 8 per cent of the bank's loans). CAR is used by the central bank to control the supply of bank loans. Further, monetary authorities have the choice of changing either the CAR percentage or the equity definitions (Tier I, Tier II, and so on). Consequently, CARs act as the “new” credit multiplier and follow the orthodox school of economic thought, which argues that “liabilities create assets” in the banking system. In a way, this new multiplier undermines the traditional role of minimum reserve requirements.

Post-Keynesians, however, have argued that the emergence of this “new” multiplier should be perceived in reverse; that is to say, equity is the result of bank lending. If loans are performing and generate profits, then equity (retained earnings) will be generated, too. According to this alternative view, in the banking sector “assets create liabilities”.

When banks' profitability becomes marginal or huge losses are reported (such as in the global financial crisis that burst in 2008), a shortage of equity will occur. As a result, this response of the central bank and the (fiscal) authorities, in order to provide the necessary equity to banks, becomes vital for the survival of the banking sector as a whole. In this case, the central bank functions as a “lender of last resort” in terms of bank capital provision.

Economists argue that the willingness and effectiveness of such monetary policy reactions are of utmost importance, as they can, in theory, affect the direction of the flow in the “new” multiplier. As such, there are theoretically three alternative outcomes regarding the equity's multiplier direction:

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- (1) First, banks' equity may determine the banking book portfolio (loans). If this causal relationship is accepted, then the equity's multiplier is operative and in line with the mainstream approach.
- (2) Second, if the banking book portfolio (loans) causes equity, then the equity multiplier is operative, but in reverse. In this case, "banks extend credit, creating deposits in the process, and look for the reserves [now equity] later" (Holmes, 1969, p. 73). As a result, the post-Keynesian horizontalist view prevails in the money supply process.
- (3) Third, one can assume that there is a two-way relationship between bank equity and the banking book portfolio. If this hypothesis is verified, then equity "causes" loan expansion and, at the same time, loans create equity. A possible feedback relationship between bank loans and bank equity lies within the structuralists' framework of analysis.

Overall, the importance of bank equity in the bank lending process signifies a new form of credit multiplier in monetary theory. In a way, this new multiplier undermines the traditional role of minimum reserve requirements. Further, the operational capability of this "new policy vehicle" is not given. It mostly depends on the way it intervenes in the financial system, thus raising a crucial question: is banks' equity capital exogenously determined by monetary authorities, is it credit driven and generated by banking profit, or is it a structural product of both forces? The answer to this question links directly to the traditional dispute between neoclassical and post-Keynesian views on the "nature" of the money supply process.

YANNIS PANAGOPOULOS AND ARISTOTELIS SPILIOTIS

See also:

Bank deposits; Basel Agreements; Capital requirements; Collateral; Financial instability; Lender of last resort; Money and credit; Money multiplier; Money supply; Reserve requirements.

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Bank deposit insurance

Bank deposit insurance (BDI) is part of a financial safety net to ensure against financial instability. In general, BDI was implemented to prevent bank runs as well as to avoid generalized banking crises. BDI operates as a lender-of-last-resort measure to insure 100 per cent bank deposits from losses caused by bank failures. In particular and in practice, BDI can close a bank with less social hardship and less consequential political commotion (Goodhart, 2008). In most cases BDI is government-run, but in some cases BDI can be completely private or can combine a public and a private guarantee.

There exist two types of BDI: statutory and implicit. Statutory coverage occurs when the BDI insures deposit balances up to a pre-established amount (Konstas, 2006). In the United States, for instance, the Federal Deposit Insurance Corporation (FDIC), instituted in 1933, covers deposits up to 250,000 US dollars. In the case of Europe, the Deposit Guarantee Schemes (DGS), established in 1994, covers deposits up to 100,000 euros. An implicit protection occurs when regulators aim to resolve bank failures at no loss to the depositors, or when banks that are “too big to fail” become insolvent and are not allowed to fail.

When financial instability rises, the agency responsible for administering BDI accepts liabilities either by guaranteeing some assets or by infusing cash in exchange for troubled assets; it recapitalizes the failing banks, and provides loans for extended periods to avoid a bank failure and/or financial crises. In the case of the United States, the Treasury maintains, through the FDIC, a fund to cover the losses of the guaranteed deposits to pay them all, even if the amount surpasses the insured limit (Wray, 2013).

Since the government, through the BDI, assumes all the default risk, banks get to borrow money at the risk-free interest rate. Some may ask whether this creates moral hazard, as low-cost funding provides a competitive advantage, facilitates oligopolistic behaviour, and encourages greater risk-taking. This is the main argument against deposit insurance covering all types of bank deposits, particularly those deposits that may be related to speculation or associated with much risk that may imply a great fiscal cost. Some scholars, such as Rossi (2010), argue that this problem emerges from ignoring the banks’ book-entry structure and the types of banks’ operations it records, namely income-transferring or income-generating operations. The lack of distinction between these two operations in banks’ book-keeping eventually prevents BDI from operating adequately. On the other hand, authors like Minsky (1986 [2008]) and Kregel (2013) argue that moral hazard or risk-taking is difficult to avoid because banks hold two types of deposits: deposits from customers wishing to hold currency and coins, and deposit accounts created by bank loans that involve the purchase of the liabilities of the private sector in exchange for the creation of a deposit account. Both types of deposits are conflated. Although the second kind of deposits is the one that incurs moral hazard, it is very difficult to identify owing to its nature.

Finally, deposit insurance schemes require the support of a strong central bank in order to meet their commitments (Minsky, 1986 [2008]). Yet the question is, who should bear the cost of rescuing a failing bank when it is responsible for assuming too much risk? The debate is still open.

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See also:

Bank deposits; Bank run; Financial crisis; Financial instability; Lender of last resort; Systemically important financial institutions.

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Bank deposits

For the majority of economists, bank deposits are the form in which money is stored on the liabilities side of banks’ balance sheets. Depending on the contractual agreement with the bank, the ownership of bank deposits grants its holder the right to transfer funds to another account, withdraw cash, or make a payment. This last point is made possible because the purchasing power contained in bank deposits conveys to its owner the ability to appropriate part of economic output.

All monetary aggregates held by the public, minus banknotes and coins, are stored in the form of bank deposits in commercial banks’ ledgers. Monetary aggregates therefore differ in their degree of liquidity, but share a common form as bank deposits. While historically bank deposits took the form of ink on paper, modern banks keep track of their customers’ balances with entirely computerized solutions, reducing the physical properties of bank deposits to electronic impulses. The recent development of more efficient payment and settlement systems both within and between countries has helped to reduce transaction costs and settlement risks substantially.

While income is stored in the form of bank deposits, not all bank deposits contain income. Saving, which is income that is not consumed, is the difference between Gross Domestic Product (GDP) and consumption. According to national income accounting, the total value of goods and services is identical to the income generated within a period of time. From this it directly follows that only those bank deposits that are created alongside production of new economic output contain money income. The amount of bank deposits usually greatly exceeds the amount of saving at any given point in time. As of today, however, there is no way for banks or their customers to know which bank deposits contain income.

On which side of the bank’s balance sheet must a bank deposit be recorded in order to represent money? While most economists only consider deposits on the liabilities side as money, not everybody shares this restriction in theory and practice. For example, the glossary of the Organisation for Economic Co-operation and Development (2013, Internet) states that monetary aggregates “may be taken from either side [of the balance sheet] (since credit series, which are banking assets, are sometimes labelled monetary

Table 1 The creation of new deposits in a bank's book

Bank	
Assets	Liabilities
Loans L £x	Deposits D £x

Source: Lavoie (2003, p. 507).

aggregates) but are normally taken from the liabilities side". The controversy over this question is rooted in the deeper controversy over the creation of new bank deposits, which has concerned economists since Cannan's (1921) and Crick's (1927) articles on the meaning and genesis of bank deposits. Table 1 illustrates how new deposits are created.

In order to avoid assuming the pre-existence of the very phenomenon economists want to explain, any analysis of the creation of new bank deposits must start from *tabula rasa* – that is, from a situation in which neither bank deposits nor cash already exist. As is made clear in Table 1, "the additional loan which is awarded to the borrower has an immediate counterpart in the liabilities of the bank, by the creation of an equivalent additional deposit" (Lavoie, 2003, p. 508). The notion that loans – recorded on the assets side of the bank's ledger – create deposits – recorded on the liabilities side of the bank's ledger – has been asserted by a large number of economists in history (Withers, 1909; Cannan, 1921; Tobin, 1963; Kaldor and Trevithick, 1981; Borio, 2012) and is a central theme of post-Keynesian economics and, more generally, the endogenous money approach in monetary theory.

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See also:

Bank deposit insurance; Bank money; Cash; Endogenous money; Monetary aggregates; Settlement system.

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Banking and Currency Schools

The debates between the Banking School and the Currency School are of central importance in considering the role of money and banks in a capitalist system. They can be connected with the bullion controversy of the early nineteenth century, whose main protagonists were Henry Thornton and David Ricardo, and are also linked to the financial revolution parallel with, and a necessary complement to, the industrial revolution in Great Britain (Cameron, 1967).

The debates focused on two central themes: (i) the criteria to adopt with respect to money emission; and (ii) the extent of the Bank of England's power. The crises characterizing the first half of the nineteenth century (1825–26, 1836, 1839) largely conditioned attitudes, leading to much criticism against the Bank of England.

The Currency School was anchored in Ricardo's theory that the quantity of money in circulation should be limited according to precise rules. Torrens (1837) and Overstone (1857) also assumed this position, adopting the quantity theory of money and the price–specie flow mechanism and underwriting a definition of money that included, besides metal-based money, banknotes issued by the Bank of England and by other banks. The task of the Bank of England was thus to control the quantity of money in circulation in order to ensure that prices remained stable.

The Peel Act of July 1844 represented a significant moment in the debate on monetary issue, endorsing the positions of the Currency School. The Bank of England, which was granted a monopoly in monetary issue, was divided into two departments, according to a model similar to that adopted by the Swedish Riksbank: monetary issue was assigned to the Issue Department, while the Banking Department carried out the functions traditionally allotted to commercial banks.

Proponents of the Banking School were highly critical of this reorganization, and its supporters (Tooke, Gilbart, Wilson and Fullarton) rejected the quantity-theory-of-money approach of the Currency School. In their *History of Prices*, Tooke and Newmarch (1838–57) pointed out that variation in prices was not caused by variation in the quantity of money in circulation but rather by elements affecting production costs or goods supply. The authors underlined the endogenous nature of money supply and suggested, as an alternative, a wider definition of money, to include also the units issued by banks and by private individuals. Further, according to Tooke and Newmarch (1838–57), Tooke (1844) and Fullarton (1845), the “law of reflux” insured against the risk of over-emission, avoiding the danger of inflation.

In reply to the observation of the Banking School that banknotes were always issued by the central bank in order to satisfy commercial needs (in which case an effective over-issue of paper money had no reason to occur), the supporters of the Currency School denied the analytical relevance of the term “commercial needs”, because in their opinion these needs were subject to change with every variation in the rate of interest.

The debate between the Currency School and the Banking School represented a prelude to more recent discussions on the monetary nature of a capitalist economy. While the former School anticipated the monetarist theories in some ways, the more or less recent developments of the Keynesian tradition appear closer to the latter.

Following the Currency School, Friedman (1968, 1987) considered money supply an exogenous dimension, controlled by the central bank to avoid inflation. Post-Keynesian

thinking (since the Radcliffe Report (1959) and the contributions of Kaldor (1970, 1982) and Kaldor and Trevithick (1981)) have, rather, underlined the endogenous nature of money supply: money is credit driven and demand determined. As for the Banking School, the law of reflux prevents over-issue of money.

Unlike those who (see Kindleberger, 1978) underline its relevance today, Blaug (1968) attributed little importance of that controversy to present questions on the grounds that neither of the Schools was able to recognize the essential functions of a central bank. This conclusion does not appear convincing, however.

Contrary to Blaug's (1968) argument, the contributions of the Banking School and the Currency School still have considerable relevance today, especially in light of the global economic and financial crisis that erupted in 2008. The theoretical considerations concerning the monetary field formulated over the last few decades have emphasized that it is no longer possible to disregard the endogenous nature of money supply, and that it is necessary to define the role and the responsibilities of the banking system (see Figuera, 2001).

STEFANO FIGUERA

See also:

Bank Act of 1844; Bank of England; Bullionist debates; Endogenous money; Inflation; Monetarism; Money creation; Money supply; Quantity theory of money; Reflux mechanism; Ricardo, David; Thornton, Henry.

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Banking supervision

Banking supervision involves the monitoring of the banking sector to assess that each of its members complies with the existing regulation. Supervisory and regulatory issues are therefore tightly connected. With the global financial crisis that erupted in 2008, their

joint contribution to financial stability has been reasserted as part of the corrections and policy reforms to be carried out for the prevention of financial instability. This is consistent with the widely accepted view according to which “the *vulnerabilities* [which originated the crisis] were the structural, and more fundamental, weaknesses in the financial system and in regulation and supervision that served to propagate and amplify the initial shocks” (Bernanke, 2012, p. 2). While closer supervision of all banks is deemed necessary, systemically important banks (SIBs) require “greater intensity of supervision and hence resources” (Basel Committee on Banking Supervision, 2012, p. 5).

On-site supervision of banks is combined with off-site supervision, the proportion being “determined by the particular conditions and circumstances of the country and the bank” (*ibid.*, p. 30). In order to assess the safety of banks, as well as potential risks, and to identify “corrective actions and supervisory actions” (*ibid.*, p. 31), the information used by the supervisors may include prudential reports, statistical returns, information on a bank’s related entities, and publicly available information (*ibid.*). Supervisory tools include analyses of financial statements and accounts, business model analyses, horizontal peer reviews, reviews of the outcome of stress tests undertaken by the bank, and analyses of corporate governance, including risk management and internal control systems (*ibid.*).

The global financial crisis resulted in an institutional rearrangement of banking supervision, with two trends emerging, and deriving from political traditions, as well as legal and constitutional constraints (Nier et al., 2011, pp. 34–6). In advanced economies, several countries are “integrating prudential supervision into the central bank” (*ibid.*, p. 9). An example of this is provided by the United Kingdom, with the creation of a Financial Policy Committee within the Bank of England and the establishment of a Prudential Regulatory Authority as a Bank of England subsidiary (Eichengreen and Dincer, 2011, p. 3). This is also the case with a number of national central banks within the euro area, such as Ireland, while at a supranational level the European Central Bank is assigned specific supervisory tasks through the establishment of a single supervisory mechanism, to be enforced in late 2014 (Council of the European Union, 2013; Micossi, 2013). The United States differs from this pattern, insofar as the federal government chairs the Financial Stability Oversight Council (FSOC), which functions separately from the Federal Reserve (Nier et al., 2011, p. 10), although the latter has been granted extended supervisory responsibility in accordance with the Dodd–Frank Act of 2010. In emerging economies, the reform has consisted in leaving the degree of integration unchanged, and establishing a new committee with macroprudential policy responsibilities, either chaired by the government, as in Turkey, or by the central bank governor, as in Thailand (*ibid.*).

Central bank involvement in supervision brings a positive effect through information gains (Dalla Pellegrina et al., 2010), especially in the macro supervision area (Blinder, 2010, p. 132), where complementarities between monetary policy and supervision are likely to be stronger (Blinder, 2010, p. 131). It may nevertheless entail several adverse effects, namely a moral hazard effect, a reputation effect, a bureaucracy effect and a conflict of interests effect (Masciandaro and Quintyn, 2009, p. 6). It may also be argued, however, that “[t]he central bank is probably best-positioned to balance the two competing objectives, rather than leaving them in the hands of two independent agencies” (Blinder, 2010, p. 132).

A political argument may also be put forward: increased supervisory powers, especially over systemically important financial institutions, “would push the central bank deeper into the realm of politics – which could, as a consequence, politicize monetary policy” (ibid., p.131). Indeed, increased central bank involvement in supervision “can affect central bank independence via both the inflationary and financial distributional effects of bank bailout financing” (Masciandaro and Passarelli, 2013, p. 3). Further, with this phenomenon, “the stability of its independence will [increasingly] depend on how its choices affect the distribution of income and wealth through two channels – nominal and financial effects” (ibid.).

The role of internationally active institutions and cross-border banks during the global financial crisis revealed the insufficiency of national supervision and the necessity of cooperation between supervisors (Beck and Wagner, 2013), whereby, for instance, countries might agree on a minimum intervention threshold, which would allow “partial internationalization of the [cross-border] externalities” and “a tailoring of intervention policies to domestic heterogeneity” (ibid.).

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See also:

Credibility and reputation; Financial crisis; Financial instability; Macro-prudential policies; Macro-prudential tools; Systemically important financial institutions.

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Bank money

Bank money is a liability issued by banks and is sometimes also referred to as credit-money. According to Keynes (1930 [1971], p.5) bank money “is simply an acknowledgment of private debt, expressed in the money of account, which is used by passing from one hand to another, alternatively with money proper, to settle a transaction”.

Chartalists such as Wray (1998) distinguish between state money and bank money. In this view, state money is exogenously created by the state in the form of central bank and treasury liabilities. Bank money is a multiple of state money, recorded on the liabilities side of commercial banks’ balance sheets. Chartalists assume that the treasury and the central bank can be considered as one entity from an economic point of view (Wray, 2003, p.87). Gnos and Rochon (2002, p.48) disagree, pointing out that “if the Fed is the treasury’s bank, then the Fed becomes a central bank *vis-à-vis* the treasury as well as *vis-à-vis* private banks, the latter role consisting in converting monies into one another and thus allowing banks to meet their reciprocal liabilities”. Additionally, chartalists believe “the [US] government can buy anything that is for sale for dollars merely by issuing dollars” (Wray, 1998, p.ix). But neither central banks nor treasury departments can finally purchase anything by incurring a debt. Instead, every final purchase of the treasury or the central bank must be financed with income sooner or later. It is therefore more realistic to suggest that all modern money is (central or commercial) bank money.

We may follow Keynes by restating that bank money is a bank’s acknowledgment of debt (AoD). How can a bank’s AoD serve as an instrument to discharge debt between non-banks? We can depict the payment mechanism by referring to Rossi’s (2007, p.37) graphic illustration of a payment on the labour market (Figure 1).

Through the use of double-entry bookkeeping, a bank extends to a firm its AoD (+£x) once it carries out the firm’s payment order. The firm instantaneously passes on the bank’s AoD (−£x) to the benefit of the worker (+£x), thereby discharging the

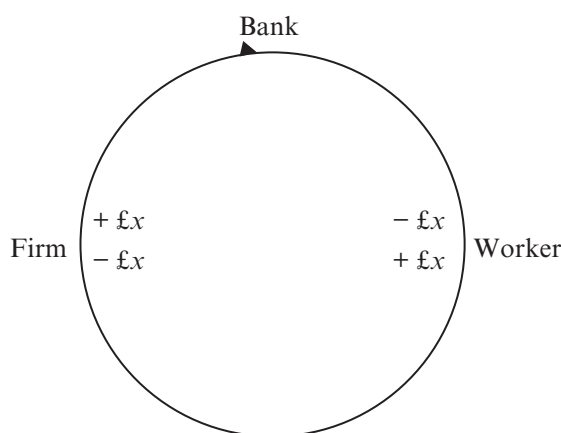


Figure 1 *The emission of money as a flow on the labour market*

outstanding debt between firm and worker. The bank's AoD immediately flows back ($-\pounds x$) to the bank as the worker purchases a financial asset in the form of the bank deposit that makes up his wage bill. As a result of this flow of bank money, the worker becomes the owner of an income deposited in the bank, and the firm is indebted to the bank (see Cencini, 2010, p. 48).

Accordingly, we can make the following four observations. First, we notice the means-of-payment function of bank money. The debt between the firm and the worker could not have been discharged with the firm's own AoD, in which case the payment would simply have been postponed. Precisely because the issuing bank is neither a seller nor a purchaser in this transaction, its AoD can serve as a means of payment between payer and payee. Second, owing to its numerical nature, bank money acts as a unit of account. By issuing a number of money units every time a payment is carried out, bank money measures and thereby homogenizes economic output. Third, Figure 1 also allows a distinction between production and emission. While economic production is a time-intensive process involving the employment of the factors of production, the emission of bank money is an accounting operation that lasts an instant from a logical point of view. Production gives rise to new output and the corresponding purchasing power in the form of income. The emission of nominal bank money, however, simply gives rise to a double entry in banks' books. Therefore, bank money measures output, but is itself a valueless and numerical vehicle. Finally, Figure 1 illustrates that bank money is neither a net asset nor a net liability. When a payment is carried out, both the payer and the payee are credited ($+\pounds x$) and debited ($-\pounds x$) by the bank within the same impulse. "Being a unit of account, money is neither a net asset nor a net liability, but simultaneously an asset *and* a liability whose function is that of 'counting' the object of economic transactions" (Cencini, 1995, p. 13, *italics in the original*). This means that money cannot be considered an asset at a macroeconomic level, as it is both an asset and a liability at the same time (see Schmitt, 1975, p. 13).

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See also:

Bank deposits; Central bank money; Chartalism; Money and credit; Quantum macro-economics; State money.

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Bank of Canada

The Bank of Canada has received many accolades in recent years because of its handling of the financial crisis, especially owing to the popularity of its governor at the time, Mark Carney, who was also appointed chairman of the G20's Financial Stability Board in 2011 and then, in 2013, he became Governor of the Bank of England. As far as central banking internationally is concerned, the Bank of Canada exerts much more prominence among central banks than it would otherwise do when measured simply by the size and importance of the macroeconomy that the Bank oversees through its activities. The Bank of Canada has acquired high credibility also because it has managed a solid and sophisticated banking system, which did not face the same difficulties that plagued the US banking sector during the financial crisis that erupted in 2008.

Much like the US Federal Reserve (Fed), this central bank was founded following major financial crises on the North American continent during the early decades of the twentieth century, namely after the crisis of 1907 for the US Fed and the Great Crash of 1929 for the Bank of Canada (see Lavoie and Seccareccia, 2013). In stark contrast to the Fed, which established a “decentralized” central banking system in 1913 with 12 separate reserve districts, the institutional structure of the Bank of Canada was modelled on the more centralized organization of the Bank of England, with this structure being adapted to the Canadian context following its founding in 1934, for instance in terms of its regional and linguistic representation on its board of directors and governing council. Hence, while first a private institution, the Bank of Canada was quickly nationalized by the federal government within a few years of its creation in 1938 (see Plumptre, 1940; Bank of Canada, 2014).

Unlike the Bank of England, the US Fed, and the European Central Bank, the Bank of Canada does not hold the official status of an “independent” central bank. Though being an arm's-length public institution, with the appointment of the governor of the Bank of Canada exceeding the normal duration of parliament, decisions regarding the direction of monetary policy cannot be pursued at variance with the views of the democratically elected government in power. To assure this communication link between the government and the Bank of Canada, the Deputy Minister of Finance sits as *ex officio* member of the board of directors of the Bank of Canada. Often referred to as the Coyne affair, this political “dependence” of the Bank of Canada was once put to the test in 1961, when a conflict had erupted between the Minister of Finance and the Governor, with the latter being eventually pressured to resign. This ultimate power over Bank policy was (and must still be) exercised, however, within the broad framework of its mandate as set out in the preamble to the Bank of Canada Act of 1934, which, for instance, despite the Bank's official commitment to inflation targeting since February 1991, actually remains a multi-faceted mandate, namely “to regulate credit and currency [. . .] and to mitigate by its influence fluctuations in the general level of production, trade, prices and employment” (Government of Canada, 2014, p. 1), which is a mandate that has remained unchanged over the past 80 years.

Much like other national central banks, the Bank of Canada is the sovereign issuer of Canada's currency. It is the ultimate dispenser of liquidity to the commercial banks, and it manages the interbank market for funds through its targeting of the overnight rate of interest, the key lending rate in the economy, via a corridor system of interest rate setting.

At the same time, it is the fiscal agent of the federal government, by managing the market for federal government securities. Historically, it has also intervened in foreign exchange markets in order to influence the exchange rate of the Canadian dollar, even though it has not officially intervened since 1998, thereby making the Canadian dollar exchange rate a pure float.

The Bank of Canada's interventions throughout its history took place within policy frameworks that varied as successive competing schools of thought in monetary theory became fashionable. For instance, during the Second World War and during the early post-war years, the Bank of Canada pegged interest rates at very low levels that supported the war effort and post-war growth by accommodating public spending largely within a Keynesian frame of reference. However, once central banks internationally began to free up interest rates by engaging in discretionary interest rate policy, the Bank of Canada began to focus on combating inflation as its principal goal. The most important change in policy direction took place in the mid 1970s immediately after the first oil price shock, when the Bank of Canada adopted a hybrid monetarist framework dubbed "monetary gradualism" by targeting the growth of a narrow monetary aggregate, namely M1. The Bank's incapacity to meet its M1 target by the early 1980s brought the monetary authorities to abandon altogether the monetarist framework in 1982 (see Lavoie and Seccareccia, 2006).

After a short interlude of policy drift in the 1980s, by the early 1990s the Bank of Canada had adopted a new monetary policy framework along Wicksellian lines. This entailed a precise institutional structure whereby the operating target would be the overnight rate of interest and where the goal would be an officially-approved inflation target, which the government would renew every five years. Similar to other inflation-targeting central banks, until the global financial crisis of 2008–09 the Bank of Canada targeted a 2 per cent core inflation rate compatible with a positive real overnight rate of interest.

During the financial crisis that burst in 2008, it can be said that, although never abandoning officially its inflation target, the Bank of Canada pegged its administered interest rate at practically zero level, which engendered a negative overnight rate of interest, in the hope that the latter would provide sufficient boost and would complement the fiscal stimulus that had been introduced by the federal government to combat the recession. It also introduced quantitative easing in what has been argued by some as a futile attempt to encourage banks to lend via a supply-side policy measure (see Lavoie and Seccareccia, 2013). Towards the end of 2010, the Bank of Canada reverted back to a semblance of discretionary interest rate policy, but with the persistence of a negative real overnight rate of interest, which, since then, has attested to the fears and reality of secular stagnation.

MARIO SECCARECCIA

See also:

Bank of England; Carney, Mark; Central bank as fiscal agent of the Treasury; Central bank credibility; Corridor and floor systems; Credibility and reputation; Federal Reserve System; Financial crisis; Inflation targeting; Interest rates setting; Monetary aggregates; Monetary targeting; Negative rate of interest; Quantitative easing; Wicksell, Knut; Zero interest-rate policy.

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Bank of England

The Bank of England (BoE) was founded in 1694 as the government's banker and debt manager. There have been a number of key moments in the BoE's history. In 1781 the renewal of its charter was described as "the public exchequer". The 1844 Bank Charter Act gave the BoE the sole monetary authority in the United Kingdom and tied its note issue to the BoE's gold reserves. Later in the nineteenth century the BoE took on the role of lender of last resort. In 1946 the BoE was nationalized and remained the HM Treasury's adviser, agent, and debt manager. Operational independence was granted to the BoE in May 1997, whereby it undertook the responsibility of monetary policy while public debt management was transferred to HM Treasury and its regulatory functions were passed to the then newly established Financial Services Authority (FSA). The Financial Services Act of 2012 created new regulatory reforms for the BoE whereby an independent prudential regulator was established, the Financial Policy Committee (FPC), as a subsidiary of the Bank. The Prudential Regulatory Authority (PRA) was also created and is responsible for the prudential regulation and supervision of banks, building societies, insurers, and major investment firms. The reforms came into effect on 1 April 2013, with the FSA becoming the two separate regulatory authorities just mentioned.

In September 1992 the UK was forced out of the European Exchange Rate Mechanism. In October 1992 an inflation targeting regime was introduced. In May 1997 that regime was changed to a new one, which was more in line with the policy implications of what has come to be known as the New Consensus Macroeconomics (see, for example, Arestis, 2007). I explain the two regimes in what follows, before I turn to more recent developments as a result of the August 2007 subprime crisis and the Great Recession that followed.

The 1992–97 inflation targeting regime had the following characteristics: (i) 1–4 per cent inflation target; (ii) regular meetings between the Chancellor of the Exchequer and the Governor of the BoE to decide the level of the rate of interest; (iii) publication of the minutes of those meetings began in 1995; and (iv) an *Inflation Report* began to be published annually in 1993. There were disagreements between the Chancellor and the Governor of the BoE, which affected the credibility of the scheme.

In May 1997 the BoE became independent with operational responsibility given to its Monetary Policy Committee (MPC). The inflation target was set at 2.5 per cent, with a 1 per cent tolerance range of the Retail Price Index excluding mortgage interest payments (the so called RPIX). It was changed to the Harmonized Index of Consumer Prices

(HICP) at 2 per cent, with a 1 per cent tolerance range, in October 2003. RPIX excludes mortgage interest payments, but includes council taxes and other housing costs. The inflation target is symmetrical; that is, deviations below the target are treated in the same way as deviations above the target. The MPC meets at least once per month to set the rate of interest (and six times a year to set research priorities). The objective of inflation targeting is price stability; not an end in itself but to help government in its objectives that include growth and employment. The rationale for inflation targeting is that inflation is a monetary phenomenon, and as such inflation should be controlled through the rate of interest. Credibility is attained through pre-commitment to the inflation target without government interference. The idea behind inflation targeting is that it is a constrained-discretion type of policy: it is based neither on pure discretion nor on rules.

The membership of the MPC is as follows: Governor and two Deputy Governors of the BoE; two BoE members (appointed by the Governor of the BoE in consultation with the Chancellor of the Exchequer); four external members (appointed by the Chancellor of the Exchequer); and one Treasury representative who attends and speaks but has no right to vote. The Treasury representative sits at the MPC meetings. An important dimension of the inflation-targeting set-up of the BoE is the letter to the Chancellor, which the Governor of the BoE would have to write when the inflation target is not met. The Governor's letter to the Chancellor should explain: the reasons why actual inflation is far away from the target; the policy action to deal with it; the period in which inflation is expected to return to target; and how this approach meets the Government's objectives for growth and employment. A second letter is required if, more than three months after the first letter, inflation remains 1 per cent above or below the inflation target. Such an open letter does not necessarily imply a sign of failure.

The MPC is accountable to Parliament, and scrutiny is exercised by a Treasury Committee and the House of Lords Select Committee. However, the government retains overall responsibility for monetary policy: the government is responsible for designing the framework and for setting the inflation target; and once the inflation target is set, it becomes primarily a technical issue as to what level of interest rates is appropriate to meet the target. The MPC is responsible for setting the appropriate interest rate to meet the set inflation target.

The interesting question is whether UK inflation targeting has been successful. Figures for the rate of inflation between October 1992 and August 2007 (before the global financial crisis emerged and the inflation targeting regime was changed as I explain below) support the view that it has been. However, a number of problems exist, as argued by Angeriz and Arestis (2007): actual inflation rates were below the mid-point target, implying tight monetary policy; insufficient attention was paid to the exchange rate; countries that do not have an inflation targeting regime have done as well as the United Kingdom; monetary policy should be concerned with asset price targeting; and the transmission mechanism of monetary policy has changed.

With the Great Recession emerging, the MPC reduced the rate of interest substantially and designed new policies, essentially injecting massive liquidity into the system. The MPC reduced the policy interest rate six times beginning in October 2008 to an all-time low of 0.5 per cent in March 2009 – where it is at the time of writing. A new Banking Act came into force in late February 2009, giving greater powers of intervention to the BoE. The purpose of this Act is for the BoE to be able to give support to stricken banks

for financial stability objectives. Most importantly, under the New Banking Act there is a new and permanent provision, the Special Resolution Regime, that for the first time gives the BoE the statutory objective to promote domestic financial stability. Also the introduction of the Asset Purchase Facility (19 January 2009), a framework that enables the MPC to initiate Quantitative Easing (QE), was implemented on 5 March 2009. The ultimate objective of QE is to influence the set inflation target. This is to be achieved via the output gap, influenced by changes in the money supply with its impact on current output, since the BoE interest rate is close to zero. The impact on the output gap and on inflation expectations will achieve the set inflation target.

There are doubts about the effectiveness of QE but one advantage is clear: QE made it easier for the government in its fiscal policy, because it provided a ready buyer for government debt. Without QE there would have been difficulties, which may have forced the UK government to contain further the degree of its fiscal initiative.

Even more recently the new Governor of the BoE has initiated a new strategy, called “forward guidance”. This amounts to explicit guidance in terms of the future conduct of monetary policy: the MPC will not consider raising the policy rate of interest before the unemployment rate has fallen to 7 per cent or below. However, this strategy could be put aside, if inflation exceeds the 2.5 per cent target over the medium run. It is also possible for the BoE to undertake more QE, if additional monetary stimulus is warranted.

PHILIP ARESTIS

See also:

Banking supervision; Central bank independence; Consumer price indices; Financial crisis; Financial instability; Forward guidance; Inflation measurement; Inflation targeting; Lender of last resort; Money supply; Output gap; Quantitative easing; Rules versus discretion; Zero interest-rate policy.

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Bank of Italy

The Bank of Italy is the central bank of the Italian Republic, instituted in 1893. The origins and the evolution of the Italian monetary system are, in several respects, peculiar. After national unification in 1861, Italy adopted a single currency, the Italian lira. Nevertheless, banknote circulation was fragmented owing to the persistence of strong regional interests (Polsi, 1993): a provision of 1874 recognized six banks of issue, all of which were already performing this function in the pre-unification states.

The resumption of convertibility in 1883 and the building boom triggered by the new national capital, Rome, kindled a large credit expansion, which inflated a real-estate bubble. Most major banks were engaged in generous credit to the building sector, favored by the regulatory *vacuum* in which they operated (see Fratianni and Spinelli, 1997). The burst of the bubble resulted in a banking crisis, which erupted into a true political and

judicial scandal in 1892, when the unsustainable position of Italian banks of issue, and evidence of serious irregularities committed by one of them, the Roman Bank, became public. The scandal highlighted the need to put a limit on banknote issues and to foster the transition towards a single bank of issue (De Cecco, 1990). The Bank of Italy was then instituted by the Banking Law of 10 August 1893 through the merger of three existing banks of issue: the National Bank of the Italian Kingdom, the Tuscan National Bank, and the Tuscan Credit Bank.

In the first post-war period, within the monetary stabilization plan launched by the fascist government (1926–29), several major reforms triggered the transition of the Bank of Italy from a “bank of issue” to a true central bank. This culminated, after the turmoil of the Great Depression and the 1931–33 Italian banking crisis, in the 1936 new Banking Law. The first part of this provision, still in force, defined the Bank of Italy as “a public law institution”, redefined its equity structure, and entrusted it with several new regulatory tools reinforcing its function of “banker to banks”.

While in the immediate aftermath of the Second World War Italy was engaged in a severe struggle to tame the runaway inflation, the 1950s were characterized by sustained growth in a context of monetary stability (Cotula, 1998–2000). Nevertheless, by the end of the 1960s the situation was completely reversed. The Italian monetary system began to falter under the pressure of the first oil crisis and the collapse of the Bretton Woods regime, and throughout the 1970s suffered tremendously from the “stagflation” phenomenon.

Despite the fact that in 1978 Italy joined the European Monetary System, inflation rates were significantly higher than the average rate of inflation of industrial countries. The persistence of high inflation rates in Italy, being imputed to excessive public spending, provided a strong support in favor of the independence of the central banking function (Ciampi, 2011). In 1981, the “divorce” with the Treasury was therefore carried out, and the Bank of Italy was given full autonomy to decide whether or not to purchase Treasury bills not bought by brokers at auctions.

The 1980s were also characterized by the transition from “structural” to “prudential” supervision at the Bank of Italy, which set the stage for the deregulation process of the banking sector. Liberalizations and privatizations, supervised by the Bank of Italy, went hand in hand with the European process of economic integration, which reached its climax in 1992, when the Treaty of Maastricht was signed. The requirements to be admitted in the European System of Central Banks (ESCB) resulted in a further reinforcement of the Bank of Italy’s autonomy: in 1992, the fully independent power to set official interest rates was established; by the end of that year a further provision prohibited the State from financing itself by current account overdrafts with the Bank of Italy. The launch of the European single currency in 1999 marked the definitive incorporation of the Bank of Italy into the ESCB.

In 2005, a new law on the protection of savings and the regulation of financial markets modified the organization and institutional structure of the Bank of Italy, and in 2006 a new statute was approved, which repealed the constraint on the subjects allowed to participate in its capital as well as the legal obligation to maintain public control of the Bank of Italy, which was never applied in fact. The share distribution has remained essentially unchanged since 1948, the only variations being due to bank mergers and acquisitions. Since 2005, the complete list of shareholders is available on the Bank of Italy’s website.

The current functions of the Bank of Italy are defined by European Union law, within the framework of the ESCB, and by a number of national provisions addressing its oversight powers and its relationships with the Treasury and other national authorities.

Within the Eurosystem, the Bank of Italy contributes to monetary policy decisions through the participation of its Governor in the Governing Council of the European Central Bank (ECB) and of its experts in the Eurosystem committees and working groups. The Bank of Italy is then responsible for implementing these decisions in Italy through operations with domestic credit institutions, open market operations, standing facilities, and the management of required reserves. It may carry out foreign exchange operations in accordance with the rules laid down by the Eurosystem. It manages Italy's foreign exchange reserves and a part of those of the ECB on the latter's behalf. It is responsible for producing the quantity of euro banknotes established by the Eurosystem, managing the currency in circulation and fighting against forgery.

The Bank of Italy is also in charge of promoting, through its supervisory powers, the soundness and efficiency of the Italian financial system and the smooth functioning of the payment system, while an indirect reference to its functions can be traced in Article 47(1) of the Italian Constitution (1948): "the Republic encourages and protects saving in all its forms, it regulates, coordinates and controls the provision of credit".

ALESSANDRO CAIANI

See also:

Banking supervision; Bank run; Bretton Woods regime; Bubble; Central bank independence; European Central Bank; European monetary union; Financial crisis; Housing bubble; International reserves; Open-market operations; Reserve requirements.

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Bank of Japan

By virtue of the National Bank Act of 1872 (amended in 1876), the Japanese government allowed national banks to issue their own banknotes. The Bank of Japan, established as the central bank in 1882 by the Bank of Japan Act, started issuing its own banknotes in 1885, which were convertible to silver (and later to gold) by the Convertible Bank Note Regulations (1884), at which point national banks lost their ability to issue their own banknotes, although their banknotes continued to be used until 1899. The Bank of Japan was originally under the direction of the Ministry of Finance and therefore had little role in the regulation and supervision of the financial system. In 1897, Japan joined the gold standard, but in the end broke away in 1931. Japan gradually moved to a managed currency system, and in 1941 the specie reserve system was abolished. In 1942, the Bank of Japan Act was revised, but the Bank was still under the Ministry of Finance. The Bank

of Japan Act was drastically amended in June 1997 and was enforced in April 1998 (see Schiffer, 1962; Tamaki, 1995; Cargill et al., 1997; Tsutsui, 1999).

One of the important changes brought about by the latest round of amendments concerned the autonomy of the Bank of Japan and the transparency of its monetary policy and business operations, which were strengthened in the Act of 1997. The Policy Board is the highest decision-making body of the Bank of Japan (one-board system). It is composed of nine members: the Bank of Japan's Governor, two Deputy Governors, and six Members of the Policy Board. The Board members, whose appointment is subject to the consent of the House of Representatives and the House of Councillors, are appointed by the Cabinet for a five-year term of office. In order to make decisions on matters related to monetary policy, the Policy Board holds Monetary Policy Meetings once or twice a month, where proposals are decided by a vote of the nine members of the Policy Board, although government representatives can attend and express opinions, submit proposals concerning monetary control matters and, in addition, request a postponement of a Board vote on a specific proposal. The right of postponement was exercised by government representatives once at the Meeting of August 2000. The announcement of decisions of each Monetary Policy Meeting are released immediately after each meeting, the minutes are released after the next meeting and the transcripts are released ten years after the meeting took place (see Shirakawa, 2008; Umeda, 2011; Institute for Monetary and Economic Studies, 2012).

As regards the policy rates of interest, the Bank of Japan used the official discount rate until 1994. The so-called “unconventional monetary policy” in Japan started, ahead of other countries, in February 1999, when the Bank of Japan set the policy target of zero for the uncollateralized overnight rate of interest in the call market, which was kept at almost zero until August 2000. This zero interest rate policy was adopted again later. The quantitative easing policy started in March 2001 and ended in March 2006, during which period the Bank of Japan set the outstanding balance of current accounts as its policy target (see Shirakawa, 2009; Umeda, 2011; Institute for Monetary and Economic Studies, 2012). The Bank of Japan set a 2 percent inflation target rate in January 2013, and in April 2013 announced the price stability target of 2 percent in terms of the year-on-year rate of change in the consumer price index with a time horizon of about two years (see Kuroda, 2013).

Regarding prudential policy, for risk-based supervision of individual financial institutions, the Bank of Japan has conducted on-site examination of financial institutions, which the Bank had no legal basis to undertake until the Bank of Japan Act (1997) was enforced. For compliance-based supervision by the Banking Act, the Financial Services Agency conducts on-site inspections. As the lender of last resort, the Bank prepares several fund-supplying measures. *Tokuyu* (special loans) is the provision of uncollateralized loans to financial institutions, which the Bank of Japan makes at the request of the government in order to prevent systemic risk from materializing. After World War II, the Bank has provided *Tokuyu* in only two cases in the 1960s, but 17 cases in the 1990s, and six more cases in the early 2000s (see Kumakura, 2008, p. 51). In order to deal with non-performing loan issue in Japan, the Bank of Japan began to purchase stocks from financial institutions in November 2002 (until September 2004, and between February 2009 and April 2010). In October 2010, to ensure financial system stability, the Bank of Japan extended its fund-supplying measures to include the purchase of various financial assets,

such as Japanese government bonds, commercial papers, corporate bonds, exchange-traded funds, and Japanese real estate investment trusts (see Institute for Monetary and Economic Studies, 2012).

TAKASHI YAGI

See also:

Banking supervision; Inflation targeting; Lender of last resort; Quantitative easing; Reserve requirements; Zero interest-rate policy.

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Bank run

A bank run expresses a sudden loss of confidence from depositors towards their bank’s ability to provide liquidity and redeem its customers; it results in a massive and sudden withdrawal of bank deposits and a contraction of available cash stock, which may lead to bankruptcy and a banking crisis. It results from depositors’ fear of not being able to recover their funds. It may involve one or more banks, while banking panic involves several institutions and implies a contagion phenomenon (De Bandt and Hartmann, 2000, p. 263).

Bank runs usually raise questions about the mechanisms of financial crises and the solutions to be implemented. These explanations deal with banks’ internal and external factors (Bordo, 2000, p. 110), such as the structure of banks’ balance sheets, information asymmetries, deposit contracts and the existence of mimetic behaviour (Boyer et al., 2004, p. 102). Thus, a bank run is often discussed in parallel with bank liquidity, banking crises (concerning banks’ assets) and systemic crises. It may be considered as the origin of these crises and a result of financial dysfunctions requiring central banks’ intervention. Seemingly a simple problem of illiquidity, it may become more problematic when it involves a bank failure contagion effect (cascade weakening) and a domino effect (cascaded bank bankruptcies).

Financial economists have been studying the occurrence of bank runs, albeit only from a microeconomic point of view. Diamond and Dybvig (1983) build their financial theory

explicitly on bank runs to justify the “*raison d’être*” of banks. Banks exist because they solve the issue of customers’ liquidity; then they expose themselves to illiquidity and to banking panics, because contracts (deposits) can be challenged and then panic may settle following a self-fulfilling prophecy.

Most of the relevant microeconomic models (single bank or multibank models) attempt to explain the nature of initial shocks (see Gorton, 1985, regarding informational shocks; Mishkin, 1991 and Flannery, 1996, regarding adverse selection shocks), of concerned agents (through the interbank market, see Rochet and Tirole, 1996, or the payment system), and of information involved (see Bhattacharya and Jacklin, 1988). Nevertheless, they hardly explain systemic crises.

The complexity of bank runs is at last considered in some macroeconomic models (Minsky, 1996; Rochet, 2010). It actually involves financial stability and monetary policy, as a part of a broader and systemic phenomenon. This approach pertains to the long-standing tradition of the lender of last resort (LLR). It has showed its relevance again several times since 2008 with Northern Rock or in Cyprus.

Generally speaking, there are four lines of action in a case of panic (Bordo, 2000, p. 111). For Thornton and Bagehot, the LLR provides the necessary cash to solvent banks, it restores confidence by lending cash at a penalty rate of interest and it announces its interventions. According to Goodfriend and King (1988), the LLR intervenes only by increasing the monetary base. Goodhart and Huang (2005) note, however, that the distinction between banks’ insolvency and their illiquidity is difficult to establish and that it is also worth supporting insolvent banks. Finally, for the free-banking school, the market is the only correct answer in a case of panic.

Traditionally, interventions consist in guaranteeing bank deposits and suspending convertibility. These purely microprudential regulatory perspectives have been widely adopted and have shown their limits. Thus, a macroeconomic approach and an advanced theory of money and bank are necessary. As pointed out by De Carvalho (2009, p. 278), the “evidence from the current crisis so far seems to confirm the Post Keynesian view. There was no large shock impacting the financial system.” Central banks are more than ever called upon to provide liquidity both for illiquidity issues and insolvency issues for individual banks and the banking sector as a whole. In order to prevent bank runs and to stabilize the financial system, it seems necessary to control leverage effects, to extend regulation to other financial institutions, to get back to regulation through self-discipline, and finally to regulate financial innovations (De Carvalho, 2009).

VIRGINIE MONVOISIN

See also:

Asymmetric information; Bagehot, Walter; Bank deposits; Cash; Contagion; Financial crisis; Financial innovation; Financial instability; Free banking; Lender of last resort; Sudden stops; Thornton, Henry.

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Banque de France

The Banque de France (BdF) was established in 1800, under the aegis of bankers and Napoleon Bonaparte, who was then First Consul of France. At that time, a few prominent bankers were advocating the creation of a private bank of issue, independent of political powers, in order to face up to a state of deflation and lack of cash in the French economy. Bonaparte, who was striving to consolidate public finances and restore monetary stability in the aftermath of the French Revolution, agreed to provide public funds to the BdF: he regarded the BdF as a tool for fulfilling his objectives. In 1803, he passed a law in order to provide it with an official charter, which notably endowed it with the exclusive right to issue banknotes in Paris for a period of 15 years. Shortly thereafter, the BdF experienced a bank run owing to the issuance of large amounts of banknotes to finance public spending that eroded public confidence in banknotes. In response, in 1806, Napoleon decided to monitor a reform designed to allow him to exert better control over the BdF's activities. This reform, which was complemented in 1808 with an imperial decree providing for the "basic statutes" of the BdF and for the creation of discount offices in main French cities, promoted a relatively balanced power relationship between the State and private shareholders, which was to run until 1936. During that period, the BdF's right to issue banknotes was extended and the network of its discount offices expanded. To deal with the financial crisis that arose from the 1848 Revolution and later from the Franco-Prussian war (1870) and the First World War (1914), the BdF's notes became fiat money for some time. They became fiat money for good in 1936. Legal tender was first experimented with in the 1848–50 and 1870–75 periods, before being definitively enforced in 1875.

The balanced power relationship between the State and private shareholders introduced in 1806 was amended by the *Front Populaire* government in 1936. Finally, the BdF was nationalized in 1945. The purpose was to enable the State to impose a tighter control over the BdF's activities and ensure that general interest would prevail over private interest. The next important events were the revamping of the BdF's statutes in 1973, the enactment of its independence in 1993, and its affiliation to the European System of Central Banks in 1998. The 1973 statutes updated the organization and control of credit and the BdF's administration. The BdF's independence was a requirement of the Maastricht Treaty, and its affiliation to the European System of Central Banks fitted into the process of European monetary integration.

Although it was established in the form of a private bank designed to provide cash to the economy, the BdF was to maintain close links to the State. Actually, it became the State's banker, as it was committed to provide the State with advances on a regular basis. This commitment was considered a normal counterpart to the privilege of issuing notes. It was also a consequence of Bonaparte's original involvement in the BdF's establishment. In the course of time the State needed more and more cash, especially in times of war. However, these facilities in favour of the State came to an end in 1994 in accordance with the provisions of the Maastricht Treaty. It should be noted, too, that the BdF has, on behalf of the State, links with franc-zone member countries.

From 1914 onwards, the BdF was also vested with responsibilities in the management of foreign reserves and the stabilization of the French franc exchange rate. Credit granted by the BdF to the economy decreased until 1970, when it put a stop to that function. At the same time, the BdF was assigned responsibilities for the supervision of commercial banks and for the conduct of monetary policy. In this way, it progressively achieved the status of the commercial banks' central bank.

As a central bank, the BdF primarily got involved with the settlement of payments among commercial banks. It was committed to issue money in order to allow the latter to make payments between them and thus ensure the unity of the domestic currency. Issuance of the BdF's money took place through a number of different operations. For a long time, rediscounting transactions were predominant. However, from the beginning of the 1970s, open-market transactions became the rule, albeit with some ups and downs in the early stages.

The implementation of the European Monetary Union (EMU) brought about significant changes in the role of the BdF. As already mentioned, it was made independent of the State as from 1993. This means that it had henceforth to conduct monetary policy (aimed at price stability) on its own, without seeking or taking instructions from the French government or any external bodies. 1998 was marked by the establishment of the European Central Bank (ECB), the European System of Central Banks composed of EMU member countries' central banks, and the Eurosystem comprising the ECB and the central banks of member countries that had adopted the euro. This means that the BdF, just like its partners, lost its autonomy with respect to monetary policy and the regulation of the domestic banking system. Henceforth, it was the ECB that was in charge of monetary policy in the whole euro area. That is consistent with the implementation of the euro: the management of a single currency commands a single monetary policy.

As regards regulation of domestic banking systems, the ECB is being given enlarged banking supervision responsibilities. It should be noted that, for these reasons, national

central banks of the Eurosystem are usually considered as mere branches of the ECB: the latter would act as the central bank of the whole euro area. However, this statement is inaccurate. So far, in fact, no generalized and centralized gross settlement mechanism analogous to the one managed by the BdF and any other central bank in sovereign countries has been implemented (Rossi, 2012). From this point of view, the euro is not a fully fledged single currency, and the BdF is still an actual central bank, which is not the case with the ECB.

CLAUDE GNOS

See also:

Banking supervision; Bank run; Cash; Central bank independence; Euro-area crisis; European Central Bank; European monetary union; Fiat money; Financial crisis; Open-market operations; Settlement system.

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Barings Bank

The history and evolution of Barings Bank provides a convenient thumbnail sketch of the rise and fall of a modern financial institution. Originally founded on the first day of 1763 by the two Baring brothers, John and Francis, the company began as a London merchant house, the John and Francis Baring Company, engaged in the surging textile trade. Over the next decades, the Baring Company grew from a trading house to an institution that earned profit by arranging finance for other companies' trading, activities that today are known as merchant banking. It was quite a natural evolution for the Barings to move from financing private institutions to financing government activities.

Despite having been commissioned by the British government to help finance their army during the American Revolution, and then against the French, in 1803 Barings also aided the United States in the purchase of Louisiana, thus helping to finance Napoleon in his war against Britain. At this point in time the Bank was demonstrating signs of growing into a modern capitalist institution, one more loyal to its own profitability than its country of origin.

By the early nineteenth century Barings, at this point Baring Bros. & Co., had achieved a level of fame that prompted the famous quote, attributed to the Duc de Richelieu, that "There are six great powers in Europe; England, France, Prussia, Russia, and the Barings Brothers."

Barings had by this point in time become so powerful that they rivalled the Rothschild empire. As a family they were sharp businessmen, but unlike other family concerns they did allow non-family members into the inner sanctum.

For most of the nineteenth century the rise of Barings was steady and evolutionary, serving as a template to define how contemporary banking would proceed. The Baring

family amassed great fortunes, art collections, and stately homes. The core of the business was still financing trade, but the practice of using the Bank's own holdings for investment opportunities was becoming a more important component of their business.

In 1886 the company issued shares in the Guinness Brewery. The issue of both preferred and ordinary shares was in such demand that the shares allocated to the Barings Bank itself, and their contacts in the financial world, caused all concerned to achieve enormous profits.

This financial success encouraged the Bank to enter into more risky ventures. In the past the financing of America's financial infrastructure had gone well, owing to the rise of the US's place in the industrial world. Now they would involve the Bank in doing the same in the more risky South America.

In 1890 Barings made an investment in Argentina. The Buenos Aires Water Supply and Drainage Company was underwritten by the Bank in return for the building concession. Barings sent the funding to South America before issuing the shares needed to raise the funds. Unfortunately the shares proved extremely difficult to sell.

Political upheaval in South America began almost immediately, and the Bank found it impossible to pay its bills. Almost simultaneously Russia withdrew large deposits from Barings Bank, and with tight credit owing to high interest rates the Bank's failure seemed imminent.

At this point in time Barings Bank was one of the greatest banks in the world, and it was thought that its failure could cause a domino effect and shake faith in the international merchant banking system.

A consortium was organized by the Bank of England that saved Barings Bank, though at the expense of the considerable fortunes of family members involved in the Bank. The value of being "too big to fail" saved the Bank, and after its re-capitalization the Baring Bros. & Co. Ltd was created. Never again would family fortunes be imperilled.

The twentieth century saw a new version of Barings Bank. Gone was the risk-taking bank; the new century ushered in a much more conservative institution.

The First World War did considerable damage to Barings' standing in the financial world. The war "in effect closed down the world of international trade and finance on which Baring Brothers had made its name and fortune in the nineteenth century", and by the time the war ended Barings "was no longer needed by the great foreign powers" (Gapper and Denton, 1996, p.88). The Second World War increased the Bank's reluctance to be a risk taker. Now it would raise finance for large projects but seldom risk its own capital. By the mid 1960s the bulk of the Bank's work dealt with mergers and acquisitions.

As profits began to dry up from these conservative banking practices, the company started to look overseas, first to South America, and then to Japan. One of the new activities the Bank investigated was increasing their management of private clients' funds. This new initiative was fuelled in part by the massive rise in cash holdings, after 1973, of oil-providing Middle Eastern countries.

Barings Securities, the investment arm of the Bank, began to move into Asian markets by the mid 1980s. By the late 1980s the investment branch of Barings Bank was driving the profitability of its entire enterprise.

In 1989 Barings Securities hired a young margin clerk named Nick Leeson, who had ambitions to be a trader. By the early 1990s, he was in Singapore, and although the exact

date is controversial, it is certain that by 1992 he was conducting hidden trading through Account #88888. Relying upon a dysfunctional management style, lack of communication between different branches, lax regulation and outright fraud, Leeson brought about the collapse of Barings Bank in 1995.

No longer “too big to fail”, Barings Bank was purchased by ING, a Dutch company, and after more than 200 years of banking Barings Brothers & Co. Ltd ceased to exist. In this regard, Fay (1996, p. 298) asks and answers a relevant question: “Will an event like the collapse of Barings happen again? Of course it will. Somewhere, it – or something like it – is happening now”.

ROBERT H. KOEHN

See also:

Investment banking; Merchant banks; Systemically important financial institutions.

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Basel Agreements

The Basel Agreements are a set of documents issued by the Basel Committee on Banking Supervision (BCBS) defining methods to calculate capital levels banks should be required to maintain given the risks they accept on the assets they record within their balance sheets. The first agreement was signed in 1988, amended in 1995, rewritten in 2004, and is currently in its third version, known as Basel III.

These agreements were a response to two concerns that emerged in the 1970s. On the one hand, there was increasing discomfort among regulators, government authorities and conservative academic economists with what was seen as a growing problem of moral hazard created by the existence of safety nets for the banking sector. It was believed that safety nets created an environment where banks were stimulated to seek riskier assets because eventual losses would be borne by the authorities rather than by banks themselves. The second concern related to the increasing internationalization of banking activity, which made it difficult for national regulators to monitor properly the risks to which banks under their jurisdiction were exposed.

The 1970s witnessed a number of episodes of banking crises that quickly became or threatened to become global problems, like the cases of the Franklin National Bank in the United States and Herstatt Bank in Germany. As a result, the BCBS was created as an informal “club” of national financial supervisors to discuss and coordinate joint initiatives to improve systemic safety. The BCBS is hosted by the Bank for International Settlements (BIS) in Basel, Switzerland, but works independently of the BIS. As an informal group, the BCBS has no formal powers. Its members do not have the mandate to commit their countries to decisions taken by the BCBS, so that partial or total adherence to its directives is strictly voluntary and in the terms that are chosen by each country’s political authorities.

The Basel Agreements are known mostly because of the principle they put forward that, for prudential reasons, banks should maintain capital levels that are proportional

to the value of assets they hold weighted by their risk. During most of the twentieth century, prudential regulation aimed at guaranteeing the liquidity of bank deposits to avoid bank runs like those that led the US banking system to collapse in the early 1930s. By the 1970s, however, it was believed that the most important piece of that regulation, deposit insurance schemes, had created a situation where banks would seek riskier assets to increase their profitability, trusting that clients would be complacent because their deposits were insured by government institutions. Moral hazard created by the existence of deposit insurance schemes, however, were causing the banking sector to become more, instead of less, risky. The idea of demanding banks to maintain capital in proportion to their risk-weighted assets, in theory, should correct the problem, as banks would now be risking their own capital in case their loans were non-performing. As a result, banks would be more cautious (or so was expected) when selecting assets to purchase and hold in their balance sheets.

The first agreement, Basel I, stated that banks should maintain capital to the proportion of 8 per cent of their risk-weighted loans. Risk weights were provided by the BCBS, aggregated in five “buckets”. The agreement was adopted by a surprisingly large number of countries, much beyond what the BCBS itself expected. Two criticisms, however, were almost immediately raised. First, Basel I dealt with credit risks only, neglecting all other risks, particularly market risks – that is, risks created by the variation of marketable securities prices – when banks were increasingly diversifying their activities worldwide. Second, grouping risks into five “buckets” seemed to gloss over fundamental risk differences between assets within the same category. As a result, Basel I was amended in 1995 in order (i) to include market risks and (ii) to allow that qualified banks could calculate their risks themselves. The extension of this freedom to calculate risks to credit risks (as well as considering another class of risk, operational risk), besides other adjustments, led to a new version of the agreement, Basel II, signed in 2004.

Basel II turned out to be an exceedingly complex strategy and its implementation faced many difficulties, including the refusal of the United States to comply with some of its key recommendations (recall that adherence to the Basel Agreements is voluntary). The global financial crisis that burst in 2008, in addition, showed that banks’ own risk calculations were irremediably flawed. A large majority of those banks that were either shut down or had to be bailed out exhibited appropriate levels of regulatory capital before the meltdown. The use of risk weights calculated by banks themselves, besides the possibilities it opens of fraud and manipulation, cannot capture systemic risks, which have the nature of externalities. Risk measurements that individual banks take as parameters are in fact endogenous to the banking sector and to the economy. Moreover, as pointed out by post-Keynesians, risk calculations are only useful if one assumes that the future will replicate the past. Under fundamental uncertainty, as Keynes argued, one can be sure only that this assumption is wrong. Both financial institutions and regulators were reminded of this basic truth yet again when all risk calculations prescribed by Basel II turned out to be wrong.

The realization that Basel II was a failure led the G20 group of countries to command the BCBS to rethink Basel rules. Hence, the BCBS came up with Basel III, a new set of measures where, on the one hand, Basel-II-required capital levels were increased, and, on the other hand, new demands were made, of which two are the most important: banks should now calculate a direct leverage ratio – that is, the ratio between total assets and

net worth – to be limited at 33; and banks should also respect liquidity requirements, defined in two ways: a certain share of assets held should consist of very liquid assets to avoid forced asset sales like those that happened in 2007 and 2008 in the United States; and access to financing lines should be guaranteed. While it is doubtful whether more of the same – that is to say, strengthening Basel II's demands – can work, the new regulatory framework promises to reach more solid systemic safety.

As one would expect, banks reacted to Basel III by stating that it would reduce the supply of credit and choke incipient recoveries in countries hit by the global financial crisis. Many national governments endorsed this concern, so that some measures were watered down to some extent or had their implementation postponed. As adherence to the Basel Agreements is voluntary, even countries that decided to implement Basel III may choose which measures should be introduced and when. As a hybrid instrument, containing the market-friendly inept measures proposed in Basel II and introducing time-tested demands in terms of direct leverage and liquidity, Basel III seems at this point to contribute not much more than marginally to the improvement of global financial systemic safety.

FERNANDO J. CARDIM DE CARVALHO

See also:

Bank capital and the new credit multiplier; Bank deposits; BIS macro-prudential approach; Capital requirements; Financial crisis; Systemically important financial institutions.

Bernanke, Ben Shalom

According to Harris (2008, p. 203), Ben Shalom Bernanke (1953–) “seems to have systematically trained himself to become a top central banker”. That training and experience has been quite different than his predecessor as Chairman of the Board of Governors of the US Federal Reserve and of the Federal Open Market Committee (FOMC), Alan Greenspan. The majority of Bernanke's career has been as an academic within prestigious US institutions. Following a degree in economics at Harvard (1975) and a PhD at the Massachusetts Institute of Technology (1979), Bernanke initially worked as an Associate Professor at Stanford (1979–83), before holding a variety of Assistant and then Full professorial positions at Princeton (1983–2002), where he remained a member of the faculty until 2005. He served as editor of the *American Economic Review* between 2001 and 2004.

Bernanke's principal academic work has focused on the role of monetary policy. He has published widely on the causes and consequences of the Great Depression (see Bernanke, 2000). Whilst not unequivocally supportive of all aspects of Friedman and Schwartz's (1963) work, he conforms to the position that the Fed adhered to the gold standard in a way that reduced liquidity and that it allowed an escalating set of bank failures (was “liquidationist”). Following Friedman and Schwartz (1963), Bernanke argues that a central bank can cause and accentuate aspects of the business cycle and that it has a key role in shaping that cycle. Concomitantly, Bernanke's interests extend to the Japanese response to deflationary pressures in the 1990s, and more generally the role and scope of central banks, particularly inflation targeting (see Bernanke et al., 1999).

Bernanke's academic work provided a basis for his transition to public service. He acquired an inside view regarding the US Federal Reserve system as a visiting scholar and then also served as a member of the Academic Advisory Panel of the New York Fed (1990–2002), before becoming a member of the Board of Governors of the Fed in 2002. He briefly served as Chairman of the President's Council of Economic Advisors (2005–06), before being appointed Chairman of the Board of Governors of the Fed in February 2006, to which he was reappointed in 2010.

Bernanke has gradually sought to change the practices and orientation of the Fed. He shares with Greenspan a broad commitment to the new-Keynesian synthesis, where the central bank can use its main policy tool, the federal funds rate of interest, to stabilize a trend growth rate of real Gross Domestic Product (GDP), subject to an output gap and the Non-Accelerating Inflation Rate of Unemployment (NAIRU). The central bank's key focus is price stability, and, based on central bank independence, resistance to "populist-political" pressures likely to stoke inflation through lagged expectations effects. However, Bernanke has been aware that he lacks Greenspan's ability to dominate the FOMC, and has sought to promulgate a more democratic interchange for interest rate setting. As an academic he previously advocated formal inflation targeting and has shifted the Fed in this direction (transcripts released in 2001 reveal that the Fed has had an unofficial CPI target of 2 per cent since 1996). Bernanke has moved towards a more "constrained" form of "discretion", in conjunction with a greater degree of transparency and more frequently published forecasts and data.

Bernanke's mode of communication at the Fed has been less ambiguous than Greenspan's form of "Fedspeak". The intent, in both cases, however, is to constructively shape expectations. In Bernanke's version, a basic tension has arisen in terms of the democratic nature of FOMC meetings. One cannot unequivocally create expectation-shaping FOMC trends if the potential for dissent is increased and contradictory interest rate changes become possible. Further, Bernanke's tenure as Chairman of the Fed has coincided with the financial crisis and its aftermath. In such circumstances, a New Keynesian economist will acknowledge that models become less reliable and that prior strategies – essentially gradual chains of small incremental federal funds rate changes – cease to be effective. This means that inflation targeting based on data transparency and a more rule-constrained approach within a New Keynesian understanding has become less relevant for Bernanke.

Bernanke has proven flexible in his approach to monetary policy: embracing rapid larger reductions in the federal funds rate of interest towards a zero-bound situation, employing varieties of quantitative easing, putting aside initial moral-hazard issues in order to supply significant volumes of liquidity to the finance system whilst also playing a supportive role to Treasury initiatives, and maintaining a set of contingency plans to deal with any incipient deflation. In 2009, he was named *Time* magazine's "Person of the Year".

The broader critical framework in which Bernanke should be considered is his adherence to the New Keynesian synthesis. The reliability of the models and strategies provided by that synthesis raise further issues about what central bank policy should be, as they did not just break down but contributed to the crisis (Morgan, 2009). Bernanke is also an advocate of the financial accelerator model (which is typically not modelled in the formal sense), where the interaction between wealth effects and credit creation

augments GDP growth driven by the financial sector and often in ways that are insensitive to chains of small incremental changes in the federal funds rate of interest. This position provides for a greater scepticism regarding the capacity of financial markets to forestall and resolve bubbles, and calls for the central bank to do more in this regard. Yet, in contradiction, Bernanke provided Greenspan's Fed with intellectual authority for its complacent attitude to the growing problems of the financial system. As both an academic and a member of the Fed Board of Governors, he generally supported the position that it was extremely difficult to identify asset bubbles and equally difficult to deflate them (rather than deal with the aftermath). Further, in 2005 he made the case that the root problem of global imbalances was excess saving in China and elsewhere, with regard to which the United States was playing a generally positive role in absorbing the excesses.

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See also:

Bubble; Central bank independence; Federal Open Market Committee; Federal Reserve System; Greenspan, Alan; Inflation targeting; *Monetary History of the United States, 1867–1960*; Output gap; Quantitative easing; Rules versus discretion.

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Biddle, Nicholas

Nicholas Biddle (1786–1844) was the third and most famous president of the Second Bank of the United States (SBUS). He was an active president of the Bank, perhaps anticipating certain central-banking functions (Hammond, 1991). Biddle famously opposed the US President Andrew Jackson during his "war" against the SBUS.

The SBUS was created in 1816, the First Bank of the United States having lost its charter in 1811. The fiscal requirements of the US federal government during the War of 1812, the bank runs of 1814, and wartime inflation conspired to change the mind of US Congress (Walters, 1945). The SBUS was to be private, though 20 per cent of its capital was supplied by the US federal government in the form of bonds. In addition, the SBUS would maintain a special relationship with the US federal government, as the US President would appoint five members of its 25-person board, while the bank would act as the government's fiscal agent. The SBUS was subscribed with roughly 35 million US dollars, and was, by Biddle's tenure, the largest corporation in the nation (Hammond, 1991).

Biddle was born to a wealthy and notable family, and was broadly educated at a very young age. Prior to his work at the SBUS, Biddle was elected to the Pennsylvania state

legislature, where he advocated for the granting of a state charter to the SBUS. He was subsequently appointed by US President Monroe as a director of the Bank, and although he had little experience, he is said to have been well read in political economy (Catterall, 1902). Aged 37, Biddle became the president of the SBUS.

A key question is whether Biddle and the SBUS can be said to have performed central-bank functions. Because state banknotes were accumulated by the SBUS, the Bank had the opportunity to redeem (or fail to redeem) state banknotes for specie. This could potentially place (or relieve) pressure on the ability of state banks to create new credit (Hammond, 1991). Interestingly, this is essentially the opposite situation to today's central banks that have a (net) debt to private banks and attempt to affect credit conditions through the manipulation of reserves. In addition, the SBUS made direct loans to the private sector, as it also functioned as a commercial bank. There was, however, a conflict, given the need to maintain the SBUS reserve position in a crisis and its potential desire to act as lender of last resort. The SBUS would be under pressure to contract loans and note issue precisely when its services as lender of last resort would be most needed. Overall, it seems that Biddle used the SBUS to modify reserves in a countercyclical manner.

Additionally, Knodell (1998) describes how Biddle created both an interbranch clearing system and had the SBUS become a market maker in domestic bills of exchange, thus moving the nation towards a stable and uniform domestic currency system. The Bank's notes were accepted as a substitute reserve asset, and could be used in the foreign exchange market, and the Bank's own reserve policy could be changed.

The Jacksonian era ushered in a significant shift in the role played by federal and state government in the market. By the election of 1832, the SBUS had become a central issue in the Jacksonian platform (Remini, 1967). As Hammond (1991) notes, the coalition that mobilized against the SBUS was a combination of hard-money Democrats, state banks, and financiers in New York whose opposition to the Bank masked their conflicting interests.

Biddle applied for a re-chartering of the SBUS four years before its charter was set to expire in 1832 (Hammond, 1991). US President Jackson vetoed the charter, and his veto message would become a famous document. By the end of 1833, Jackson had selected "pet" banks to place government deposits in, after removing them from the SBUS.

Biddle's management of the politics of the SBUS war has alternatively been characterized as naïve (Hammond, 1991) or arrogant and potentially corrupt (Remini, 1967). After the removal of federal deposits, Biddle contracted the volume of outstanding loans, possibly to punish Jackson. The SBUS and Biddle then limped along for the remaining years of the charter.

The consequence of the removal of the charter is still a matter of debate. A speculative boom emerged and came crashing down in 1837. Prior to Temin's (1969) seminal work, a general consensus had emerged that the fall of the SBUS was to blame. Without federal deposits, the SBUS and Biddle lost a great deal of regulatory ability. Temin (1969) drew attention away from the SBUS war, and placed responsibility with a substantial specie inflow into the country. More recently, Knodell (2006) has argued that the removal of the SBUS did in fact contribute to the boom in speculative lending. In addition, it has been claimed that the "specie circular", a Jacksonian policy that required land sales to be made in specie (and which Biddle opposed), was partially to blame (Rousseau, 2002).

Biddle resigned from the SBUS in 1839, and by 1841 the institution was liquidated. He was blamed by the SBUS stockholders, who claimed that he had mismanaged funds. When Biddle died in 1844, he was battling a lawsuit from these stockholders (Hammond, 1947). Biddle then is remembered as an overreaching regulator by those sympathetic to the hard-money interests, while he is remembered by those sympathetic to the sound-money school as an early central banker who was eventually overcome by politics.

NATHANIEL CLINE

See also:

Bubble; Clearing system; Financial crisis; First and Second Banks of the United States; Lender of last resort; Reserve requirements.

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BIS macro-prudential approach

With the global financial crisis that burst in 2008, the Bank for International Settlements (BIS) is receiving more and more attention for its analysis of financial stability issues. Typical for the BIS is a broad approach to financial stability, "marrying" its micro- and macro-prudential dimensions.

The BIS was set up in 1930 as a forum for central bank cooperation. It provided central bankers with three main services (Toniolo, 2005): research on issues relevant to international payments and prudential supervision, a venue for regular and discreet meetings, and a financial arm (particularly important in the gold market).

The BIS macro-prudential approach to financial stability had its origin in the late 1970s, when central bankers worried about the strong growth of external debt in developing countries. In this context, the BIS, and especially Alexandre Lamfalussy, its economic advisor, emphasized that a borrowers' market had been developing, mainly because of loose US monetary policies. So, a distinguishing characteristic of the BIS approach is to place debt problems in a broader macroeconomic framework, paying particular attention to the interaction of global imbalances and debt dynamics. The BIS macro-prudential approach referred further to prudential policies that promote the safety and soundness of the broad financial system – and not of individual financial institutions alone.

The macro-prudential concept was first publicly presented in the Cross Report on innovations in international banking (BIS, 1986). In that way, the macro-prudential approach became very closely associated with financial innovations. However, even before the Cross Report, Lamfalussy (1985, p.411) had emphasized the accelerating speed of financial innovation and raised the issue of systemic stability: “You may argue that when risk-averse market participants shift risks [. . .] onto willing risk takers, everybody is going to be better off. This may well be the case, but increased collective happiness does not necessarily mean greater systemic stability. Or does it?”. Later, Lamfalussy (1986), then the BIS General Manager, gave a negative answer to this question. His argument was strongly influenced by his analysis of the Latin American debt crisis (Maes, 2010). In his view, the shift to a generalized use of floating interest rates in medium-term bank loans, during the petrodollar recycling in the 1970s, allowed banks to protect themselves against the erosion of their intermediation margins. However, it also had the effect of passing on short-term market interest rate movements to borrowers. With negative real interest rates, credit demand was stimulated, leading to a period of over-expansion. The return to positive real interest rates in 1979 placed a crippling burden on many debtors. The ensuing debt crisis threatened the world financial system. It was in Lamfalussy’s view a clear argument for a macro-prudential approach, complementing the micro-prudential supervision of financial institutions.

Later, in the early 2000s, the BIS macro-prudential approach gained prominence. Crockett (2000, p.2) defined it as “limiting the costs to the economy from financial distress, including those that arise from any moral hazard induced by the policies pursued”. As such, it is very much concerned with systemic risk. It contrasts with the micro-prudential objective, which focuses on limiting the failure of individual institutions (idiosyncratic risk). The macro-prudential approach focuses on the financial system as a whole, paying special attention to the risk of correlated failures and to institutions that have a systemic significance for the economy. It also emphasizes that systemic risk arises primarily through common exposures to macroeconomic risk factors. Further, White (2006) noted some interesting similarities with Austrian business cycle theories: a focus on imbalances in the economy, the assumption of systemic errors of judgment by economic agents, and an inherent tendency towards periodic crises. There are, further, also similarities with the work of Hyman Minsky, who was well appreciated at the BIS (see Borio et al., 2001). An additional characteristic of the macro-prudential approach is the view that aggregate risk depends on the collective behaviour of individual institutions, the so-called endogeneity of risk. A crucial implication is that actions that might be appropriate for individual financial institutions may not result in desirable aggregate outcomes (for instance, sales of assets in bad times).

The macro-prudential approach also has clear policy implications. These have been taken up in the Basel III regulatory framework (Borio, 2012), both the time dimension (how to address pro-cyclicality) and the cross-sectional dimension (the calibration of regulatory and supervisory arrangements depending on the systemic importance of the institutions concerned).

Another implication of the macro-prudential approach is that central banks should not only focus on price stability but also take financial stability as an objective. This is an object of serious debate. For instance, Issing (2012, p. 14) argues that the “line in the sand” should be drawn where maintaining price stability is endangered.

Compared with the late 1970s, the macro-prudential concept has gained in depth and dimension (Clement, 2010). It now commonly refers to a prudential framework that focuses on the financial system as a whole, and which through the application of specific tools seeks to limit risks deriving from the pro-cyclicality of the financial system (namely, how risk evolves over time, during the financial cycle) as well as from the distribution of risks within the financial system at any point in time (the so-called cross-sectional dimension of risk; for instance, the “too big to fail” problem). Ultimately, however, the goal of a macro-prudential approach remains what it has been since the term was first used in the late 1970s and that is to limit the risks and costs of systemic financial crises.

IVO MAES

See also:

Basel Agreements; Financial crisis; Financial innovation; Financial instability; Lamfalussy, Alexandre; Macro-prudential policies; Macro-prudential tools; Minsky, Hyman Philip; Negative rate of interest; Systemically important financial institutions.

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Bretton Woods regime

Bretton Woods is a location, period of history, beginning of an era in the twentieth century, birth of an international organization, but, most of all, an international monetary system to regulate trade, peg currencies to one standard, and maintain a regime of fixed exchange-rate parity.

In July 1944 at Bretton Woods, New Hampshire, 44 nations under official British and American leadership set up economic measures for post-war reconstruction. The US dollar – pegged to gold – was approved as the new monetary standard. Two new insti-

tutions were also established with specific tasks: the Stabilization Fund (International Monetary Fund, IMF), a “special organization” (Horsefield, 1969, p.39), to be a watchdog facilitating and promoting trade through monetary stabilization, and the International Bank for Reconstruction and Development (World Bank), with the role of providing member nations with “necessary capital not otherwise available except possibly on too costly terms” (ibid.).

While the role and the purpose of the World Bank, targeting long-run structural changes, were straightforward, those of the IMF, involving the participation of member nations in short- and medium-run monetary coordination, were more challenging. The IMF would expect member nations to adhere and adjust their trade policies to given common goals, implicating and impacting national policies. The IMF would provide “consultation and collaboration on international monetary problems” (Horsefield, 1969, p.2). Implied was that achievement of high levels of employment and income was in concordance with the IMF’s policy of dissuading “foreign exchange restrictions” and promoting “expansion and balanced growth of international trade” (ibid.). To avoid slowdown in the world economy, the IMF’s general resources would be made available “to correct maladjustments in their balance of payments” (ibid.). Finally, to “avoid competitive exchange depreciation” (ibid.), the IMF would promote exchange-rate stability.

The final consensus on the currency standard and the responsibilities of the agencies was known as the Bretton Woods gold-standard agreement. These international monetary arrangements after World War II, which served to guide the world economy for 28 years, came to an end in 1972. Under Nixon’s administration, the United States, finding itself unable to fulfil its obligation to guarantee the US dollar’s convertibility, decided to end the agreements, under circumstances similar to those of the early 1930s, when the British pound gave way to pressure. The IMF and World Bank have nonetheless continued to function, leaving the supply of the international currency to the whims of the US Federal Reserve.

Unlike the establishment of the US dollar as the international standard or the *ex-nihilo* creation of the euro, the British pound, without agreements or treaties, became the international currency of the nineteenth century. During that first gold-standard era, the pound was accepted as an international currency through trust, reliability, and market needs and risks. As, however, industrial production in the advanced economies grew substantially and in scale, needs for finance and credit became more intricate. The use and abuse of the instruments of money produced more violent financial fluctuations with devastating consequences, like the 1929 crisis. Proposals for the Bretton Woods agreements were conceived, as depression was looming again and war raging. It was during those difficult circumstances that plans for an international monetary agreement were proposed.

The British Keynes and the American White Plans were the main proposals discussed at Bretton Woods. While both called for the setting-up of monetary institutions to aid and promote international trade, the two were fundamentally different. The Keynes Plan presented an ambitious concept with relatively little political interference and structural cumbersomeness: “a central institution, of a purely technical and non-political character” (Horsefield, 1969, p.21), entailing minimal interference “with internal national policies” (ibid., p.19) and limited authority for “the Governing Board of the proposed Institution” (ibid.). It called for safeguards for “the rights and privileges of the smaller

countries” (ibid., p.20) and insisted that management be “genuinely international without preponderant power of veto or enforcement to any country or group” (ibid.). Keynes had in mind the contemporary bleak consequences and disarray resulting from “extravagant fluctuations of market conditions” (ibid., p.19), leading nations to resort to “unilateral action and competitive exchange depreciations” (ibid., p.20) and thus proposed a monetary arrangement to aid in offsetting or preventing “deflationary and inflationary tendencies in effective world demand” (ibid.).

Keynes’s proposal also consisted in the establishment of an International Clearing Union, a bank through whose accounts nations could settle their balance-of-payment differences. To avoid speculations related to bilateral currency exchanges, Keynes suggested the creation of an “international bank-money” (Horsefield, 1969, p.21), the *bancor*. “[F]ixed in terms of gold and accepted as the equivalent of gold” (ibid.), it would serve exclusively to balance the assets and liabilities of member nations. The *bancor*, strictly for use by central banks, would be capable of self-equilibrating international financial flows, since the deficits of certain countries would simply be the counterpart of the surpluses of others. With an agreed-upon stock of reserves of *bancor*, “[i]f no credits can be removed outside the clearing system, but only transferred within it, the Union can never be in any difficulty as regards the honouring of cheques drawn upon it” (ibid., p.22). Keynes argued the need for “an agreed plan for starting off every country after the war with a stock of reserves” (ibid., p.21), stating that “it is not for the Clearing Union to assume the burden of long term lending” (ibid., p.20). Keynes felt that “operating through whatever national organ, such as a Treasury or a central bank, is most appropriate, private individuals, businesses and banks other than central banks, [will] each [be] continuing to use their own national currency as heretofore” (ibid.).

The White Plan was the one largely adopted in the final agreement of Bretton Woods. It favoured the dominance of the US dollar over other currencies, tilting the balance of power toward creditor (over debtor) countries. It resulted in a system institutionally intrusive, bureaucratically burdensome, and disproportionate in the weight it gave to the United States in deciding the fate of the organizations. Had the Keynes Plan been adopted, the financial environment of today would undoubtedly be very different.

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See also:

Bancor; Dollar hegemony; Federal Reserve System; International Monetary Fund; International settlement institution; Keynes Plan; White, Harry Dexter.

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Bubble

A bubble is when the price of financial assets increases in an irrational way after a long period of optimistic expectations and high profits. When a bubble inflates, “speculators invest only because the asset price is rising” (Rapp, 2009, p.vi). Asset prices grow irrationally and speculators increase their purchases until the bubble bursts; this is

when stock prices start decreasing (Fisher, 1933). Referring to the dangers induced by bubbles, Keynes (1936, p. 159) maintained that “speculators may do no harm as bubbles on a steady stream of enterprise. But the position is serious when enterprise becomes the bubble on a whirlpool of speculation”. According to Galbraith (1990 [1994], p. 13), the factors contributing to the euphoria inflating a bubble are manifold: “The first is the extreme brevity of the financial memory. In consequence, financial disaster is quickly forgotten. [. . .] The second factor contributing to speculative euphoria and programmed collapse is the specious association of money and intelligence”. In this regard, Kindleberger (1996, p. 13) noted that “[t]he word *mania* emphasizes the irrationality; *bubble* foreshadows the bursting. [. . .] [A] bubble is an upward price movement over an extended range that then implodes. An extended negative bubble is a crash”.

Bubbles are inherent to a capitalist system. They are the result of a structural change in financial circuits, where various elements come into play, including short-term profit expectations, interest rate and decreased profits in production activities. The transformation of the financial system after the demise of the Bretton Woods regime induced small bubbles that in a number of cases led to a crisis, which is a recurrent characteristic of the period from the 1970s up to the global financial crisis that erupted in 2008. Financial deregulation and liberalization processes, along with financial innovation and financial intermediaries, propitiated a shadow financial system that grew stronger until it exploded in 2008, after the collapse of Lehman Brothers, a US-based investment bank. A recent example of a financial bubble is the tremendous price increase of financial assets before the global financial crisis that burst in 2008.

The first point to an understanding of asset bubbles is financial fragility and instability in the business cycle. “Instability emerges as a period of relative tranquil growth transformed into a speculative boom” (Minsky, 1986, p. 173). Financial fragility, inherent to the capitalist system itself, propitiates bubbles via Ponzi financing in order to earn ephemeral profits. When the bubble bursts, a credit crunch occurs and, with that, a long recessionary period, deflation, and massive losses of employment. Creative destruction invites new investors again, so that a further business cycle begins anew (see Schumpeter, 1934).

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See also:

Asset price inflation; Bretton Woods regime; Bubble Act; Financial bubble; Financial crisis; Financial innovation; Financial instability; Housing bubble; Investment banking; Shadow banking.

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Bubble Act

The so-called “Bubble Act” was a durable, if inconsistently enforced, feature of British law from its passage on 9 June 1720 to its repeal on 29 June 1825. To modern eyes, the central clauses of the Act are those that prohibited the establishment of joint-stock corporations issuing transferable stock unless a charter had been secured from the Crown. The Act has often been interpreted as the British Parliament’s attempt to broadly constrain speculative manias of the type that developed around the South Sea Bubble of 1720. Beyond the formal penalties prescribed for use against unincorporated firms, it has commonly been argued that the Act exercised a “symbolic force” that delayed the evolution of corporate organization in Britain (McQueen, 2009, p. 20).

More recent scholarship has greatly clarified the origin, intent, and lasting effects of the Act. Formally titled “An Act for better securing certain Powers and Privileges, intended to be granted by His Majesty by Two Charters, for Assurance of Ships and Merchandize at Sea, and for lending Money upon Bottomry; and for restraining several extravagant and unwarrantable Practices therein mentioned”, the pejorative title “Bubble Act” found common usage only in the nineteenth century. The Act granted charter to two maritime insurance companies, and dealt with speculative activity in but a few of its clauses. Upon closer inspection, the Bubble Act was not originally intended to limit all speculation in joint-stock shares. Rather, the crucial clauses of the Act were passed at the behest of the directors of the South Sea Company (SSC). Modeled on the Bank of England, the SSC was chartered in 1711 largely with the object of refinancing a portion of the Crown’s existing floating debt. Its role expanded greatly over the course of the 1710s, and in February of 1720 the SSC was granted the right to convert the entirety of the State’s 30 million pounds of outstanding debt into SSC shares, a concession for which the Company paid 7.5 million pounds. For the SSC, the profitability of the scheme depended upon a sustained rise in its share price to both reduce the costs to the Company and to attract holders of the Crown’s irredeemable debt (Carswell, 1960).

The first half of 1720 witnessed a marked appreciation in the share prices not only of the SSC, but also of a broad spectrum of joint-stock ventures, some with tenuous or wholly illusory ties to any commercial ambition. As the SSC’s share price temporarily plateaued, this broader market in joint-stock shares threatened to divert interest from the SSC. Drawing upon their long-standing alliance with Tory members of Parliament, a great number of whom held SSC shares themselves, the directors of the SSC pushed for the passage of the Bubble Act to limit competition and defend their share price (Harris, 1994). Crucially, the Act was not passed in the wake of the South Sea Bubble’s collapse, but instead during the last days of the Bubble’s expansion. Fleetinglly successful, the prices of SSC shares continued to rise for the two months following the Act’s passage, before collapsing dramatically by mid-September of the same year.

Though the Act nominally restricted the formation of new joint-stock companies to those granted Parliamentary charter, prosecutions on the basis of the Act were nearly unheard-of in the eighteenth century. Only in the final 15 years of the Act’s existence as law did prosecutions accelerate. While a number of firms were prosecuted for abusing and moving beyond their chartered purpose, these legal challenges were not dependent upon the text of the Bubble Act. Broadly and imprecisely worded, the Act arguably added little, beyond additional punishments, to the existing body of law circumscribing British corpo-

rations (Harris, 2000). If the Act exercised significant symbolic force, this rested upon the hesitancy of Parliament to grant new charters. Plainly fraudulent firms were, no doubt, deterred from petitioning the Parliament for incorporation, but new joint-stock ventures continued to be established throughout the period. Those new charters that were granted were predominantly for the construction of turnpikes, canals, and other transportation infrastructure, ventures that required significant long-term financing. Few chartered joint-stock companies emerged within the nascent manufacturing sector, where capital needs were comparatively modest and short-term. Indeed, there is little clear evidence that the Bubble Act slowed the growth of the British economy in the eighteenth century.

The eventual repeal of the Bubble Act in 1825 was linked to another burst of speculative activity in London markets. From 1821 onward, interest in the stock of domestic infrastructure firms and of mining ventures in Latin America multiplied. With this increasingly frenzied activity in markets came an unprecedented flood of petitions to Parliament for joint-stock incorporation. With this development came a push from some members of the judiciary, Lord Eldon among them, for more stringent enforcement of the now-dated Bubble Act (Harris, 1997). The Parliamentary opposition to the Bubble Act that soon emerged was a reaction to this threat. Members of Parliament that stood against the Act, some of whom served as directors of a number of newly formed joint-stock firms, argued that the Act was, in its current form, unintelligible. Further, it was argued that the legal uncertainty surrounding the status of unchartered corporations hindered the growth of many legitimate ventures. Following limited debate, the crucial clauses of the Bubble Act with respect to Parliamentary assent for joint-stock incorporation were repealed, with royal assent granted on 5 July 1825.

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See also:

Bubble; Financial crisis; Financial instability.

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Bullionist debates

The bullionist controversy took place during the Napoleonic Wars, in particular after the policy measures of 1797 according to which Great Britain abandoned the gold standard and thereby the convertibility of banknotes to gold. The commitments of Great Britain to its allies and the remittances of gold bullion to foreign countries dangerously depleted (from 10 million to 1.5 million British pounds) the Bank of England's (BoE) gold reserves. The rising military expenditures of the British government coupled with rumours of an imminent French invasion triggered a run on the banking system and led the BoE to the suspension of the gold standard and payments in metal. The prohibitions

of payments in gold increased the price of the specie from its mint parity of £3/17s/10½d per ounce to £5/10s in 1813. The British pound depreciated with respect to foreign currencies and the domestic price level increased. Hence, the purchasing power losses of the pound (domestically and internationally) became the focal point of the debate (Viner, 1937 [1965]).

On the one side the bullionists, whose main representative was Ricardo, argued that the loss in purchasing power of the pound was the result of the abandonment of the gold standard in 1797, which allowed the BoE to overissue banknotes. The excess of banknotes led to purchasing power losses of the pound in both domestic and foreign-exchange markets. In short, the overissue of money resembled, to a great extent, the process of debasement attributed to the suspension of the gold standard in the post-1797 years. Another strand of bullionists, with Thornton as its main protagonist, argued that the causes of the increase in the supply of money relative to its demand were real (war financing and a series of bad harvests), which led to inflation and the devaluation of the pound (Viner, 1937 [1965]). However, both strands of bullionists argued that the ultimate cause of inflation, the devaluation of the currency and the increase in the price of gold, was the expansionary monetary policy of the central bank. The policy remedy of the bullionists, and Ricardo in particular, was the decrease in the quantity of (paper) money in an effort to reverse the process and ultimately return to the gold standard.

On the opposite side, the antibullionists were critical of the quantity theory of money. They argued that the rise in prices was due to two years of poor harvests, the increased military expenditures for the Napoleonic wars, and the disruption of foreign trade due to these wars. Further, the increase in the money supply was the result of a higher demand for money. Hence, the antibullionists invoked the “real bills doctrine”, according to which banks were discounting the real (short-term) bills, which represented future production (Green, 1992, pp. 114–16). Thus the increase in money supply was more or less matched with an approximately equal increase in money demand, and so there was no excess supply of money. The bullionists’ counterargument was that, so long as the anticipated rate of profit was higher than the bank’s interest rate, there would be an unlimited demand for money and its supply would follow suit, thus giving rise to an inflationary spiral process, whose occurrence could have been prevented had the gold standard been in place.

The antibullionists further argued that the price of gold was high because of its scarcity, and the immediate restoration of the gold standard would not be sustainable at the official mint price, thus leading to an outflow of gold. The antibullionists questioned the bullionists’ argument that there had been an excessive issue of banknotes that resulted in rising prices, devaluation of the pound and an outflow of gold. Hence, the restriction on the issuance of banknotes not only would not prevent the crisis, but rather would make it worse.

The antibullionists’ arguments were aimed essentially against the quantity theory of money and in favour of the view that economic crises were arising from real and not necessarily monetary causes. Thus, the resumption of international trade and the end of war with France were *sine qua non* conditions for the stabilization of the exchange rate of the pound and also the return to the gold standard, which the bullionists wanted so much. While the arguments of antibullionists were sensible (after all, why should the BoE abandon the gold standard, if there was no pressing need to do so), they were not advanced in any theoretically consistent and therefore convincing way, and so the debate was overwhelmingly won by the bullionists.

In 1819, the BoE started the process of withdrawing (what was believed to be) excess banknotes and gradually restored the convertibility of paper money to gold. The return to gold convertibility often gives the idyllic impression that people anytime and without difficulties could present their paper money to banks and receive the corresponding quantity of precious metal. This is not exactly true: whenever there was fear of gold runs and financial panics in general, which were not infrequent in the UK's turbulent financial history, gold convertibility was suspended or carried out with difficulty.

The issue of the gold standard reappeared in Great Britain once again in 1844, and always remained a controversial subject waiting for a definite solution. As a matter of fact, the debate from the 1850s onwards was between the Currency School (supporting the quantity theory of money and the exogenous character of the money supply, with a position similar to the bullionists) and the Banking School (arguing for the endogenous character of the money supply and sharing views akin to the antibullionist position).

In this connection it is interesting to note Marx's view, whose labour theory of value as well as his commodity theory of money put him in the antibullionist (Banking School) camp. More specifically, for Marx the quantity of money in circulation is determined endogenously, as it reflects the ratio of the value of commodities to the value of gold, both measured in terms of abstract socially necessary labour time. This ratio, which reflects the state of technology and for analytical purposes can be safely assumed to be stable, is in turn multiplied by the mint price of gold. If, for example, it takes 10 labour hours to produce a commodity and 30 labour hours to produce an ounce of gold, then the unit price of this commodity will be 1/3 of an ounce of gold. If we suppose that the price of an ounce of gold is 1,500 dollars, then the monetary expression of value (direct price) of the commodity will be 500 dollars. By multiplying the prices of all commodities by their respective quantities and dividing the product by the velocity of circulation of commodities, we arrive at the necessary amount of money to circulate the total amount of commodities (Green, 1992, pp. 91–4). If there is more money than is necessary for the circulation of commodities, then this excess money might be hoarded (Shaikh, 1980). In the case of banknotes, excess money is converted into gold, and if convertibility is not allowed, then the excess banknotes are converted into a foreign currency, which is converted into gold. If there is no convertibility at all, the excess banknotes are exchanged in the market for gold and thus banknotes depreciate with respect to gold. By assuming the possibility of hoarding, Marx could thus also reject Say's law, which was shared by Ricardo and the other classical economists.

LEFTERIS TSOUFIDIS

See also:

Bank Act of 1844; Banking and Currency Schools; Bank of England; Endogenous money; Inflation; Marx, Karl; Money supply; Quantity theory of money; Real-bills doctrine; Ricardo, David; Thornton, Henry.

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Burns, Arthur Frank

Born in 1904 in what is now Ukraine, the son of poor immigrants, speaking no English as a child, Arthur Frank Burns graduated from Columbia University with both Bachelor and Master degrees in 1925. He taught at Rutgers University from 1927 to 1944, earned his PhD (Columbia University) in 1933, and became an internationally respected scholar, a director of the US National Bureau of Economic Research (NBER), Chairman of the Council of Economic Advisers (CEA) of the US President, Chairman of the Board of Governors of the US Federal Reserve (Fed), and US Ambassador to West Germany. He died in 1987 from complications following heart surgery.

Through his own *Production Trends in the United States since 1870* (Burns, 1934) and then in his collaboration with Wesley Mitchell on measuring business cycles (Burns and Mitchell, 1946) Burns achieved renown as an expert on economic fluctuations as well as providing the initial motivation for the debate over “measurement without theory” initiated by Koopmans (1947). In response Burns could say, as in effect he did in Burns (1946), that Keynesian theory lacked an adequate empirical basis. He later succeeded Mitchell as Director of Research at the NBER and continued in that role until appointed Chairman of the CEA in 1953. He returned as NBER President in 1957, serving until his resignation in 1965 as reported by Rutherford (2008), after a critical report into the Bureau’s research strategy and leadership.

He was appointed Chairman of the CEA by Eisenhower, succeeding the expansionist Keyserling, and served in the period 1953–56. At that time, the continued existence of the CEA was in question but it regained Congressional support during Burns’s tenure, while Burns gained wider public recognition as a trustworthy expert. After the event, his general support for the controversially counter-inflationary stance of Eisenhower in these years was apparent in *Prosperity Without Inflation* (Burns, 1957).

In “Progress towards economic stability” (Burns, 1960) – his Presidential address to the American Economic Association – he noted changes in the structure of industry, the nature of employment and household behaviour amongst other things which, he felt, had brought a permanent reduction in the severity of business cycles. In picking up another theme from *Production Trends in the United States since 1870*, he also noted the importance of product innovation in sustaining economic growth and thereby resolving the problems that had been seen by post-war Keynesian–stagnation theorists.

Burns went to Washington as a policy maker a second time, initially as counsellor to President Nixon, and then in 1970 as Chairman of the Federal Reserve Board. His tenure at the Federal Reserve covered the worst of the “stagflation” period, including the first oil shock, and was marked by great controversy not only over monetary policy but also the relations of the Federal Reserve to the Presidency, and in 1978 President Carter replaced him.

Burns’s close association with Nixon made it difficult to escape suspicion that policy was serving political interests, although the specific allegation first made by Rose (1974), that monetary policy was loosened prior to the 1972 election, was the most damaging. Evidence appearing later has continued to suggest that Burns either bowed to Presidential wishes or to threats of legislative reform to compromise the US Federal System’s independence. The pressure from the President, at least, is evident in Burns (2010).

The rational defence of the Fed’s actions at that time would be that the unemploy-

ment of the time called for a monetary stimulus, while the inflation should be treated as “cost-push” and dealt with by incomes policy and related measures – and the price freeze of August 1971 was clearly such a measure. Even in *Prosperity Without Inflation*, Burns was sympathetic to the existence of cost-push inflation, although he initially opposed the specification of a numerical standard for wage increases (see Burns, 1965). In the stagflation era, however, he was an outspoken proponent of the need for “incomes policy”. The statement of the position that attracted most attention was that of the “Pepperdine College Lecture” (Burns, 1970 [1978]) of December 1970, when he said that the inflation problem was no longer one of excess demand but was caused by cost and particularly wage increases. Even when it became conventional to regard incomes policy as ineffective, he continued to emphasize the limitations – both economic and political – on the capability of central banks to control inflation, as he did in the Per Jacobsson Lecture, entitled “The anguish of central banking” (Burns, 1979).

Regarded by some as a Republican lackey, or otherwise as an economic conservative, Burns should be remembered as an outstanding scholar of the American business cycle and a careful and broad thinker on political economy, whose reputation was done no favours by holding office in what was then the most difficult period of post-war history, during a time of the most difficult of the US Presidents.

JAMES FORDER

See also:

Federal Reserve System; Inflation.

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C

Capital controls

The 2008–09 global financial crisis has opened a new chapter in the debate over the proper policy responses to global capital flows. Until very recently, certain strands of the economics profession as well as industrialized countries' national governments and international financial institutions have remained either hostile or silent towards regulating capital movements. However, capital flows were at the heart of the crisis that occurred in 2008–09, and were the source of significant financial fragility thereafter. Capital flows from emerging markets and developing countries with current account surpluses fuelled the debt binge that led to the crisis in the industrialized world. When the crisis hit, there was a sudden stop in capital flows to emerging markets and developing countries. During the initial years of the recovery, capital flows surged into emerging markets as economic growth rates and interest rates were relatively low in the industrialized world.

A number of countries, including Iceland, Brazil, Taiwan, Indonesia, South Korea and others, have been experimenting with the re-regulation of capital flows during these turbulent times. Indeed, even the International Monetary Fund (IMF), long sceptical of regulating capital flows, has come to partially recognize the appropriateness of capital controls (as regulations on capital have traditionally been referred to) and has gone so far as to recommend that countries deploy them to mitigate the crisis and prevent further fragility (Grabel, 2011; Chwiero, 2013).

Regulations on capital flows – or capital controls – are limits on the level or composition of cross-border financial flows that enter or leave a country. They are often deployed to manage exchange-rate volatility, avoid maturity mismatches, limit speculative activity in an economy, and provide the policy-space for independent monetary policy. Measures often come in two varieties: price or quantity-based. Price-based measures alter the price of foreign capital, such as with a tax on inflows or outflows. Quantity-based measures require that a certain quantitative cap on certain types of capital flows be administered. A new generation of regulations was conceived in the wake of the crisis that occurred in the cross-border derivatives market and were used in South Korea, Brazil and elsewhere, which has become a key channel for global capital flows (see Ocampo et al., 2008; Gallagher, 2014).

In economic theory, a “new welfare economics” of capital controls has arisen. In this view, unstable capital flows to emerging markets can be viewed as negative externalities on recipient countries. Therefore, regulations on cross-border capital flows are tools to correct for market failures that can make markets work better and enhance economic growth, rather than worsen it (Korinek, 2011). According to this research, externalities are generated by capital flows because individual investors and borrowers do not know (or they ignore) what the effects of their financial decisions will be on the level of financial stability in a particular nation. A better analogy than protectionism would be the case of an individual firm not incorporating its contribution to urban air pollution. Whereas in the case of pollution the polluting firm can accentuate the environmental harm done by its activity, in the case of capital flows a foreign investor might tip a nation into financial difficulties and even a financial crisis. This is a classic market failure

argument and calls for what is referred to as a Pigouvian tax that will correct for the market failure.

On the empirical front, the literature now demonstrates that capital account liberalization is not strongly associated with economic growth and stability. Jeanne et al. (2012) conduct a sweeping “meta-regression” of the entire literature and find little correlation between capital account liberalization and economic growth. They conclude that “the international community should not seek to promote totally free trade in assets – even over the long run – because free capital mobility seems to have little benefit in terms of long run growth and because there is a good case to be made for prudential and non-distortive capital controls” (Jeanne et al., 2012, p.5). There is also considerable work demonstrating that capital account liberalization is associated with a higher probability of financial crises (Reinhardt and Rogoff, 2010).

There is also now strong evidence that capital controls can help manage exchange rate volatility and financial fragility. At the same time as these theoretical breakthroughs, a consensus is emerging on the efficacy of capital account regulations. The majority of studies suggest that the capital account regulations deployed in the period from the Asian financial crisis until the global financial crisis of 2008–09 met many of their stated goals. In the most comprehensive review of the literature, Magud et al. (2011) analyse studies on controls on capital inflows and outflows, as well as multi-country studies. The authors conclude that “in sum, capital controls on inflows seem to make monetary policy more independent, alter the composition of capital flows, and reduce real exchange rate pressures” (ibid., p. 11). There are fewer studies on controls about capital outflows, comprising mostly studies of Malaysia’s 1998 outflows restrictions. In Malaysia, Magud et al. (ibid.) found controls “reduce outflows and may make room for more independent monetary policy” (ibid., p. 11). In the wake of the global financial crisis, Ostry et al. (2010) further confirmed this literature when finding that those countries that had deployed capital controls on inflows were among the world’s least hard-hit during that crisis.

KEVIN P. GALLAGHER

See also:

Capital flight; Financial crisis; Financial instability; International Monetary Fund; Sudden stops.

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Capital flight

The Latin American "lost decade" of the 1980s has been an important case study for researchers. During that period, Latin American governments had great difficulty in servicing their external debt. Argentinean, Brazilian, Bolivian and Peruvian economies experienced both stagnation and hyperinflation, while at the same time the private sector increased its accumulation of foreign-exchange reserves. A very similar situation repeated during the Russian and Argentinean crises of 1997 and 2001. The loans granted by the International Monetary Fund to these governments followed a similar fate: local elites hoarded most of the foreign exchange outside the country. What would have been the fate of Latin America had all that money been available to service external debts? Paradoxical situations like these were the main motivation of the literature on capital flight. (On the relationship between capital flight and Latin American debt crises, see Pastor, 1989.)

The definition of capital flight is an old question that goes back at least to the inter-war period. According to Kindleberger (1937), capital flight is that part of capital outflows motivated by political and economic risk.

In the modern literature, there are at least three alternative definitions of capital flight (Schneider, 2003). First, a "broad definition" that encompasses all short-term capital outflows by residents. Second, a definition that considers capital flight only as capital outflows associated with asymmetric risk, for example because regulations are more favourable to foreign capital; this definition implies that capital outflows by residents coexist with capital inflows by non-residents. Third, the "illegal transaction" concept of capital flight only takes into account illegal capital movements. These definitions, although more specific than Kindleberger's, are sometimes incomplete: capital flight involves more than illegal or short-term transactions.

Although the phenomenon is unobservable – because it is impossible to tell which capital flows are "normal" and which flows are "capital flight" – it is assumed to be widely prevalent in developing countries. Indeed, it is often said that it is easier to measure capital flight than to define it. However, there is no unique estimation technique; most scholars follow a more or less *ad hoc* procedure, by adding up different components of the balance-of-payment accounts (see Cumby and Levich, 1987; Dooley, 1988).

As regards the consequences of capital flight, it seems obvious that if all the money was reinvested in the local economy, the overall performance of the latter would be much better. Foreign exchange is a scarce asset in developing countries, and therefore capital flight limits the ability to finance the importation of essential capital goods into these countries. Private sector accumulation of large stocks of foreign assets, however, also undermines State regulation: the central bank becomes less able to conduct an independent monetary policy, tax collection becomes more difficult, and the democratic process in general is hampered, because the interest of wealthy people may shape the government's behaviour in order to avoid the withdrawal of funds. Some authors call this the "capital strike" (Epstein, 2005).

Can a central bank successfully fight capital flight? It seems impossible to stop capital flights without attacking the roots of economic and political instability. Capital controls, although very useful for dealing with undesired capital movements, do not work if the incentives to move the money away are too big. However, this does not mean that central banks can do nothing to help. Some countries have mitigated the problems associated with capital flight by avoiding negative real rates of return on domestic assets.

As regards Brazil and Argentina, two countries with a long history of political and economic instability, one can see that even during critical episodes, the Brazilian central bank has maintained a positive yield on private deposits by indexing nominal returns to inflation, while in Argentina the crises have caused severe income losses to private savers, whose perception is that buying foreign assets is the best way to preserve the purchasing power of their savings. In fact, data show that the stock of foreign assets of Argentina as a fraction of its GDP is bigger than it is in Brazil. Overall, a combination of capital controls and a positive real interest rate seems to be the best mix, as it helped developing countries to avoid capital flights.

EMILIANO LIBMAN

See also:

Capital controls; Financial crisis; Financial instability; International Monetary Fund; Negative rate of interest; Sudden stops.

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Capital requirements

Capital requirements, also referred to as minimum mandatory capital adequacy requirements, constitute the cornerstone of banking regulation in advanced and emerging economies. They are designed to ensure that banks and depository institutions more generally hold an adequate amount of capital to withstand losses on their assets during periods of stress. Against this backdrop, minimum capital requirements serve as a buffer to reduce the risk of banks becoming insolvent and thus unable to carry out their activities on an ongoing basis, eventually protecting depositors and taxpayers and fostering the stability of the financial system as a whole. Notice that in order to ensure their solvency and reinforce the confidence of depositors and investors, banks may voluntarily choose to maintain capital adequacy ratios above the regulatory minimum.

Since the implementation of the Basel I Agreements on capital adequacy in 1988,

minimum capital requirements applied to banks are “risk-weighted”, so that the level of capital that a bank must hold is specified with respect to the riskiness of its asset portfolio. For instance, the higher (lower) the risk profile of a bank’s credit portfolio (as indicated by the rating ascribed to the various assets by credit rating agencies or by the bank itself), the higher (lower) the amount of capital that the bank is required to set aside to absorb future unexpected losses (see Basel Committee on Banking Supervision, 1988, pp. 8–13).

Now, the outburst of the 2008–09 financial crisis has inflicted considerable losses to the whole banking sector. Following a massive depreciation of their assets, many internationally active banks, which prior to the crisis were in compliance with minimum capital regulatory requirements, were forced to write down a substantial portion of their assets, leading in some cases to an erosion of their capital base.

In order to promote a more resilient global banking system and prevent the recurrence of another systemic crisis, the Basel Committee on Banking Supervision (2011) agreed upon a set of measures (known as the Basel III Agreements), which can be summarized into two main areas. First, global banks should strengthen the quality and quantity of their capital base. To do so, Basel III introduces a more stringent definition of bank capital (especially of the Tier 1 component, which has the highest loss-absorbency capacity) and requires banks to hold an additional capital conservation buffer in excess of their minimum regulatory requirements, which can be drawn down as losses materialize. Second, the Basel III capital adequacy framework adds a macro-prudential overlay to the setting of regulatory capital requirements, as epitomized, for instance, by the introduction of the countercyclical capital buffer (CCB). This buffer, which can be increased up to 2.5 percent of risk-weighted assets at the discretion of national supervisory authorities, is aimed at protecting banks from periods of “excess aggregate credit growth [. . .] associated with a build-up of system-wide risk” (Basel Committee on Banking Supervision, 2011, p. 65). The macroprudential orientation of the CCB stems from the fact that buffer adjustments “breathe with the cycle”; that is to say, they take into explicit consideration the macro-financial environment in which banks operate rather than treating them in isolation – as was the case under the Basel II Accords, which were in force prior to the 2008–09 financial crisis.

While the Basel III reform has the merit of supplementing traditional micro-prudential regulation with a broader macro-prudential perspective, its contribution to systemic stability remains controversial. On the one hand, higher capital requirements could be effective in addressing systemic risk, both through the imposition of capital surcharges on too-big-to-fail banks (thereby internalizing the risk they pose to systemic stability) and the implementation of countercyclical capital requirements in times of excessive credit growth. On the other hand, however, the effectiveness of tightened capital requirements in promoting a more stable financial system hinges on two main factors. First, the riskiness of banks’ assets must be correctly measured. In this respect, one of the leading assumptions behind the Basel methodology is that the risk of any specific asset (or pool of assets) can be modelled and objectively measured by means of sophisticated quantitative risk management techniques (often relying on past data), and that this measure can then be used as an input for computing banks’ capital requirements. However, as plainly exemplified by the 2008–09 financial crisis, the risk inherent to an asset is hardly measurable and can increase very suddenly, especially during times of market stress. This point

brings to the fore the fundamental distinction between risk and uncertainty, highlighted by Keynes (1936 [2007]) and central to the post-Keynesian analysis, according to which uncertainty cannot be reduced to a truly quantifiable risk by means of any computational techniques (see also Davidson, 2006).

Second, even assuming that risks are properly measured, banks may circumvent increased capital adequacy requirements by transferring some of their (riskiest) assets off their balance sheets to *ad hoc* created entities in order to maintain their profitability (the so-called boundary problem in financial regulation; see Goodhart, 2008). If this is the case, then higher capital requirements may even (perversely) lead to an increase in bank lending, especially as, in an endogenous-money framework, banks do not have to dispose of a relevant amount of deposits to lend to any kind of economic agents.

All in all, instead of insisting on imposing higher global minimum capital standards, policy makers ought to better strengthen their efforts to implement deep structural reforms aimed at addressing banks' multifunctionality and excessive bank lending, which lie at the root of systemic risk and impinge negatively on financial stability (see Panzera and Rossi, 2011, pp. 321–3). A major step in this direction would be to reform the banks' bookkeeping structure, which, to date, does not disentangle the two main functions performed by banks; that is, the “monetary function” and the “financial intermediary function”, and thus lacks an operational separation between money and credit (see Rossi, 2007).

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See also:

Asset-based reserve requirements; Basel Agreements; BIS macro-prudential approach; Financial crisis; Financial instability; Money and credit.

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Carney, Mark

Mark Carney (1965–) is a Canadian banker who in 2013 became the 120th Governor of the Bank of England. He is the first non-Briton to hold that position. Prior to this appointment, Carney served (from 2008 through 2013) as the eighth Governor of the Bank of Canada. His actions during the 2008–09 global financial crisis are widely believed to have helped Canada avoid its most severe consequences.

Carney was educated in economics at the Universities of Harvard and Oxford. He worked for 13 years for Goldman Sachs in several locations and capacities, including managing director for investment banking. In 2003, he began a career in public service in Canada. He was appointed as a Deputy Governor of the Bank of Canada in 2003, and then seconded by the Canadian Department of Finance (in 2004) to serve as Senior Associate Deputy Minister. In that position he handled several delicate files, including income trusts (flow-through investment vehicles designed to avoid corporate taxes) and the 2007 freeze in Canada's asset-backed commercial paper market. He was appointed Governor of the Bank of Canada, replacing the retiring David Dodge, beginning in February 2008.

The global financial crisis was already gathering momentum as Carney took office at the Bank of Canada in 2008. Canada's banking system entered the crisis in a stronger position than those of many other OECD countries, for several structural reasons (Stanford, 2012). The Canadian banking industry is highly concentrated (the five largest banks account for over 85 percent of all bank assets in Canada) and strongly profitable (earning a return on equity consistently higher than the economy average); hence the banks were well capitalized. Canadian banking regulations are incrementally stronger than other countries', including the application of a global leverage ratio limiting banks' total assets to no more than 20 times equity capital. The system is further stabilized by several public institutions, including the Canada Deposit Insurance Corporation (which provides automatic deposit insurance) and the Canada Mortgage and Housing Corporation (which guarantees and sets quality standards for most mortgages in Canada). Mergers and foreign takeovers of the major Canadian banks are prohibited. Finally, the culture of Canadian banking is more cautious than in the United States or Europe – perhaps because of the stable, consistent profitability banks have enjoyed.

Nevertheless, Canadian banks experienced losses from asset markets in the United States and Europe, and were seriously threatened by the collapsing confidence that destroyed banks in other countries. Carney moved quickly to address the crisis, through several channels. He reduced the Bank of Canada's target interest rate quickly as the crisis emerged (moving faster than many other central banks): from 4 percent when he took office, to 1.5 percent by the end of 2008, and then to 0.25 percent (the effective lower bound) by April 2009. The Bank of Canada implemented an emergency liquidity programme to assist banks, involving at peak 41 billion Canadian dollars' worth of emergency loans (nominally backed by assets, on unconventional terms; see Zorn et al., 2009). These liquidity injections were supplemented by similar actions by the Canadian government (through an Emergency Financing Framework programme; see Department of Finance, 2009) and by Canadian access to liquidity support (valued at 31 billion Canadian dollars at peak) from the US Federal Reserve (MacDonald, 2012). With the interest rate at its lower bound, Carney developed other channels for monetary stimulus as the recession deepened. The Bank of Canada prepared a mechanism for quantitative easing (involving unsterilized purchases of government bonds), although it was never implemented. Carney also pioneered a new strategy of "conditional commitment", whereby the Bank of Canada committed (in April 2009) to maintain the interest rate at its lower bound initially for at least one year (conditional on inflation). He hoped that an explicit indication of the Bank of Canada's intentions would reduce interest rates across

the spectrum of assets (He, 2010). Another reform under Carney's watch was the subtle amendment of the Bank of Canada's inflation target mandate (jointly agreed with the federal government) to give it more "flexibility" in the pursuit of that target (2 percent, plus or minus 1 percentage point). The addition of the term "flexible" to the formal mandate is widely interpreted as allowing the Bank of Canada to give more weight to GDP growth, employment, and financial stability in determining its monetary policy.

Thanks in part to these interventions, no Canadian bank collapsed during the 2008–09 crisis. The Canadian economy experienced a significant recession anyway, led by contraction in business investment and exports (offset by a substantial but temporary expansion in government spending). Real GDP began recovering in mid 2009, although progress was slow and uncertain. By mid 2010 the emergency liquidity supports provided by the Bank of Canada to commercial banks had been fully repaid. In June 2010 the Bank of Canada became one of the first central banks in the world to increase interest rates after the crisis, boosting its target to 1 percent over the next three months. That may have been premature, however, as various economic headwinds stalled growth. One major inhibitor was a strongly overvalued Canadian dollar: partly the result of Canada's booming petroleum industry, but exacerbated by rising Canadian interest rates. Carney (2012) acknowledged the dollar's negative impact on Canada's trade performance, but remained steadfast that the Bank of Canada (unlike several other central banks) would not directly influence the exchange rate. Carney also spoke out regularly on broader economic issues, such as his concern with excess consumer indebtedness, and his disappointment at weak capital spending by Canadian businesses (producing large corporate cash balances that he famously termed "dead money"; see Carmichael et al., 2012). Carney's media profile became very high, a development that was said to annoy the Finance Minister. He was even courted (unsuccessfully) to run for leadership of the Liberal Party of Canada (which was in opposition during Carney's tenure).

The relative stability of Canada's banking industry enhanced Carney's international stature. He was appointed to a three-year term as Chair of the Financial Stability Forum in 2011 (a position he carried with him to the Bank of England). The Chancellor of the Exchequer in the United Kingdom, George Osborne, in announcing Carney's nomination as new Bank of England Governor in November 2012, called him "the outstanding central banker of his generation" (Sculthorpe, 2012). Carney began his new role in London on 1 July 2013. His early actions included various forward guidance strategies aimed at convincing financial markets that interest rates would remain low for an extended period (thus stimulating faster investment and growth), informed no doubt by the apparent success of these techniques in Canada. UK growth picked up notably in the first years of Carney's tenure, although how much of that was due to his policy approach is unclear. In coming years Carney's policy interventions will also have to reflect lingering stagnation in the euro area and the contractionary impact of domestic fiscal austerity.

JIM STANFORD

See also:

Bank of Canada; Bank of England; Effective lower bound; Financial crisis; Forward guidance; Inflation targeting; Investment banking; Quantitative easing.

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Carry trade

Financial globalization has confronted central banks with carry-trade activities. These are cross-currency strategies that seek yield gains through leveraged borrowing at low interest rates in the funding currency to invest in high-yielding currencies (the Japanese yen–Australian dollar was a famous carry pair before the collapse of Lehman Brothers on 15 September 2008).

A carry trade is a risk-trading practice *par excellence*. Carry profits are wiped out if the target currency depreciates suddenly or if funding conditions change suddenly (see Brunnermeier et al., 2008). When confronted with such scenarios, carry traders exit rapidly and, in doing so, they put further depreciating pressure on the target currency.

Research identifies two carry-trade strategies. One involves exchanging the funds borrowed in the spot currency market in order to hold high-yielding assets in the target currency, in the form of bank deposits or tradeable domestic assets (Galati et al., 2007). However, investors need not get exposure to domestic assets. Through derivative instruments, carry traders can take positions that bet on future movements of the target currency (Kaltenbrunner, 2010). There are clearly pro-cyclical effects: increasing demand for domestic assets during boom times and rapid price falls when carries unwind.

Financial actors engage in carry trades depending on their risk preferences, ability to mobilize leveraged funding, and access to assets in the target currency. Banks resident in the country of the target currency become key nodes in carry-trade networks. Indeed, one important development that has contributed to the rapid proliferation of carry trades is changing business models in banking. Departing from the traditional relational banking model, banks in open financial systems have become complex conglomerates that undertake proprietary trading, market making, and asset–liability management. Thus, banks resident in high-yield countries can engage in carry trades directly through proprietary trading, if they have access to cross-border funding (see Galati et al., 2007). Alternatively, resident banks lend the target currency to non-resident investors (hedge funds, global

banks, real money funds, and so on) or enter derivative transactions with non-residents, earning profits from arbitraging the spot/forward rates (see Fritz and Prates, 2013).

Another well-documented carry-trade activity involves the central bank directly through its sterilization operations (see Gabor, 2012). If the central bank responds to excessive capital inflows with sterilized reserve accumulation, banks often treat sterilization instruments as a carry-trade target asset. In this case, sterilized currency interventions have perverse effects, increasing capital inflows and pressures on the exchange rate.

Given the key role of domestic banks as nodes in carry-trade networks, carry-trade activity strengthens the interconnectedness of markets and actors. It connects currency markets to interbank money and asset markets; and all these to stress in key financial centres such as London or New York. Paradoxically, however, central banks encounter serious difficulties in measuring carry-trade activity (see Galati et al., 2007). Data on individual transactions motivated by cross-currency trading strategies are not readily available. Data on net positions in carry pairs on currency futures markets provide only a partial picture since large carry players, such as hedge funds, prefer over-the-counter transactions, mostly off balance sheet. Conversely, carry-to-risk ratios only reflect the attractiveness of a given carry trade (*ex-ante*, risk-adjusted profitability) but not actual carry volumes (Curcucu et al., 2010). Balance-of-payments statistics are ill-suited to provide the real-time data necessary to monitor such short-term trading strategies. Indeed, the global financial crisis that erupted in 2008 illustrates an asymmetry of measurement: it is easier to gauge the magnitude of carry trades when these unwind by observing the simultaneous exchange-rate depreciation and rapid falls in asset prices.

The United Nations Conference on Trade and Development (2007) and the Bank for International Settlements (see Galati et al., 2007) first highlighted the difficulties that carry trades pose for central banks. Carry trades divorce exchange-rate movements from international trade activities. Instead, short-term capital flows driven by speculative intentions contribute to exchange-rate appreciation. Currency dynamics depend on policy choices in key financial centres that provide funding currencies (see Gabor, 2012). This highlights the consequences for central banks in high-income countries, as their efforts to stimulate lending with low interest rates and unconventional liquidity injections may instead spill over into the asset markets of high-interest rate countries. Further, central banks have limited tools to measure and monitor the extent of carry-trade activity even though there is increasing evidence that carry trades contribute to systemic risk because of increased interconnectedness, cross-border exposures, and larger swings in financial cycles (see Hattori and Shin, 2009).

Regulators are less likely to constrain carry trades during good times, because these improve the liquidity of domestic asset markets, easing funding constraints for the economy. When concerns for exchange-rate volatility and financial instability trump the drive for financial deepening, central banks tend to tighten regulation. One avenue is to impose residency-based capital controls that either increase costs of carry (such as a withholding of tax on non-resident purchase of domestic assets, including sterilization instruments) or constrain outflows (for example, Ukraine introduced waiting periods for non-residents to convert the proceeds from sale of domestic assets in 2008). Alternatively, central banks can place restrictions on resident banks' transactions with non-residents (on derivative markets) and on their proprietary trading. The stigma attached to

such measures reduced considerably once the International Monetary Fund officially endorsed capital controls in 2010.

DANIELA GABOR

See also:

Asset management; Capital controls; Capital flight; Financial instability; Liability management; Sterilization.

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Cash

Cash is commonly understood to be the physical form of money. While a vast array of physical items has been used in order to physically express money in the past, banknotes and coins are the predominant forms existing today. Bank deposits recorded on the liabilities side of banks' balance sheets are the original form of income that grant purchasing power to their holders. A banknote, on the other hand, is the physical acknowledgment that its holder is the owner of part of the central bank's liabilities. Banknotes therefore do not add to the bank deposits held by the public, but are a claim on existing bank deposits recorded on the liabilities side of central banks, commonly under the title "currency in circulation".

Before the advent of central banking, private banks issued banknotes. Today, central banks issue banknotes, while treasury departments issue coins in several countries. Importantly, central banks do not issue banknotes by purchasing output or financial assets with freshly printed banknotes, as observers sometimes maintain. This is, of course, illegal in any financial system that adheres to the basic principles of banking. Instead, every purchase of the government or the central bank must be financed with income sooner or later. While governments receive their income mainly by means of taxation, central banks earn it for the most part in the form of net interest payments or fees. This income is paid to central banks in exchange for the provision of a variety of services to the wider banking system, such as financial intermediation or the supply of central bank money for settlement purposes between member banks.

The book-entries that result from the emission of banknotes by central banks are

Table 2 The results of an emission of banknotes or coins

Central bank			
<i>Assets</i>		<i>Liabilities</i>	
Deposit with a commercial bank	+£x	Currency on issue (banknotes)	+£x
Commercial bank			
<i>Assets</i>		<i>Liabilities</i>	
Cash (banknotes)	+£x	Deposit of central bank	+£x

Source: Rossi (2007, p. 86).

illustrated in Table 2. In order to receive banknotes from the central bank, a commercial bank must transfer to the central bank equivalent claims on bank deposits. The central bank then physically transfers banknotes, which themselves represent the central bank's acknowledgement of debt. Neither is the central bank's physical currency purchased by the commercial bank, nor is the purely scriptural claim on the commercial bank's deposit purchased by the central bank in this blank operation. Instead, the two banks exchange a scriptural claim on a bank deposit for a physical claim on a bank deposit, leading to a reciprocal indebtedness confined to the banking system. As Rossi (2007, p. 85) points out, "[t]he emissions of bank notes and coins serve merely to allow for the substitution of one [immaterial] form of financial claims for another [material]".

Table 3 illustrates what happens when the commercial bank's client withdraws banknotes from the automatic teller machine. As soon as the client withdraws banknotes, she transforms "an immaterial claim on income [£x] into a paper-based representation of it [banknotes]" (ibid., p. 87).

The emission of coins works analogously to the emission of banknotes, despite coins being issued by the treasury in many cases (see Gnos and Rochon, 2002, p. 49 or Rossi, 2007, p. 87 for elaboration on this point). In contrast to the popular fiction of "helicopter money" (Friedman, 1969, pp. 4–5) and similarly simplistic conceptions of the money creation process that persist despite their open contradiction with reality, the amount of notes and coins in circulation is entirely determined by the public's demand to effect payments using physical representations of income. If the general public chooses, for whatever reasons, to abolish the use of cash in the near future, this would change nothing substantially about the functioning of the financial system.

OLIVER SIMON BAER

Table 3 The results of a withdrawal of banknotes or coins from a bank deposit account

Commercial bank			
<i>Assets</i>		<i>Liabilities</i>	
Cash (banknotes)	-£x	Deposits D	-£x

Source: Rossi (2007, p. 86).

See also:

Amsterdamse Wisselbank; Bank deposits; Bank run; Central bank money; Money creation; Settlement balances.

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Central bank as fiscal agent of the Treasury

Throughout history, central banks have had a close working relationship with the Treasury of their country. While this cooperation changed with economic and political circumstances, the Treasury and central bank usually have worked together to promote economic and financial stability. The role of the central bank as a depository and fiscal agent of the Treasury is a central part of this close cooperation.

Today, as depository and fiscal agent of the federal government, a central bank provides and manages a bank account for the Treasury. It monitors expenses and receipts to ensure that overdrafts do not occur (technically a central bank could provide an overdraft but the law usually forbids it). It collects and settles payments made to the Treasury (taxes, licenses, fines, and so on) and it clears checks drawn on the Treasury's account. The central bank is also responsible for the overseeing of the Treasury's transactions related to the public debt and to interventions in foreign-exchange markets. It oversees the bidding process, delivers treasuries to the bid winners, and credits the proceeds to the Treasury's account. It also redeems maturing treasuries, pays coupons, and oversees refinancing operations (Federal Reserve Bank of St Louis, 2004).

While the provision of basic financial agency services by the central bank is uncontroversial, the extension of this duty to the direct financing of the Treasury has not been. Even open-market operations that involve outright purchases of treasuries in the secondary market have sometimes been controversial.

Most early central banks were created to provide direct financial support to the Crown, but the growth of democracy was accompanied with a growing reluctance to allow such direct financing (Capie et al., 1994). However, during trying times such as wars or deep financial crises, direct financial help to the Treasury has been provided. For example, the 1914 Federal Reserve Act did not forbid such direct financing until a 1935 amendment to Section 14. However, at the request of the Federal Reserve, the 1942 Second War Powers Act removed the 1935 prohibition, subject to reapproval by Congress every two years; and Congress did so until 1979. During World War II, the Federal Reserve also continuously purchased treasuries in the secondary market to set the entire treasuries yield curve. Political tensions between the Treasury and the Federal Reserve emerged at the end of the war and ultimately led to the 1951 Accord that freed the Federal Reserve from the need to keep treasuries rates low. Quantitative easing is another example of similar yield curve targeting, albeit not as strong as during World War II (Tymoigne, 2014).

In normal times, the central bank may also participate in treasuries auctions in order to maintain the stability of the treasuries market. For example, currently the Federal

Reserve is not a net buyer of treasuries in the primary market but it does buy treasuries directly from the Treasury to replace those that are maturing in its portfolio, which provides a stable refinancing source for the Treasury. Until the 1970s, unsuccessful offerings of bonds and notes were common and the Federal Reserve had to be the net buyer of last resort (Garbade, 2004). Today, the central bank makes sure that primary dealers have the funds they need in order to make a treasuries auction successful.

While uncontroversial in the United States, the European Central Bank (ECB) has avoided outright purchases in the secondary market in normal times. It could have done so from its inception, but German ECB members saw this as an implicit bypassing of the prohibition of direct financing of public spending. The 2010 euro-area crisis forced the ECB to change its position, first unconditionally in a limited way through the Securities Markets Programme (SMP) in 2010, and then conditionally in an unlimited way through the Outright Monetary Transactions programme in 2012 (Coeuré, 2013). The adoption of the SMP triggered the resignation in 2011 of Jürgen Stark, the German member of the ECB Executive Board, and Axel Weber, President of the German Bundesbank.

In conclusion, throughout history the relationship between the central bank and the Treasury has always been one of mutual support. Both have aimed at maintaining the stability of the financial system in which the federal government plays a central role. While the politics surrounding this close cooperation between the Treasury and the central bank has sometimes been heated, the economics has been straightforward and is well understood by insiders (see Snyder, in US Senate, 1952; MacLaury, 1977; Meulendyke, 1998; and Newman, 2013).

ERIC TYMOIGNE

See also:

Chartalism; European Central Bank; Federal Reserve System; Modern Money Theory; Open-market operations; Outright Monetary Transactions; Quantitative easing; State money; Yield curve.

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Price Stability and High-Level Employment. Replies to Questions and Other Material for the Use of the Subcommittee on General Credit Control and Debt Management, Part 1, 82nd Congress, 2nd Session, Washington, DC: Government Printing Office.

Central bank bills

Central bank bills (CBBs) – also known as central bank securities or central bank bonds – are usually short-term (up to a year) financial instruments issued by a country's central bank or monetary authority to commercial banks. CBBs are primarily issued for a range of monetary policy purposes and exchange rate regulations, and are also used as a primary means of reducing excess liquidity (via reserves management).

While known to exist in various forms much earlier in monetary history, CBBs have found their widest application in developing and emerging markets in recent years, following a series of currency crises in the 1990s and most recently in the post-2008 crisis quantitative easing environment. CBBs may be used in conjunction with or in place of more typical liquid government securities (for instance Treasury bills, preferred in advanced economies) in a central bank's routine open-market operations. As such, CBBs are an increasingly important alternative monetary policy instrument.

The scope of CBBs is quite extensive, with both advanced and developing economies resorting to this instrument at different times (see, for example, Bank for International Settlements, 2009, 2013; Rule, 2011; Nyawata, 2012; and Yi, 2014), though advanced economies mostly rely on government-issued securities for their open-market operations. A variant of CBBs can be used to finance a central bank's foreign reserves fund. For example, the Bank of England is known to have issued its own securities (euro and US dollar denominated) for such purposes. A similar approach, via a subsidiary, was adopted by Malaysia right after the 1997 Asian crisis. The Bank of Korea has used Monetary Stabilization Bonds (MSB) since 1961 as its primary means of absorbing excess capacity in the market (see Rule, 2011 for details).

As a liquidity management tool, the People's Bank of China (PBC), in 2003, started issuing short-term CBBs with up to a year in maturity. This policy has been maintained with successive reissuance, as a means to drain liquidity rather than monetary policy tightening. Importantly, targeted CBBs were issued for isolated commercial banks that saw high credit growth and liquidity levels on a relative scale. It is estimated that the PBC was able to sterilize up to 80 per cent of the liquidity increase between 2003 and 2007 (Bank for International Settlements, 2009).

In the post-2008 crisis quantitative easing policies' proliferation, Switzerland (in 2008) and Malaysia (in 2011) started issuing CBBs, used as eligible collateral by respective banks. At the same time, Argentina's central bank (in December 2013) started issuing 180-day maturity CBBs targeted at grain exporters in an effort to accumulate foreign reserves ahead of crop deliveries, with restrictions on resale and specific terms of bond redemption.

In principle, accumulated evidence suggests that CBBs have been used for open-market operations as a sterilization instrument and liquidity management, mainly in economies with limited volume or non-existent government securities markets. The latter's limited

scope may be explained by smaller capacities and rudimentary fixed income markets (for instance, in post-socialist transition economies), perhaps even owing to governments' reluctance to issue debt in excess of immediate financing needs.

Therefore, lacking access to sufficiently robust short-term government securities markets, central banks rely on their own short-term fixed income paper for conduct of open-market operations. Yi (2014) cites the example of Brazil, where both the Treasury and the central bank issued individual bills up to 2002, when the central bank stopped the practice, thus allowing domestic sovereign bond market development. The Treasury continued issuing equivalent bills once original CBBs expired.

In another scenario, CBBs offer clear operational flexibility in conduct of monetary policy, distancing the central bank's involvement from sovereign debt management issues and focusing more on monetary management. The policy of using CBBs could also be linked to economic development efforts as liquidity initially expands artificially to stimulate economic growth. With increased loan portfolios and expanding foreign exchange flows, which also have repercussions on competitive exchange rates, as the economy gradually opens up but with still limited government securities market, the use of CBBs as an open-market operations mechanism may be justified to alleviate the pressures and drain excess liquidity.

Yet, even with relative autonomy in the conduct of monetary policy, CBBs pose certain immediate risks that have far wider and deeper ramifications for the national economies in developing rather than advanced markets.

One of the key risk factors is the interest that central banks pay on CBBs depending on the exact security structure. Over the years, excessive reliance on CBBs has put significant weakening pressures on central banks' balance sheets, in some cases leading to sizeable losses. Nyawata (2012) estimates such central banks' losses to have occurred in Poland (up to 0.8 per cent of GDP), Chile (1.4 per cent), Colombia (up to 0.7 per cent), as well as in Mexico, Indonesia, Malaysia and other countries throughout the 1990s. Persistent losses may even require a central bank's recapitalization, which by definition is a hard hit on the national economy.

Often the simultaneous use of CBBs and Treasury bills, issued by entities with identical credit ratings (that is, the national central bank and the government), brings on undesired market fragmentation and potential conflicts with fiscal debt management. Two bills with the same maturity resulting in different yield curves could lead to securities markets price distortions and backfire with liquidity shortage (see Yi, 2014 for the example of South Korean MSB and Treasuries term structure of interest rates). This is evident from the central bank's dual role in the CBBs process: as a regulator allowing the market to determine the CBBs' interest rate, and as an issuer attempting to control the CBBs' price to minimize the costs.

In a situation of limited central bank reserves, reliance on CBBs in effect contributes to national debt levels, resulting in a real fiscal burden. In more complex scenarios, excessive CBBs lead to negative externalities on central banks via credit provisions to low-capitalized banks or significant exposure to currency revaluation risks via foreign-exchange fund maintenance or pegged exchange-rate policies.

Finally, in creating a new liquid asset (in this case, CBBs), a central bank may inadvertently cause liquidity to actually increase rather than decrease as intended. Such a scenario plays out if foreign (and domestic) investors consider the new security as an alternative

risk-free investment and stimulate its secondary market (hence the restrictions on secondary market transactions as cited above in Argentina).

More abstractly, CBBs help conceptualize monetary policy effectiveness in economic development.

ALEKSANDR V. GEVORKYAN

See also:

Collateral; Financial crisis; Open-market operations; Quantitative easing; Reserve requirements; Sterilization; Yield curve.

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Central bank credibility

For neoclassical economists, central bank credibility means avoiding high inflation rates degenerating into low economic growth and high unemployment rates (Barro and Gordon, 1983). A credible central bank fulfils its low inflation announcement, and agents believe its commitment to price stability. A central bank’s credibility is therefore measured by the difference between the central bank’s inflation plan and what the public believes about these plans (Cukierman, 1992), or, in the framework of inflation targeting, by the gap between inflation expectations (or current inflation) and the inflation target (Svensson, 2011).

Theoretical foundations of the neoclassical view of central bank credibility (see Barro and Gordon, 1983) are the vertical Phillips curve, the rational expectations hypothesis and the game-theoretic approach of time inconsistency: the central bank has private information on its type (“hawk” or “dove” on inflation) and plays a game against economic agents. A non-credible central bank plays a fooling game by violating its announced inflation target. It fools agents’ expectations to exploit the Phillips curve and boost employment, the cost being higher inflation (“inflation bias”).

For neoclassical economists, the central bank makes these non-credible announcements, because it is controlled by politicians trying to be re-elected by reducing employment temporarily. In this sense, a central bank lacks credibility when it is not independent from politicians. For neoclassical economists, this credibility problem gave rise to the “Great Inflation” in the 1970s, despite its unlikelihood as being the only cause of that phenomenon.

For neoclassical economists, credibility matters because a credible central bank benefits from a credibility “effect” or “bonus”: the output cost of a central bank’s disinflationary policy is reduced, and more generally the economic situation and monetary policy effi-

ciency improve. For neoclassical economists, the central bank can obtain this credibility bonus by announcing a credible disinflationary policy stance, and only the announcement of a quick disinflation (“cold-turkey” disinflation) is credible (Sargent, 2013). The “credibility effect” of this announcement is that agents believe in this announced disinflation policy and quickly adjust their expectations accordingly. This adjustment of agents’ expectations confers a credibility “bonus”: a credible central bank benefits from a disinflationary “free lunch” (at no cost to the economic system).

According to some members of the new neoclassical synthesis, the benefits of credibility go further (see Svensson, 2011). A credible central bank anchors inflation expectations, which consequently do not react to shocks. Therefore, owing to the credibility “bonus”, the impact of shocks on the economy is attenuated, and the central bank has flexibility to respond to shocks with no fear of inflating expectations. It follows the ultimate bonus of credibility: the inflation/output trade-off is dampened, and so are long-term interest rates, because the inflation-related risk premium vanishes.

Nevertheless, empirical evidence does not fully support these credibility “effects”, which are not necessarily offered by agents’ expectations (Hutchison and Walsh, 1998). In the real world, disinflation is usually not a “free lunch”: the cost of quick disinflation is measured by a “sacrifice ratio”; that is, higher unemployment rates and/or output losses generated as a result of disinflation policy. Also, in practice an inflation-focused credibility does not provide enough flexibility for a central bank to deal with large shocks and related inflation/output trade-offs. Inflation-focused credibility can even constrain central bank flexibility to respond to shocks, causing unnecessary social losses. A credibility/flexibility trade-off emerges thereby (Walsh, 2010).

In the mid 1990s the neoclassical credibility view of central banking was criticized, because time inconsistency was judged as outdated. A central bank’s credibility is thus no longer related to the political temptation to exploit the Phillips curve, but is often confused with transparency: a credible central bank has a clear communication and is therefore predictable. Blinder (2000) clarifies the notion of credibility, defining it as “matching deeds to words”: the public believes the announcement of the central bank. The correct terminology in this regard, however, is “confidence”, not “credibility” (Carré and Le Héron, 2006).

In the early 2000s, New Keynesians revived credibility, even if they did not retain the inflation-bias hypothesis. For them, contrary to neoclassical economists, credibility is not a game *against* but *with* agents’ expectations. Credibility is not a fooling game but a communication-signalling game. Communication therefore becomes a monetary policy instrument fostering (inflation, output, interest-rate) expectations by publishing a central bank’s forecasts of these variables.

For neoclassical economists, this credibility was unreliable, because communication was “cheap talk”, macroeconomic variables were persistent, and agents’ expectations were partly backward-looking. By contrast, New Keynesians defended (and continue to defend) forward-looking models with a credible central bank managing inflation expectations and controlled the current rate of inflation depending on its expected rate. Credibility becomes thereby “expectations management” (Woodford, 2003).

Under inflation targeting, central bank credibility is defined as the gap between inflation expectations and the official inflation target. In this regard, the underlying hypothesis by New Keynesians is still rational expectations, but with the New-Keynesian Phillips

curve. For them, as for neoclassical economists, credibility is crucial not *per se*, but because of its positive effects on the whole economic system, notably the reduced costs of maintaining low inflation rates and reduced economic fluctuations. Yet these benefits are model-dependent, and diminish with non-forward-looking agents.

New Keynesians envisage imperfect credibility when agents doubt the central bank's commitment to its inflation target, giving rise to imperfectly managed expectations. Besides, the Bank for International Settlements (see Borio and White, 2003) shows a "credibility paradox": by stabilizing the rate of inflation too much, the central bank gives agents a false sense of security, leading them to more risky behaviour that could degenerate into financial instability.

Monetarists, neoclassical economists, and more recently New Keynesians (Woodford, 2003) propose a pre-commitment to a monetary policy rule, because they judge non-credible a central bank under discretion (no commitment). In the real world, a rule valid during a large shock does not exist: *de facto* the commitment is conditional. For Rogoff (1985), credibility requires a personal commitment with a "conservative" central banker more inflation-averse than the whole society. This, however, generates a democratic deficit with a loss function different from society's. Credibility can also come from an institutional commitment to low inflation rates, via total central bank independence or putting the inflation target in the Constitution. The cost of this is an unaccountable central bank, and reduced flexibility with a quasi-unamendable Constitution. Credibility can be earned via a reputation or a long history of low inflation rates. The cost is a central bank trading-off low economic growth against low inflation rates to build its anti-inflation reputation. For New Keynesians, incentive-compatible mechanisms of delegation, a contract about the inflation target, or a dismissal rule on the central banker *à la* Walsh (1995) can also build credibility.

The Great Recession challenged the anti-inflation-oriented credibility of central banks. During financial crises, the monetary authority can be credible by announcing that it will do everything possible, even generating inflation to avoid deflation (Blinder, 2012). In fact, inflation is only one aspect of central banking: the US Federal Reserve, for instance, was created in 1913 to fight financial instability. Moreover, the financial crisis that burst in 2008 empirically confirms that a central bank's pre-commitment to a rule is not credible.

EMMANUEL CARRÉ

See also:

Central bank independence; Credibility and reputation; Financial crisis; Financial instability; Friedman rule; Inflation; Inflation targeting; Phillips curve; Rules versus discretion; Taylor rule; Time inconsistency.

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Central bank independence

Since the 1980s, we have witnessed a worldwide process of granting independence to an increasing number of central banks. Indeed, independence was the precondition for national central banks to join the European System of Central Banks in order for their countries to (eventually) join the euro area. The statute of the European Central Bank incorporates the idea of an independent central bank and even in many developing and emerging market economies such as Turkey, South Africa or Zimbabwe, central bank independence (CBI) has become a central issue of economic governance reforms (see Acemoglu et al., 2008). Up until the global financial crisis that erupted in 2008, central bank independence was part of what has been dubbed the “great moderation”: a reduction of inflation and output volatility since the 1980s allegedly due to structural market reforms, monetary reforms (including central bank independence) and “luck” (see Bernanke, 2012). Independent central banks appeared to be part of the solution to the time-inconsistency and political-business-cycle problems to which discretionary economic policy is prone.

Central bank independence relates to the restrictions imposed on a central bank to define and pursue its own policy goals. Accordingly, independence is a relative concept comprising different dimensions:

- (1) Goal independence refers to the fact that a central bank may choose its own objectives, may have to accept objectives given to it, or something in between.
- (2) Instrument or operational independence refers to the freedom for a central bank to choose among the monetary policy instruments under its control and to determine their calibration and timing that the central bank deems necessary in order to achieve its goals.
- (3) Financial and personal independence are also often mentioned in order to limit the potential for indirect channels of influence or subordination.

Many attempts have been made to measure the relative independence of central banks by producing composite indices such as the most commonly used CBI indices presented by

Grilli et al. (1991), Cukierman (1992), and Alesina and Summers (1993), ranging from 0 (subordinate) to 1 (entirely independent).

Policy interventions of a Keynesian type have always been confronted with problems that came to be known as time inconsistency and political business cycles. Economic policy makers such as central bankers might find themselves pursuing a sub-optimal monetary policy from the point of view of social welfare when they can freely choose their policy goals, might find themselves caught in a non-cooperative game with other policy makers pursuing interdependent policy goals, or may simply be pushed to act in favour of certain interests. Instrument independence and the assignment of a single goal (price stability as defined by a given inflation target) is seen as a device to credibly tie the hands of central bankers. Although monetary policy in mainstream economics is considered to be neutral with respect to real economic variables such as GDP growth and employment in the long run, short-run deviations from “natural” positions may be caused if nominal or real rigidities can be realistically assumed. Therefore, operational central bank independence (but not goal independence) will be associated with lower inflation rates and lower inflation volatility without any real cost; to wit, it comes as a “free lunch”. Many empirical studies supported these postulates, which became almost conventional wisdom in the 1990s.

From a heterodox point of view, central bank independence has received a more mixed welcome: while some authors (Wray, 2007) questioned the democratic legitimization of CBI, highlighting the fact that not all societal interests are equally represented in the governing bodies of central banks, others (Fuhrer, 1997) disputed the clear-cut correlation between CBI and price stability as well as the “free lunch” postulate. Yet others (Heise, 2009), building on the post-Keynesian postulate of money non-neutrality in the short run as well as in the long run, support CBI in principle because a credible, non-accommodating policy stance is the prerequisite for avoiding the economically least favourable non-cooperative Nash equilibrium in “policy games” with fiscal authorities and wage-bargaining actors. Moreover, an institutional setting – such as CBI – that helps to reduce the range of possible future events, including the valuation of goods, services and assets, must be seen as contributing to containing fundamental uncertainty (*ibid.*).

The era of the “great moderation” has come to an abrupt end with the global financial crisis that burst in 2008 and that independent central banks were not able to prevent. Although massive regulation failures appear to be closer to the origin of the global financial crisis than the actual conduct of monetary policy and its institutional basis, CBI has come under scrutiny again. Are independent central banks able and willing to pursue a monetary policy stance that allows for sustainable fiscal policies in the age of massively increasing public indebtedness? Or have central banks already effectively lost their operational independence?

It is not only during periods of crisis, however, that CBI has been challenged. One basic problem with the empirical work of the impact of CBI on inflation and real variables is that several methodological weaknesses in forming an adequate CBI index have been detected. Mangano (1998) mentions an “interpretation spread”, a “criteria spread” and a “weighting spread”, which heavily influence the robustness of the established empirical results. Further, the channel of causality has been challenged by indicating that price stability and CBI can both be attributed to social attitudes and cultural norms (Posen, 1998). Finally, a growing literature (see Iversen, 1999; Pusch and Heise, 2010) has pointed

out the link between institutional frames in interrelated policy areas such as monetary, fiscal, and wage policies. The impact of CBI on real and nominal variables, therefore, is not linear but depends on alternative regimes that form different market constellations.

ARNE HEISE

See also:

Central bank credibility; European Central Bank; Financial crisis; Monetary policy instruments; Monetary policy objectives; Time inconsistency.

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Central bank money

Central bank money is a liability on the balance sheet of the central bank that is held as a credit balance in the holder's account at the central bank or as a physical object and is denominated in units that are given the name that defines the currency. The sovereign political authority defines it as legal tender and entrusts the central bank with the power of issuing it as sole supplier.

As a physical object, central bank money is called cash or currency and consists of banknotes and coins (note that coins are typically issued directly by the treasury office of governments). Cash provides a means of extinguishing debt with no intermediary and is typically preferred for small-value payments when the transaction cost of alternative means is proportionally large or to prevent the tracing of transactions when parties desire anonymity of payment for privacy, tax evasion or other illegal reasons.

The quantity of cash outstanding at any given time includes cash in circulation held by the non-bank public and vault cash in banks' storage. This quantity is demand-driven: the central bank supplies cash to the banks to remove unfit notes and coins and to meet bank clients' requests. When banks need more cash to meet the public's demand, they

request it from the central bank and have their accounts at the central bank debited for that amount. When banks hold more cash than desired, they return it to the central bank, which in turn credits their accounts.

In countries where the banking system is sufficiently developed, cash is a less common settlement asset than bank deposits. As bank deposits (that is, commercial bank money) are a liability of banks, confidence in bank deposits lies in the ability of the banks to convert, upon demand, their sight liabilities into the liabilities of another bank and/or into cash at par. Depositors' confidence in banks' ability to fulfil this function depends on banks having access to central bank funding and, in cases of bank insolvency that prevent access to funding, by credible bank deposit insurance protection.

In the form of a credit balance, central bank money is a claim on the central bank that may be held only by a limited range of entities for which central bank accounts are available, typically including licensed banks, the government, foreign central banks and international financial institutions such as the International Monetary Fund. Credit balances are added (to wit, credited to holders' accounts) or drained (that is, debited from holders' accounts) exclusively in conjunction with each and every payment that the central bank makes to or receives from account holders. Any holder's balance is a settlement asset that can be used only with other authorized holders or directly with its issuer, namely the central bank. As cash circulates freely in the non-bank private sector, while credit balances do not, only cash in circulation is considered a component of the money supply.

The political authority may decide to peg central bank money to an asset such as gold or a foreign currency at a fixed price, thus making central bank money redeemable in the asset backing the currency at a fixed conversion price. When no commitment of this kind exists, central bank money is said to be based on a fiat paper standard.

Credit balances held by banks in their reserve accounts are called bank reserves. Accordingly, bank reserves are a component of overall credit balances at the central bank. Bank reserves are typically included in the monetary base, along with currency in circulation. Banks use these assets as settlement balances with other banks through the interbank funds transfer system or they loan them to other banks. Although the term "reserves" suggests the notion of funds set aside for future contingencies, banks use such reserves daily to fund payments that are typically many times larger than their outstanding overnight balances.

The overall amount of bank reserves varies in response to every payment banks make to or receive from the central bank or other non-bank holders of central bank money, notably the government. For example, government spending adds to bank reserves, while tax payments and newly issued government securities drain bank reserves. These operations, combined with banks' demands for banknotes, typically produce a reserves deficit of the banking sector *vis-à-vis* the central bank. This structural liquidity deficit can be further enlarged if the central bank imposes binding reserve requirements (Borio, 1997).

With a reserve deficit in the banking sector, the central bank can use its monopoly of the supply of central bank money to dictate the terms on which it is willing to relieve the shortage by lending central bank money (Allen, 2004). Likewise, holding central bank money may be costly to banks. If the marginal opportunity cost of holding overnight reserves – that is, the revenue forgone by a bank when it does not lend out its excess reserves – is positive, banks will aim to minimize their holdings of reserves with the central bank by end of day. Alternatively, if the central bank adopts a floor system, the

marginal cost of reserves is zero and banks become indifferent between holding reserves and lending them in the interbank market (Goodfriend, 2002).

Because it can supply bank reserves in any demanded amount, the central bank acts as the lender of last resort when banks are subject to a liquidity shock. This function of providing bank reserves, however, can be limited through collateral and borrowing constraints, as well as monetary financing prohibitions (Bindseil and Winkler, 2013).

When central bank money is backed by an asset that the central bank cannot supply in unlimited quantity, the latter can become a “safe haven” asset and the central bank itself can become subject to a liquidity shock. In such a situation, bank lending becomes constrained by reserves in the asset backing central bank money, and the central bank loses its discretionary power to fix the interest rate.

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See also:

Bank deposits; Cash; Fiat money; Lender of last resort; Money and credit; Money multiplier; Money supply; Reserve requirements; Settlement balances; State money.

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Chartalism

There are two main theories about the origin, and nature, of money. The first, mainstream, view proposes that money developed by a process whereby the private sector sought to minimize the costs of making exchanges whilst trading. This group of theorists tends to argue that the value of currency depended primarily, or solely, on the intrinsic value of the metallic backing of the currency. The second group of theorists (chartalists) argues instead that the use of currency was based primarily on the power of the issuing authority; that money was used initially for social, and legal, interactions, rather than as a substitute for barter in the course of trade; and that currency becomes money primarily because the coins (or monetary instruments more widely) are struck with the insignia of sovereignty, and not so much because they happen to be made of gold, silver or copper (or later of paper). Chartalists note both the difficulty of assaying the purely metallic value of a lump of (precious) metal, and the widespread monetary use of items, such as cattle, from which the word pecuniary is derived, whose characteristics are hardly conducive to facilitating day-to-day trade.

The mainstream team has assembled the more illustrious collection of economists (plus the endorsement of Aristotle, circa BC 340; and Locke, 1960), and has expressed its analysis in more formal and elegant terms, from the earlier economists such as Jevons (1875), and Menger (1892), von Mises (1934), Brunner and Meltzer (1971) and Alchian

(1977), on more recently to Kiyotaki and Wright (1989, 1993), plus a host of other eminent economists. Against them, the chartalist team has arrayed a more motley fringe group of economists, such as Knapp (1924) in Germany, Mireaux (1930) in France, and (most of) the post-Keynesians in the United Kingdom and United States. Nevertheless, as Mélitz (1974) and Redish (1992) have noted, the chartalist team approach has also received the support of a large number, probably a sizeable majority, of those in other disciplines – for instance, anthropologists, numismatists and historians concerned with the origin of money. A leading contributor in this group is Grierson (1977); also see Einzig (1949 [1966]) and Polanyi (1957). Whereas the mainstream group has been strong on formal theory, it has been constitutionally weak on institutional detail and historical empiricism.

The mainstream theorists would accept that there are costs of assessing the value of raw metal, but would argue that a combination of the innate characteristics of the precious metals, plus the identification cost reduction allowed by minting, enabled the private sector to evolve towards a monetary system. Again, however, that analysis is historically flawed. Although, once the idea and technical process is discovered, minting would seem to be as capable of being carried out within the private sector as any other metal-working process, in practice minting has, in the vast majority of cases, been a government, public sector, operation. Amongst the experts on the historical evolution of minting coins are MacDonald (1916), Grierson (1977, 1979) and Craig (1953). These authorities, in turn, refer to hosts of other earlier writers. In those cases where the mint has been run by the private sector, the government has in most cases both set the standards of fineness and extracted a rent, or seigniorage tax, that collected most of the available profits. This concentration of minting under the government's aegis is not accidental. There are two associated reasons why this is so.

First, a mint requires an inventory of precious metals. It will, therefore, act as a magnet for opportunistic theft and violence. It will require protection, and the protector (who wields the force necessary to maintain law and order in the economic system) will therefore be able to extract most of the rent from the system.

Second, the costs of identifying the true value (quality) of the metals included in the minted coin lead to time inconsistency. The mint operator is bound to claim that the quality will be maintained forever, but in practice will always be tempted to debase the currency in pursuit of a quick and immediately larger return. Olson (1996) has described how the development of a secure, dynastic regime reduces time inconsistency in the ruler (see also McGuire and Olson, 1996).

Few inventions are made by government bodies. This has also been so in the monetary field. The metallurgical developments and the invention of banknotes, in China and the West, came initially from the private sector, but money's initial role as a means of payment, for *wergeld*, bride price, religious occasions, and so on (which probably predated money's role as a medium of exchange), and its role in facilitating the fiscal basis of government, meant that government made the monetary process – for instance, the guarantee through minting of the fineness and at the outset of the weight of the coins – into a pillar of the sovereign state.

There is, as set out by Grierson, a further argument leading to the same conclusion. Society cannot work if violent behaviour is too prevalent. Some people will always be violent. An initial act of violence provokes revenge and a possibly endless feud.

Feuds destroy society. One early crucial function of money, *wergeld*, was to set a tariff, whereby (the relatives of) the initial offender could recompense the damaged party. This practice spread to other interpersonal relationships (bride price, slaves), in some cases before formal markets and the use of money in trade arose. Kleiman (1987, pp. 261–87) describes such compensations.

The governance structure of a society and the monetary institutions within it are, therefore, closely interconnected, as argued by chartalists. This has widespread implications, not least for the adoption of the eurozone single currency, as argued in Goodhart (1998). A key feature of the eurozone is that the link between the political authorities and the European Central Bank (ECB) has been weakened to a degree rarely, if ever, known before. A primary constitutional feature of the ECB is its absolute independence from government (at any level). Meanwhile, the political and fiscal powers of the various European institutions (Parliament, Commission, and so on) at the matching federal level are far weaker (than has been the case in other previous federal states). That, in itself, raises constitutional and political issues.

The thrust of the mainstream's theoretical analysis is that this divorce is all to the good; indeed, it is largely the purpose of the exercise. The blame for recent inflation has been placed on political myopia, via the time inconsistency analysis, and the ability of the political (fiscal) authorities to bend and misuse monetary powers for their own short-term objectives. While there is much truth and realism in this analysis, chartalists continue to worry about whether the divorce may not have some unforeseen side effects.

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See also:

Central bank independence; Central bank money; European Central Bank; Fiat money; Metallism; Money supply; State money; Time inconsistency.

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Chicago Plan

The Chicago Plan refers to a *memorandum* calling for a radical shift in banking regulation through the implementation of a full-reserve system – as a substitute of the fractional reserve system – for the banking sector. Issued in March 1933 and revised in November 1933, it was written by Knight (1933) and addressed to US President Roosevelt. It was summarized three years later by Fisher (1936). But in the aftermath of the Great Recession, the plan was set aside in favour of alternative measures encapsulated in the US Banking Act of 1935.

The Chicago Plan was revived years later and received some support, notably from Friedman (1960), who argued that it would have improved the monetary stability of the economic system as a whole. Recently, the Chicago Plan was again the subject of renewed interest, in particular owing to the work of Benes and Kumhof (2012), who calibrate a dynamic stochastic general equilibrium (DSGE) model to assess the effects of its implementation on the US economy. Following the subprime crisis of 2007, their work has become the reference for the proponents of a full-reserve system, notably several civil society movements across Europe (*Positive Money* in England, for instance), who called for giving the State the monopoly over the issuance of money.

The aim of the Chicago Plan was to ensure that banks grant credits only through "the borrowing of existing government-issued money from non-banks, but not through the creation of new deposits, *ex nihilo*, by banks" (Benes and Kumhof, 2012, p.4). Such a plan calls therefore for a full-reserve backing of bank deposits by government-issued money, and for a monetary growth rule to control the quantity of money in circulation. In this respect, such a rule determines the quantity of newly issued money injected, through public spending, within the economic system. Against this background, a given bank is able to grant credits only if economic agents (who receive money through public spending) deposit government-issued money within it. Consequently, banks cannot rely on the issuance of money to finance any credit: they have to collect deposits in order to lend. According to Fisher (1936) and Benes and Kumhof (2012), the Chicago Plan therefore has numerous advantages: to wit, a better control of the business cycle (banks do not fuel the credit cycle by issuing money); the elimination of bank runs (credits are backed by government-issued money); a reduction of public and private debts (the rate of interest on the government-issued money is equal to zero); and long-term output gains (the reduction of debts across the economic system leads to a decrease in the real rate of interest), as well as a drop in the rate of inflation (the monetary growth rule ensures the regulation of the supply of money).

Now, beyond the econometric estimations of Benes and Kumhof (2012), the Chicago

Plan is flawed on several counts. First of all, a well-known critique addressed to the monetary growth rule advocated by the Chicago Plan concerns the instability of the demand for money, which is now firmly established. When a central bank adopts a monetary targeting strategy, its monetary policy has to follow a pre-established rule as regards the supply of money. In fact, however, the latter is an endogenous magnitude: from a post-Keynesian point of view (see Moore, 1988), banks create deposits when they grant credits through the issuance of money. Contrary to what the proponents of the Chicago Plan maintain, banks are not constrained by reserves when they grant new credits. The problem when the central bank tries to pre-determine the supply of money for a given period of time is that it has to change its policy rate of interest (in order to influence the term structure of interest rates) in the case of an unexpected swing in the demand for money. Notably, the central bank increases (decreases) its policy rate of interest when such a swing occurs in order to rein in (stimulate) the demand for money and bring the “money market” back to equilibrium. As a result, an unstable demand for money causes, under a monetary targeting strategy, a high volatility of the policy rate of interest and, consequently, an instability of the term structure of interest rates, which is a major threat for monetary stability, as Volcker’s monetarist experiment in the United States showed during the 1980s.

On a more conceptual ground, the determination shown by proponents of the Chicago Plan to change the nature of money – that is, to make money an exogenous magnitude – reflects a dichotomous conception of the economic system. Indeed, the recommendations of such a plan (the implementation of a full-reserve backing of bank deposits by government-issued money and of a monetary growth rule) treat money as a commodity, which, like any other commodity, is produced and circulates within the economic system. This precludes any integration between money and products (it is a matter of metaphysics to integrate two commodities with each other). Against this background, the proponents of the Chicago Plan consider money through the law of scarcity fitted for commodities (a commodity has to be produced with factors of production whose quantity is limited). In other words, the Chicago Plan recommends a loanable-funds approach, according to which savings are scarce.

A better reform of the banking system has to consider the endogenous nature of money, without rendering the latter an exogenous magnitude. Indeed, money is a bookkeeping entry devoid of any purchasing power (note that monetary authorities cannot create any purchasing power when they issue money), unless it is associated with output through the payment of wages, as the monetary theory of production explains (see Graziani, 2003). Consequently, the reform of the banking system has to distinguish, in the spirit of Keynes (1930 [2011]), two kinds of banking intermediation: a monetary intermediation, whereby banks issue money (for the payment of wages by firms) to monetize production; and a financial intermediation, in which income – that is, the bank deposit (a financial claim) resulting from the remuneration of labour – is lent for non-productive purposes (see Rossi, 2007, pp. 126–32, for a structural reform regarding the partition of banks’ double-entry bookkeeping). Such a bookkeeping distinction avoids the issuance of money for speculative purposes (no money devoid of any purchasing power will fuel inflation on financial markets) without curbing the development of the economic system – as the scarcity of loanable funds implies.

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See also:

100% money; Banking and Currency Schools; Bank money; Bank run; Central bank money; Classical dichotomy; Commodity money; Endogenous money; Fiat money; Financial crisis; Financial instability; Fractional reserve banking; Free banking; Friedman rule; Glass–Steagall Act; High-powered money; Interest rates term structure; Monetarism; Monetary circuit; Monetary targeting; Money and credit; Money creation; Money creation and economic growth; Money multiplier; Money supply; Narrow banking; Reserve requirements; Volcker experiment.

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Classical dichotomy

The classical dichotomy (Patinkin, 1965) refers to the idea that real variables, like output and employment, are independent of monetary variables. In this view, the primary function of money is to act as a lubricant for the efficient production and exchange of commodities. This conception of money rests on “real analysis”, which describes an ideal-type economy as a system of barter between rational utility-maximizing individuals (Schumpeter, 1994, p. 277).

In this sense, money is “the unpremeditated resultant, of particular, individual efforts of the members of society, who have little by little worked their way to a determination of the different degrees of saleableness in commodities” (Menger, 1892, p. 242). Hence, money is considered simply as a social technology for the adjudication and determination of “terms of trade”, which are inherently specific to individual dyadic economic exchanges (Dodd, 1994, p. 6). It is thus a social “vehicle” that has no efficacy other than to overcome transaction costs concerning the inconveniences of barter, which result from the absence of a double coincidence of wants (Jevons, 1875, p. 3).

The classical dichotomy is, essentially, a derivation of the quantity theory of money, which is captured by the formula $MV = PY$, where M stands for the money stock, V is the velocity of money circulation, P is the price level, and Y is the level of income. The monetary value of output (PY) is thus equal to overall aggregate monetary expenditure. Exogenous changes in the money supply (M) ultimately condition the price level for a given level of economic activity. If an economic system is at full employment, the only effect of increases in the money supply is a proportionate increase in the domestic price level, which gives rise to a depreciation of its currency’s exchange rate. The direction of causality runs therefore from an exogenous money supply to the price level.

This is intrinsically connected to the so-called “natural rate of interest theory” of New

Keynesian economics (see Woodford, 2003). A natural rate of interest is determined in the long run by the equilibrium of savings and investment. This is a full-employment position for a given economy. A market interest rate that is either above or below this natural rate is a disequilibrium situation, which is eventually equilibrated through a long-run process of market clearing.

Exogenous changes in the supply of money are what shift market rates of interest. This is the process by which discrepancies between market rates and the natural rate of interest are generated. A market rate of interest below the natural interest rate occurs when investment exceeds savings. Firms will demand more credit for investing. The result is an excess of investment over savings. If the economy is at the full-employment position, defined by the natural rate of interest, a cumulative process of inflation unfolds. The rise in the price of consumption goods leads to a decrease in consumption; involuntary savings rise until the excess of investment over savings is eventually eliminated. If market rates of interest are above the natural rate of interest, by contrast, savings exceed investment and a cumulative process of deflation ensues.

From a heterodox perspective, however, the natural rate of interest is a conventionally determined exogenous distributive variable. The implication is that it is strictly a monetary phenomenon. For a given level of output, the price level is the result of distributive conflict between capitalists and workers. Hence, the net impact on the general price level depends on the effects the central-bank-determined interest rate exerts on aggregate demand. If a restrictive monetary policy, via higher market interest rates, leads to a higher price-to-wage ratio, a lower inflation rate will result if the workers' bargaining power is weakened, resulting in nominal wage reductions.

Further, if conventional rates of interest are artificially set high and effective demand is not sufficient for businesses to meet profit expectations, and for governments to afford deficit spending, there is an actual possibility of an unemployment equilibrium. Deflation that is caused by higher real interest rates does not produce a wealth effect that offsets increased costs of production through the expansion of consumption. This puts pressure "on those entrepreneurs [and consumers] who are heavily indebted [. . .] with severely adverse effects on investment" (Keynes, 1936, pp.262–4). If the interest rate is set low and is followed with appropriate fiscal policy via aggregate demand management, any so-called burden of private and public debt accumulation is sustainable, and, as a result, provides impetus for output and employment expansion (Domar, 1944).

In conclusion, the classical dichotomy implies that real variables and monetary variables are independent of each other. From a heterodox perspective, by contrast, both kinds of variables are explained by the relationship established between the central bank, bank lending, and entrepreneurs' "animal spirits" every time effective demand is deemed profitable, thereby reversing the causality of the quantity-theory-of-money formula.

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See also:

Money neutrality; Money supply; Natural rate of interest; Patinkin, Don; Quantity theory of money.

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Clearing system

A clearing system consists of a series of norms and coordinated processes by which financial institutions systematically collect and mutually exchange data or documents on funds or securities transfers to other financial intermediaries at an agreed place called "clearing house". These procedures can also involve the determination of participants' bilateral and/or multilateral net positions and aim at simplifying the discharge of respective obligations on a net or net net basis in a settlement system. Occasionally, the expression "clearing system" implies a mechanism of multilateral netting by novation and the settlement of the corresponding payments or, imprecisely, the process itself of settling transactions. Since their functioning involves "a moderate stock of solid Money [...] [while] a large proportion of both solid and paper Money might be spared" (Seyd, 1871, p. 5) and they naturally aim at "eliminating or reducing cash transfers" (Einzig, 1935, p. 66), clearing systems gained particular success in the nineteenth century.

In light of their revolutionary implications for central banking, clearing systems have been also defined as "the greatest of all economic financial machines" (Howarth, 1884, p. 3) or "the machinery that saved thousands of business concerns from ruin during panics and financial depressions" (Thralls, 1916, p. iii). In particular, at international level, several countries stipulated exchange clearing agreements to overcome shortages of gold and foreign currency reserves in the aftermath of the Great Depression in the early 1930s. International credits and debits recorded by each national clearing house were therefore cleared at the end of a given period of time and no foreign currency outflow occurred, unless the nation's net balance was negative. Only in the latter case would the debtor country have disbursed the sum exceeding the cleared amount.

Although clearing systems gained predominance in banking in the early nineteenth century, their historical origins remain rather obscure. They seem to go back to the foundation of the London Clearing House in 1773 or, according to some historiographers like Lawson (1850, p. 260), even to the year 1755 and to specific bank clerks called "clearers". Walk clerks' or collectors' duties in the second half of the seventeenth century were to collect sufficient liquidity from banks in order to cover banking instruments hoarded daily. Legend has it that some walk clerks eventually met in a coffee house and accidentally discovered that they held a similar amounts of receivables against the other's bank. Through exchanging and trading of these claims they saved time and established consolidated clearing procedures, "which would eventually become the centre for the exchange of banker's charges" (Matthews, 1921, p. 1). Despite clearing systems' remoteness in time,

their definition remains an ongoing process and any “detailed prescription of a specific payment system will be outdated rather quickly” (Heller et al., 2000, p. 1).

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See also:

Central bank money; Keynes Plan; Settlement balances; Settlement system.

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Collateral

The term “collateral” refers to a tangible asset or a secure financial asset, such as a government bond, which is used to guarantee a debt issued by the owner of the asset. The existence of collateral is intended to make the debt less risky, as the creditor has a legal claim on the asset in the case of default by the debtor. As such, collateral is fundamental to the smooth functioning of financial markets.

In this sense, collateral is part of a significant number of lending and borrowing transactions undertaken by market participants. For instance, source collateral is provided to investment banks by hedge funds and commercial banks directly, and by other financial market participants such as pension funds and insurers via their custodians (Singh, 2012). While the existence of collateral is crucial to the individual investor, particularly the creditor, collateral also plays an important role in the financial system at the macro-economic level, notably because source collateral is frequently re-pledged, which allows for the creation of collateral chains and hence an interdependent network of lending and borrowing transactions at the aggregate level.

Although this process adds to the so-called lubrication of the financial system, it also introduces an element of fragility, as became evident during the financial crisis of 2008–09.

For instance, the crisis that followed the collapse of the investment bank Lehman Brothers on 15 September 2008 led to a significant shortening of collateral chains as well as a fall in the velocity, or the rate of reuse, of collateral (ibid.), which further aggravated an existing liquidity shortage. In the aftermath of the 2008–09 financial crisis, concerns were also raised that the pool of collateral had shrunk owing to decreasing confidence in many governments' ability to honour their debt commitments. However, such thinking is flawed in the case of countries like the United States, because a government with

monetary sovereignty, and therefore a full capacity to issue its own currency as well as a willingness to honour its debt can never, by definition, be forced into default by any economic circumstance. The case of euroland provides greater room for debate, by contrast, as all euro-area member countries have relinquished their monetary sovereignty and thus the ability to independently issue their own currency.

Concerns with the role of collateral in propagating business cycles have greater validity and have benefited from significant attention in economic literature. In an economic downturn, as the price of both tangible and financial collateral falls, while simultaneously collateralization and margin requirements increase, potential borrowers find it ever more challenging to secure a loan. This process contributes to a hastier tightening of credit conditions, possibly aggravating and prolonging the economic downturn. However, the literature in this field must be considered with caution, as some models used to study this mechanism, particularly as regards monetary policy, use many assumptions that have been debased by recent developments in economic theory and the US experience during the financial crisis of 2008–09. Assumptions of exogenous money as well as significant changes in inflation rates and thereby in the redistribution of wealth between lenders and borrowers as a result of unanticipated monetary policy shocks (see, for example, Cordoba and Ripoll, 2004) are not only theoretically questionable, but have also been discredited by the monetary policy experience in the aftermath of the 2008–09 financial crisis. Nonetheless, in an economy with endogenous money – that is, where the quantity of money is determined in the process of credit provision – collateral is undoubtedly fundamental to understanding credit constraints and bank-based financial crises (Ramskogler, 2011).

The evolving role of collateral in many modern economies, such as that of the United States, is thus also crucial to the conduct of monetary policy by the central bank. The efficacy with which the banking system transforms otherwise illiquid assets into liquidity via collateralization in the absence of financial strain means that, when a financial crisis occurs, some of the central bank's traditional tools that aim to provide liquidity to the banking system prove inadequate. In some cases, policies traditionally viewed as expansionary, such as the purchase of government bonds in exchange for reserves at the central bank, prove contractionary, as the policy decreases the stock of valuable collateral (government bonds) that are an essential element in the liquidity creation process of the banking system (Williamson, 2011).

The transformation of the regulatory framework that began following the collapse of Lehman Brothers and the ensuing financial crisis, particularly in the over-the-counter financial products market (Bank for International Settlements, 2013), may lead to a collateral shortage in the long term (van Steenis et al., 2013). Such a collateral shortage, if it occurs, could be a significant drag on economic activity, as it will constrain the loan-creation process that is a fundamental driver of economic growth. On the other hand, over-zealous reuse of collateral, which leads to a masking of underlying risk and the creation of excessive leverage in certain sectors of the economy, was itself one of the fundamental causes of the 2008–09 financial crisis. At the peak of the crisis, the US Federal Reserve took a number of unprecedented steps to ease credit conditions and restore financial stability, with one such step involving a significant expansion of the list of collateral accepted under various loan programmes of the central bank. While this most likely contributed to the reparation of the functioning of financial markets across

the world, this measure along with others taken by the US central bank also sparked a debate as to whether the Federal Reserve had overstepped its mandate, entering into the realm of fiscal rather than monetary policy (Wray, 2012).

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See also:

Endogenous money; Federal Reserve System; Financial crisis; Investment banking; Open-market operations.

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Commodity money

A commodity is any good or service that is useful as an input in production or consumption and can be exchanged with other goods or services. The exchangeability of commodities presupposes the existence of a common element that makes them commensurable to each other. Classical economists argued that the common element contained in commodities is that they are products of labour. Hence, the quantity of labour time spent to produce any commodity becomes the measurement stick of its worthiness. Of course, there are differences and qualifications within this broad classical approach. For example, Marx's concept of abstract socially necessary labour time – that is, the labour time without its specific characteristics – is what gives worthiness to commodities.

Historically certain commodities, owing to certain useful attributes they possessed, became money commodities; that is, the means through which the other commodities can express their worthiness and in doing so become the medium for quoting prices. If gold, for example, is the money commodity, the other commodities express their worthiness in terms of a certain quantity of gold (for example, 1 US dollar = 1/4 ounce of gold). The value – to wit, the abstract socially necessary labour time – contained in a commodity, relative to the value of gold, gives the direct price or a first approximation of the monetary expression of value and a centre of gravity for observed (market) prices (Shaikh, 1980).

The function of money as a standard of price refers to the particular unit of gold

that is used to measure value. As a result, the measure of value and standard of price functions are not the same. The measure of value is the abstract socially necessary labour time contained in a commodity. The standard of price is a unit of weight (pound, gram, and so on). It is similar to the difference between distance and a meter. A meter is a unit of measurement and distance is the concept to be measured in meters. Historically, for instance, the British pound initially represented a quantity of silver weighing one pound (Marx, 1867, p. 99), and the US dollar also represented a certain weight of silver. With the passage of time, however, debasement separated the money names of these units from their actual precious metal content and gradually led to the determination of the standard by law.

The measure-of-value property of the money commodity may also make it the medium of exchange and thereby enable the generalization of commodity production, thus making possible the increasing specialization of labour and the associated increase in productivity and reduction in unit production costs and prices. History is replete with examples of commodities that played the role of money commodity. For example, in ancient times cattle, salt and copper, among other goods, served as mediums of exchange, and in more recent times even commodities such as cigarettes, under certain circumstances (such as in a prisoner-of-war camp), have also played that role. However, the money commodity in an economy of generalized market relations must possess the universal function of the general equivalent – that is, it must be the commodity through which the other commodities express their value – and so it must be characterized by a number of useful properties (it must be easily recognizable, divisible, transferable, durable, and so forth). Precious metals, more than other commodities, possess these required properties and for this reason have become the means that can effectively perform the functions of the universal or general equivalent commodity.

Fiat money is a form of money without intrinsic value and is instituted as such by the State. Contrary to commodity money, fiat money is exchanged against commodities (or gold) at the market price, whereas token (commodity) money is converted into gold at a specified price. Commodity money in the form of gold coins appeared for the first time in the sixth century BC in Greece and Asia Minor, and approximately in the same period in East Asia.

In modern times, fiat money in its paper or more importantly in its bookkeeping form renders commodity money literally a “barbarous relic” according to Keynes’s characterization of money backed up by gold. On further thought, however, commodity money, in one form or another, was officially present up until 1971, when the currencies of IMF member countries (according to the Bretton Woods agreements signed in 1944) were convertible into US dollars and US dollars in principle were convertible into gold at the ratio of 35 US dollars to an ounce of gold. To the extent that economies were in a growing stage, there were no problems with the extension of credit and the expansion of forms of fiat or quasi-fiat money. However, in a long-lasting recessionary period (such as the period that started at the end of the 1960s and lasted until the early 1980s) the function of money as a store of value requires more urgently the physical presence of money and this could not be different from its commodity form. As a result, Germany and France, two countries with persistent trade surpluses with the United States, already from the late 1960s demanded the exchanging of their surplus US dollars either in their own currency (marks and francs, respectively) or even better in gold. The running down of US gold

and foreign-exchange reserves led the US government in 1971 to formally terminate the Bretton Woods agreements.

The concept of commodity money is present in the writings of the classical economists (Smith, Ricardo, J.S. Mill, Marx, *inter alia*). Their main idea is that the price of each commodity is determined by the ratio of the value of this commodity to the value of the money commodity/gold times the mint price of gold. This product multiplied by the quantity of commodities over the velocity of circulation gives the quantity of money necessary for circulation (Shaikh, 1980). Inflationary periods like that of the second half of the sixteenth century have to do with excess profits in gold production, which led to its more intensive production, discovery of new gold mines, the increase in the supply of gold and the lowering of its value leading to higher prices (see Foley, 1986, ch. 2).

ARIS PAPAGEORGIOU AND LEFTERIS TSOLFIDIS

See also:

Bretton Woods regime; Fiat money; Marx, Karl; Metallism.

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Consumer price indices

In principle, the consumer price index measures the price of goods consumed by a typical consumer in a given period of time, and changes in it measure consumer price inflation. Such indices are required for the comparison of standards of living at different times or in different places, and hence for the measurement of real economic growth. Changes in the index have since the 1980s also increasingly been a specific target of central banks. Frequently, they are also used to index-link benefits, allowances and the like (sometimes including wages), often with the objective of "depoliticizing" decisions about them. Stapleford (2009), however, analysed a variety of ways in which this objective is incompletely met. One significant source of debate in this regard arises from difficulties about measuring consumer prices, with the suggestion that the index tends to overstate inflation, promoting the idea that index-linking should be adjusted accordingly.

One difficulty arises simply from the problem of collecting information on actual prices. The index should be a weighted average of prices paid by consumers, with weights determined by expenditure shares. Expenditure surveys, however, are inevitably inaccurate. As there may be variations in the price of the same good in different areas, for different consumers, or even for different times of purchase, the problem is enormous.

A further difficulty arises from the problems of creating an accurate index when the weights change from period to period. Although such problems were well appreciated by Fisher (1922), most price indexes are calculated by the Laspeyres method: weights are determined by expenditures in an initial period, and the index calculated for a later period. To the extent that differential price increases of different goods lead consumers to substitute away from those goods that increase most in price, the typical consumer will be

better off with unchanged “real income” as measured by the consumer price index. This difficulty can be mitigated by more frequent rebasing, or by using more sophisticated measures of the kind surveyed by Diewert (1981), but at greater cost.

A further problem that raises both practical and conceptual issues concerns improvements in the quality of goods and the introduction of new goods. Wholly new goods obviously have no comparator in earlier periods. However, following Hicks (1940), one might assume that an earlier “price” of these goods was just high enough to make demand for them zero (when in fact the goods did not exist). If so, then the price at which these goods are actually sold must be lower than this earlier “price”, so that the introduction of the good amounts to a fall in the price index.

Changes in quality invite the response that a “quality-adjusted” price for each good might be estimated. It is usually supposed that the norm is for the quality to improve, and this was influentially emphasized by Stigler et al. (1961) and Boskin et al. (1998). Quality deterioration, however, is also possible, and Clague (1962) considered it seriously. In either case, measurement difficulties are apparent, and as services feature more and more prominently in consumer expenditures, the measurement of their quality becomes an important issue. The possibility of there being not only a trend, but also a cyclical aspect, with customer service perhaps deteriorating in boom periods, also becomes of increasing importance.

An important conceptual difficulty, however, arises from the problem of differentiating a “genuine” quality improvement from a change of taste (possibly induced by advertising). If expenditure shifts from a cheaper to a more expensive version of a good, there is no secure way to determine whether the second is “better” or simply fashionable. To treat being fashionable as a characteristic of quality leads to the question of whether the price index is intended to measure the cost of buying a specified basket of goods, or of achieving a specified level of utility. Opting for the latter would suggest, as Deaton (1998) observed, that increasing life expectancy, the spread of asceticism, or the spontaneous development of greater powers of enjoyment would then have a claim to being constitutive of a fall in prices. Similar and related points were made by Gilbert (1961). Another point, though, would be that if the price index is not meant to explain the income required to achieve a certain level of welfare, the idea that the Laspeyres index is flawed because consumers can protect their standard of living by changing their consumption pattern is also called into question. Consumers may be able to make advantageous substitutions, but that does not mean that this index overstates the increase in the price of goods they were consuming.

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See also:

Core inflation; Inflation; Inflation measurement; Inflation targeting.

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Contagion

Contagion in a broad sense has been studied as the propagation of an initial adverse macroeconomic shock from one market or economy to another. It has been characterized by robust comovements or excess positive cross-country correlations in macro-financial indicators (for instance, interest rates and sovereign spreads), beyond what can be explained by fundamental economic variables (see Bekaert et al., 2005). Most empirical literature still rests on the notion of “shift contagion”; that is, significant variations in pre-existing cross-market linkages (for example, correlations and speculative attacks) or changes in the transmission mechanism between two markets or economies in crisis periods (see Forbes and Rigobon, 2002).

The measurement of contagion is best echoed in the international portfolio theory (IPT). According to the IPT, taking a Chinese investor as an example, international portfolio investments in advanced foreign markets (therefore dissimilar or less integrated) like the United States are highly desirable, as these drive inter-country correlations between bonds and stocks even further down, thereby optimizing risk reduction and maximizing asset returns (Solnik and McLeavey, 2004). The intuition is that most adverse macroeconomic shocks are country-specific, such that financial markets in different economies display low correlations. The presence of contagion, therefore, apprehends this reasoning. Here, it is worth noting that Chinese and euro-area portfolio flows into US markets have been deemed a factor of the global crisis that erupted in 2008 (see Bernanke’s “global savings glut” hypothesis). In another sense, investors can hedge or diversify home-country risks through direct or capital investments in high-growth economies (for instance, US lending and portfolio flows to Mexico in the early 1990s that preceded the peso devaluation of 1994 and the subsequent “tequila” crisis).

One misconception of international diversification is entailed in the correlation breakdown theory (CBT). The CBT derives that, through higher market interaction (interdependence and/or contagion), correlations tend to “break down” exactly when they are needed most, such that the benefits of international diversification cannot manifest in crisis periods. Following this thought, the leading attempt to capture contagion has been to identify the “correlation breakdown”; that is, when the correlations of tranquil periods become unprecedentedly higher in periods of turmoil (as in crisis-contingent models). This is simply done by isolating the autocorrelation coefficients between several international markets (for instance, equity and bond markets) during

major global spillovers (see King and Wadhvani, 1990; Calvo and Reinhart, 1996; Baig and Goldfajn, 1998).

Some authors have conceptualized contagion as the spillover of volatility between markets or economies and have adopted generalized autoregressive conditional heteroscedasticity (GARCH) models in their empirical tests, while a third literature stream testing for cointegrating relationships employed longer time periods. Probit models later emerged to examine the contagious effects of exogenous events to an economy (see Forbes and Rigobon, 2002, for a review of empirical schools). The idea with factor models is to detect the autocorrelations in model residuals in line with the extreme-value theory (see Bekaert et al., 2012). Phylaktis and Xia (2009) add that some industries are more resilient than others, in the sense that they continue to emulate the merits of international diversification during contagious crises.

The first problem with the measurement of contagion is that almost all definitions and empirical studies have been prudent in specifying the channels through which contagion occurs. Further, if contagion measures a significant shift in pre-existing cross-market linkages, why do markets with very few linkages exhibit such a very high degree of comovement in the first place? South Korea, for example, was hit by the 1997 Asian crisis despite having very limited links with other Asian economies. Generally, theories to explain the channels in the transmission of shocks range from multiple equilibria, endogenous liquidity to other phenomena like the “wake-up call hypothesis”.

A second class of ambiguities is driven by issues with methodological aspects, and is exacerbated by the lack of a unanimous conceptual framework. The first problem in this regard is the endogeneity of asset prices. The second dispute is on how to properly account for heteroscedasticity: the correlation function used in empirical models is always increasing in the variance of the underlying asset return, implying that volatilities are naturally higher during crisis periods, making it difficult to attribute any robust comovements to contagion. After correcting for heteroscedasticity, Forbes and Rigobon (2002) found no evidence of contagion in the 1994 Mexican peso crisis, the 1987 US stock market crash, nor the 1997 East Asian crisis. They argued that higher correlations of crisis periods are simply a continuation of pre-existing real linkages and are not sufficiently significant to represent contagious effects.

Another complication is the omission of relevant variables: if any macroeconomic indicators that would exhibit strong autocorrelation are precluded from models, the statistical results become significantly biased. The application of different event windows and the subjective definition of idiosyncratic shocks create further divergence with results. A high level of econometric creativity can be observed in this regard. One reason is to circumvent problems with the limited frequency of the availability of macroeconomic data. Forbes and Rigobon (2002) criticized the relevance of previous studies, as authors have resort to historical periods, in order to avoid problems associated with public safety nets like the “lender of last resort”.

Finally, Beirne and Gieck (2012) note that the transmission of shocks depends on their origin. For instance, while US equity market shocks are identically transmitted to regional equity markets, a negative euro-area stock market shock would transcribe into favourable outcomes in regional markets. It is important to note that contagion, if considered to be independent of economic fundamentals, might become an obstacle to optimal policy. That is, if several crises cannot be explained by trade links, some economists and many

financial institutions in trouble would strongly argue that a no-bail-out strategy by policy institutions would allow for spillovers to other economic systems even if the latter were fundamentally delinked from the one in trouble.

SEBASTIAN WEYIH

See also:

Bank run; Financial crisis; Lender of last resort.

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Contested terrain

The question "Why do central banks do what they do?" seems like an obviously important question, especially considering that political straitjackets limit countercyclical fiscal policy, leaving central banks as the dominant macroeconomic policy-making institution in most countries. Yet, mainstream macroeconomics has given very little thought to analysing the economic and political sources of central bank goals and conduct.

Rather, the implicit assumption of most mainstream analysis is that central banks try to make policy in the general interests of society as a whole. From this perspective, "poor" monetary policy stems from failures of theory, judgment or forecasting rather than from a lack of concern for the public interest.

By contrast, the contested-terrain approach to the analysis of central banking – which borrows the term from Richard Edwards's (1979) book on the fight over corporate labour processes – suggests that central bank behaviour, like that of other important institutions of capitalist governance, can usefully be analysed as a struggle among key classes (and class-fractions) over economic policy (Epstein and Schor, 1990). Building on Kalecki (1943) and Boddy and Crotty (1975), Epstein and Schor developed a three class model in the spirit of Keynes (1936), arguing that in advanced capitalist countries, central bank policy is determined by a struggle between industrial capital, financial capital, and labour. This contest over policy, in turn, is shaped and constrained by key structural factors, including the relations between finance and industrial capital, the structure of labour markets, the position of the domestic economy in the world economy, and the dynamics and contradictions of capital accumulation itself. From this perspective, policy that fails to operate in the public interest can often be explained by

looking at the narrower interests – often financial interests – that dominate the central bank those policies are designed to serve. Since the configuration of these four factors may vary across countries and over time, central bank policy is likely to vary as well. For example, building on the work of Hall (1984), Epstein and Schor (1990) show that variations in the relationships between finance and industry in European (close) versus Anglo-Saxon (arm's-length) countries, together with different labour bargaining systems, can help explain differences in monetary policy among these countries. The institutional structure of the central bank itself is also crucial. Where central banks are “independent” of the executive branch of government, they tend to be dependent on the financial sector for political support, and therefore tend to make policy with “finance coloured” glasses (Epstein, 1981). This framework helped to explain, for example, the US Federal Reserve policy in the 1930s (Epstein and Ferguson, 1984), and in the Paul Volcker period (Epstein, 1982).

Epstein (1994) formalized these ideas, building and empirically estimating a highly stylized three class model based on a Marglin–Bhaduri framework. This model shows how differences in industry–finance relations (“enterprise finance” versus “speculative finance”), labour market relations (“Kaleckian” versus “neo-Marxian”) and the degree of central bank independence (“independent” versus “integrated”) could help explain monetary policy. He showed, for example, that independent central banks, which tend to be most influenced by inflation-averse financial sectors, in countries with weak ties between finance and industry (like the United Kingdom and the United States), and with more flexible labour markets tend to pursue tighter monetary policy.

Because of its emphasis on the role of class relations and structural factors in determining the political economy of central banking, the framework must be updated with changes in institutional and economic relationships. For example, in more recent work, Epstein (2002) argued that, in the 2000s, changes in the structures of industry–finance relations and labour markets led to a change in the orientation of monetary policy in many countries. Increased financial orientation of non-financial firms (that is, “financialization”), and increased importance of capital gains for both financial actors and financialized “industrial” firms prompted central banks in the United States, United Kingdom and elsewhere to lower interest rates to support asset price appreciation. Meanwhile, the reduced bargaining power of labour resulting from key changes in the global competition and domestic political institutions kept wage inflation in check. This change in political economy structures helps to explain the shift by the US Federal Reserve and other central banks to a low interest rate environment in the first decade of the twenty-first century.

The contested-terrain approach has been criticized for paying insufficient attention to the question of central bank control over monetary policy in a world of endogenous credit and financial innovation. Indeed, this framework could be enriched by more research work along these lines.

GERALD EPSTEIN

See also:

Asset price inflation; Central bank independence; Endogenous money; Financial innovation; Monetary policy objectives; Volcker experiment.

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Convertibility law

In March 1991, at the initiative of Domingo F. Cavallo (who was the Economy Minister of Argentina in the periods 1991–96 and 2001), the Argentine Congress passed a "Convertibility law" that established a Currency Board Arrangement (CBA). Contrary to the British colonial CBAs that existed from the nineteenth century to the end of the decolonization period, the most recent Argentine case was not aimed at encouraging a strong quasi-exclusive integration, but was conceived as an ultimate solution to hyperinflation and exchange-rate instability (Ponsot, 2003). According to the Argentine government, the parliamentary decision reinforced its "credibility" in a framework of economic chaos.

The so-called *Convertibility*, supported by the Convertibility law and the reform of the central bank charter in September 1992, had the following three main features: (i) full convertibility between the domestic currency and the US dollar at a fixed exchange rate; (ii) lack of an unlimited lender of last resort (LLR); and (iii) a bi-monetary system (partial dollarization).

At the beginning of *Convertibility*, the exchange rate was fixed at 10,000 *australes* per US dollar, but eight months later the *austral* was replaced by a new currency, the *peso*. The new parity was fixed at 1 *peso* per US dollar in order to create the monetary illusion that both currencies were virtually the same.

After uncontrolled devaluations and three episodes of hyperinflation between 1989 and 1990, *Convertibility* stabilized the exchange rate of the *peso* and, consequently, the price level. However, prior to the "Convertibility law" a monetary policy shock occurred: in January 1991, the Argentine government increased both the exchange rate and interest rates. After correcting the expected returns (in US dollars) on local assets, *Convertibility* was successful in attracting short-term capital flows to cover the current account deficit of Argentina.

The conventional wisdom that supported *Convertibility* pointed out that as the foreign trade disequilibrium was the result of fiscal imbalances, the solution was the implementation of a monetary rule. According to Cavallo (1996, p. 169), “a persistent fiscal deficit, increasingly financed by monetary emission, caused more and more frequent devaluations of the local currency”. However, the fiscal deficit was in fact a consequence and not a cause of the current account deficit, as also occurred ironically under the austerity of *Convertibility* (Vernengo and Bradbury, 2011). On the one hand, Argentina was one of those Latin American countries involved in the so-called “debt crisis” explained largely by the “Volcker shock”. Indeed, the impact of the sharp increase in the US federal funds rate of interest on developing countries was amplified by the large capital inflows recorded by them in the 1970s. Therefore, the rising interest payments on foreign debt increased public expenditures. On the other hand, in a framework of stagnant economic activity (revenues fall), persistent devaluations (increased interest payments measured in local currency) and high inflation (“Olivera–Tanzi effect”), the fiscal deficit increased explosively (Damill and Frenkel, 1990).

During *Convertibility*, initially, there was a rapid deceleration of inflation (1991–94), then the price level stabilized (1995–98), which was followed by a period of deflation (1999–2001). While exchange-rate stabilization resolved one of the most important cost factors that pushed inflation rates up, it is also true that distributive conflicts were not solved this time through repression by a military dictatorship but through a post-modern “market friendly” process. In a framework of fiscal austerity, trade liberalization and massive privatizations (as well as “foreignization”) of public utilities increased unemployment rates, thus reducing the bargaining power of workers and, consequently, real wages declined.

To some extent, *Convertibility* could be interpreted as a “heterodox” CBA, because the monetary authority never completely lost its ability to act as an LLR (Hanke and Schuler, 2002). While in a pure CBA the monetary base is fully backed by foreign reserves, *Convertibility* allowed that up to one-third of the backing could be composed of public bonds denominated in foreign currency and valued at market prices. Also, *Convertibility* set a contingent repo facility with a consortium of foreign banks that, later, was reinforced with the support of the World Bank.

However, as *Convertibility* flexibilities were not enough to match domestic liquidity demand with foreign reserves, the Argentine government faced an unsustainable foreign indebtedness to support the CBA. For that reason, even under this extreme case money creation was credit driven and demand determined (De Lucchi, 2013).

Finally, the increase in the degree of financial fragility was also caused by the dollarization of private portfolios, which was stimulated by *Convertibility*. Based on a “metal-list” approach, *Convertibility* indeed allowed an indiscriminate use of US dollars for both commercial and financial transactions between residents. As part of a bi-monetary system, banks were allowed to function under a fractional reserve system even for US dollar deposits.

In December 2001, after a foreign credit rationing, *Convertibility* collapsed. The financial system that had been the most highly liberalized in the world in its time (O’Connell, 2005) was disrupted by a balance-of-payment, fiscal, and banking crisis with dramatic social and political consequences. As a matter of fact, *Convertibility* took place in a framework of radical neoliberal reforms that reinforced its contractive and regressive

trends. In spite of the “carnal relations” with the United States, the US Federal Reserve never agreed, either in theory or in practice, to act as an international LLR. For that reason, contrary to the efficient-market hypothesis, the lesson of *Convertibility* is that in a monetary economy an unlimited LLR and financial regulation (that is, the State) are systemic needs.

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See also:

Currency board; Currency crisis; Dollarization; Efficient markets theory; Fractional reserve banking; Hyperinflation; Lender of last resort; Money and credit; Money illusion; Volcker experiment.

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Core inflation

There are several measures of inflation. The official measure – that is, the rate of change in the Consumer Price Index (CPI) in most countries – is also referred to as “headline inflation” owing to its ability to make news headlines. Headline inflation, however, is often subject to large and temporary fluctuations arising from supply shocks, for example production declines due to unfavourable weather conditions or external factors affecting the prices of one or more consumer goods imported into a country. Another measure of inflation aims at removing these volatile components from headline inflation. The concept of core inflation is based on the idea of identifying the underlying persistent trend of inflation.

There are multiple approaches to derive core inflation from headline inflation. Among them, the most widely used approach is excluding selected groups of items from the basket used to compute headline inflation and recalculating the weighted change of prices of the remaining items in the basket. Food and energy items and interest charges are the most popular exclusions. The exclusion method is used by central banks more frequently than other methods, as that method is computationally simple, easy to understand and derivable without any time lag.

In the United States, the Bureau of Labor Statistics has published the movements of an index excluding food and energy items from the CPI since 1977. This measure was

first systematically analysed by Gordon (1975). Since the movements in food and energy prices in the United States during the 1970s often reflected the developments outside of the country's domestic demand and supply factors, this measure of core inflation was useful to explain the inflation generated by domestic aggregate demand. Over the subsequent decade, economists tended to believe that food and energy price movements, being relatively volatile in the short to medium run, would make only transitory impacts on headline inflation. It was observed that large rises in these prices were often followed by large decreases in them, and vice versa. Volatilities in food and energy price movements, frequently caused by unusual weather conditions, were generally found to be self-correcting. In the countries located far from the equator, in particular, inclement weather conditions often lead to temporary food shortages and increases in demand for household fuels. In that framework, the core inflation measure compiled by excluding food and energy items served its intended purpose for several countries for a long period.

The rationale for excluding food and energy items is the volatility in their prices. However, analyses of the movements of prices by several researchers have revealed that only some (seasonal) components of food are more volatile (see Cutler, 2001). Many countries have excluded a part of the food basket, instead of the entire basket, together with energy items, for that very reason. Some of these countries exclude fresh food, unprocessed food or agricultural food without considering the statistical behaviour of price movements, while some other countries have picked the food items to be excluded based on the volatility measured using statistical properties of price movements. First-round effects of indirect taxes are another popular exclusion in several countries. If not excluded, the one-off impact of the tax change on inflation rates could obscure the long-run trend of the inflation time-series.

The most popular alternative approach to exclusion-based methodologies is the "trimmed mean" measure proposed by Bryan and Cecchetti (1994). The trimmed mean removes the items with extreme price changes; that is to say, the two ends of a histogram of price changes. The selection of upper and lower points, beyond which data are truncated, is a matter of judgment. As for its economic rationale, the trimmed mean has the potential to eliminate all relative price changes and thereby isolate the component of aggregate price change expected to persist (Clark, 2001). Among the other statistical measures used less often are the weighted median approach also proposed by Bryan and Cecchetti (1994), the volatility-weighted measure, and the exponentially smoothed measure (see Colgey, 2002). Despite the qualitative superiority of the statistical approaches over the exclusion method, central banks use them less commonly than the exclusion method, primarily because the statistical approaches are not easy to explain to the public and are difficult to replicate.

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See also:

Consumer price indices; Inflation; Inflation measurement; Inflation targeting.

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Corridor and floor systems

A corridor-type (with its floor-type variant) system is an approach to the setting of interest rates that an increasing number of central banks have adopted since the mid 1990s. The system has now become the operational framework that most central banks utilize for implementing their strategies on interest rates.

The interest rate policy of central banks consists of a strategy and an operational framework. Strategically, central banks set their desired level for one or more interest rates, based on what they consider adequate in terms of their public policy objectives. Operationally, they use a set of instruments and procedures to effectively steer the chosen interest rates toward the target policy rate. Since the 1990s, the prevailing operational framework for monetary policy implementation is a corridor system. In the 2000s, the central banks of Japan and New Zealand, as well as a number of other central banks in the aftermath of the global financial crisis, have further modified their framework and embraced a floor system.

Historically, the interest rate policy of central banks was simply the setting of the interest rate at which the central bank was willing to lend funds. This could be a discount rate – that is, the rate on discount window loans – or a Lombard rate, to wit, the rate on a collateralized loan of a standard maturity, usually overnight. This liquidity-providing standing facility would put a cap on banks' funding costs. When the interbank market for reserves began to develop, an increasing number of central banks began conducting monetary policy by choosing a target for the market-determined interest rate at which licensed institutions lend funds to each other on an overnight basis.

In order to target the interbank market rate, a central bank must engage in liquidity management to ensure that there is appropriate bank liquidity for the interbank market rate to be at target. First, it needs to estimate banks' demand for reserves; that is, the amount of overnight reserves necessary to meet reserve requirements (if any) and the amount banks are willing to hold as precautionary reserves. Second, it needs to estimate how the supply of reserves is influenced by "autonomous factors", including banks' net demand for cash and the government's net payments out of its account at the central bank (if any). Finally, the central bank uses open market operations to calibrate the amount of settlement balances in such a way that, given the demand for reserves, the interbank overnight market interest rate will settle close to the target, neither too high nor too low.

This market rate will fluctuate in response to factors affecting reserve supply and demand that are outside the central bank's direct control (Ennis and Keister, 2008). Small unanticipated changes in supply can lead to substantial interest-rate volatility above or below target if banks' demand for reserves is steep. Volatility is further amplified by

unanticipated shifts in the demand for reserves. Volatility is capped, however, by the interest rate set on the liquidity-providing standing facility. This rate sets an upper bound, or ceiling, for the market interest rate by giving banks the option to borrow funds outside the market, namely at the central bank. On the other hand, the lower bound, or floor, to the interbank market rate is the interest rate that a bank would receive by not lending its reserve balances on the interbank market. As this rate was traditionally set at zero, the lower bound was zero.

Since the 1990s, central banks have raised the lower bound by setting a positive remuneration on banks' excess reserves. This was typically implemented by creating a deposit standing facility at the central bank where banks earn interest on their overnight, or term, balances. This removes any incentive for banks to lend funds on the interbank market at a lower rate of interest and thus establishes a floor to the market rate. With the introduction of a floor above zero, central banks have the option of setting a symmetric channel, or corridor, directed at containing the volatility of market rates within symmetric bounds. This corridor system was particularly useful at a time when reserve requirements were on the wane worldwide, which made it more difficult to calibrate the supply of reserves. With the corridor system, the overnight interest rate on the interbank market can only oscillate within a channel, or band, between the lower and upper bounds set by the central bank. The narrower the corridor is, the lower the interest rate volatility, the higher the average recourse to standing facilities, and the smaller the interbank turnover (Bindseil and Jablecki, 2011).

In the 2000s, several central banks (either formally or *de facto*) have moved from a corridor system towards a floor system. While some central banks modified their framework for monetary policy implementation by setting their target rate of interest as the floor and providing banks with excess reserves, others responded to liquidity shocks by expanding excess reserves well beyond the target supply needed to achieve the target rate of interest. Unsurprisingly, the market interest rate fell to the floor of the corridor.

With the floor system, the market rate of interest is more stable, and the central bank can disentangle its interest-rate strategy from decisions concerning the scale of liquidity operations in response to liquidity shocks (Keister et al., 2008). The floor system has the advantage of simplifying liquidity management, making reserve requirements obsolete, and allowing the central bank to change its target rate of interest without necessarily changing the stock of reserves. The concern that, by downsizing the market for reserves, the floor system means losing market signals is hardly justified, considering that the price to be discovered is the price pre-set by the central bank by virtue of its monopoly on reserves.

ANDREA TERZI

See also:

Bank of Canada; Cash; Collateral; Effective lower bound; Interest rates setting; Monetary policy instruments; Monetary policy objectives; Open-market operations; Policy rates of interest; Reserve requirements; Settlement balances.

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Credibility and reputation

The issues of credibility and reputation of monetary authorities were introduced by the "New classical economists", in order to develop additional arguments in favour of monetary policy rules and against the use of discretionary policies. Their main goal was to show that an "inflation bias" emerges in cases where monetary policy is discretionary.

Monetary authorities are said to be credible if private agents believe in their commitment to price stability. Kydland and Prescott (1977) showed that it is in the best interests of central banks to announce a low-inflation policy and then, if private agents believe in the policy announced, to switch to a higher-inflation policy in order to temporarily reduce the rate of unemployment. As a matter of consequence, central banks will have a credibility issue, because rational agents will not believe them.

This credibility issue raised by Kydland and Prescott (1977) can only arise under very restrictive theoretical circumstances: central banks have to make their decision first before private agents can react, the game needs to be a one-shot one, and agents as well as the central bank must have full information and must not cooperate.

When the game is repeated and/or when information is asymmetric, central banks will need to take care of their reputation, an issue raised by Barro and Gordon (1983). Reputation can be broadly defined as the monetary authorities' credibility over the long run – whether or not agents will believe in their announcements when the game is repeated, on the basis of earlier actions. In the repeated game of Barro and Gordon (*ibid.*), reputation matters because a monetary authority exercising discretion can be "punished" by private agents in further stages of the game. As a matter of consequence, the monetary authorities must, in each period, weigh up the gains of cheating (which induces a lower unemployment rate) against the costs in terms of "inflation bias".

Another issue in Barro and Gordon (1983) is that agents do not know what kind of monetary authorities they are facing: a "hawk" (very sensitive to inflation) or a "dove" (more permissive to inflation). Over the various periods of the game, private agents will have to analyse the policy announcements and measures of the central bank in order to "extract" information about its true nature. Establishing a good reputation is for monetary authorities a way of avoiding this "signal extraction" issue (raised by Blackburn, 1992) and as a matter of consequence avoiding a possible inflation bias.

To sum up, in Barro and Gordon's (1983) repeated game-theoretic framework, reputation can be built by repetition or most preferably using monetary policy rules; the main benefit of a good reputation is credibility; and reputation can be damaged when monetary authorities cheat in order to (temporarily) reach a lower unemployment rate.

The economic framework used to deal with credibility and reputation issues can be heavily criticized. These issues can only arise in a "New classical" theoretical model, in which the long-run Phillips curve is vertical and expectations are formed in a forward-looking manner – and therefore monetary authorities can reduce the rate of unemployment below its natural rate only at the expense of an "inflation bias". However, there are

serious doubts about the existence of a natural rate of unemployment (see Stanley, 2005; Lang, 2009). There are also doubts about the idea that unions would bargain wages on the basis of expected inflation rather than recent inflation. The possibility for monetary authorities to create an “inflation surprise” has also raised serious debates, as it can take years for monetary policies to produce their effects.

As underlined by Forder (2001), the game-theoretic intuitions behind the “credibility and reputation” view have been imported from industrial economics. In rivalry between oligopolists, threats of fighting entry to market are cheap talk. But are private agents and monetary authorities in a similar relationship? Do monetary authorities really think it is in their best interest to fool private agents? Do private agents really act to punish the central bank?

At the end of the day, the need for a central bank to acquire a good reputation is strongly connected to the ideas that the main goal of monetary policy should be to minimize the “inflation bias”; that inflation is an evil *per se*; and that its main cause is wage increases. This whole set of ideas is highly debatable, especially when the central bank has other policy objectives (like reducing unemployment) or, in times of crises, when the main issue is the risk of deflation rather than inflation.

DANY LANG

See also:

Asymmetric information; Central bank credibility; Central bank independence; Inflation; Phillips curve; Rules versus discretion; Time inconsistency.

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Credit bubble

A credit bubble is a sustained and accelerating growth of bank loans relative to the growth of Gross Domestic Product (GDP), which finances a boom in both economic activity and in asset prices. The proposition that this growth of credit adds to demand – especially for financial assets – above and beyond that generated from existing incomes contradicts the “loanable funds” vision of lending in which loans are “pure redistributions” which “should have no significant macroeconomic effects” (Bernanke, 2000, p. 24), as lending simply redistributes spending power from lender to borrower without enhancing aggregate demand. However, in the endogenous-money view, lending enables demand to increase in the aggregate, thus financing a growth in economic activity and rising prices on asset markets. Prior to the global economic and financial crisis that

erupted in 2008, the dominant view in economics was that the proposition that “credit bubbles” had any macroeconomic significance was a figment of the imaginations of non-economists. The Modigliani–Miller theorem (Modigliani and Miller, 1958) – the relevant subset of the efficient markets hypothesis – argued for the irrelevance of credit to both the valuation of firms (except for the effect of the tax-deductibility of interest payments) and economic performance. The proposition that there could be a “financial accelerator” (Bernanke et al., 1996) gave conventional theory an argument as to how credit could impact on economic activity, but this mechanism relied on agency costs owing to asymmetric information and acted through the price of credit rather than its volume.

Since the outbreak of the economic and financial crisis in 2008, this “irrelevance view” has lost favour, and attention has turned to what the empirical record indicates is the effect of greater-than-mean increases in credit. Three authors, namely Jordà, Schularick and Taylor, have led the way here (see Schularick, 2009; Jordà et al., 2011a, 2011b; Schularick and Taylor, 2012), via the construction and analysis of a database of credit and economic cycles for 14 countries over a 139-year period (from 1870 to 2008). They provide an empirical definition of an “excess credit” variable (x) as “the rate of change of aggregate bank credit (domestic bank loans to the nonfinancial sector) relative to GDP, relative to its mean, from previous trough to peak” (Jordà et al., 2011b, p. 5), measured in percentage points per year. Clearly this can range from well below to well above zero (its average value over their sample of recessions was 0.47 per cent of GDP per annum).

Their database (www.aeaweb.org/aer/data/april2012/20091267_data.zip) includes 223 recessions, 173 of which they classify as “normal recessions” on the basis of the low value of their x indicator (the average value of x was 0.29), and 50 of which they classify as “financial recessions” (the average value was 0.71). Via a series of econometric tests they conclude that the value of x was the best indicator of the severity of the ensuing recession: the larger its value, the deeper the recession, and the longer its period. Since the value of x prior to a recession accurately indicates the severity of the recession itself, and the value of x invariably plunges during and in the aftermath of the recession, the rise and fall of x can be taken as a manifestation of the expansion and collapse of a credit bubble. The bubble clearly has impacts on both asset and commodity markets, causing a boom in both markets prior to the recession and a bust in both markets during the recession.

They note that their results are consistent with the Fisher (1933) debt deflation hypothesis and Minsky’s (1963, 1972) financial instability hypothesis, though their empirical research deliberately lacks a theoretical foundation, since a theoretically agnostic position allows them to simply document these “new important facts about the role of credit in the modern business cycle” (Jordà et al., 2011b, p. 38).

Though theoretically agnostic, the fact that “excess credit” (x) is a reliable indicator of both an approaching financial recession and its likely severity challenges the conventional view of the role of central banks (that financial crises cannot be predicted ahead of schedule) and that the proper role of central banks is to mop up after crises rather than attempt to prevent them from happening.

Support for the concept of credit bubbles also comes from the work of Biggs, Mayer and Pick (Biggs and Mayer, 2010; Biggs et al., 2010) on the “credit impulse” and Keen (2013, pp. 247–9) on the “credit accelerator”. Both terms refer to the change in debt divided by GDP, a measure that is consonant with Schularick’s x . These authors propose a causal link between debt acceleration and change in economic activity in both goods

and asset markets. This implies that economic booms and rising asset prices in part rely upon accelerating debt, and since continuous positive acceleration is impossible, a credit bubble will be defined by the transitions from positive to negative debt acceleration.

STEVE KEEN

See also:

Asset price inflation; Asymmetric information; Bubble; Debt deflation; Efficient markets theory; Endogenous money; Financial bubble; Financial crisis; Financial instability hypothesis; Money and credit; Minsky, Hyman Philip.

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Credit creation

The credit creation theory of banking is one of three theories concerning the role of banks in the economy. It maintains that each individual bank is able to provide credit and to issue money out of nothing, without having to have received new reserves first (as by contrast the fractional reserve theory of banking maintains), or without having to have received new deposits first (as the financial intermediation theory of banking maintains). Credit creation is recognized by, among others, Schumpeter (1912), Austrian school authors such as von Mises (1934 [1953]), post-Keynesian authors such as Moore (1988) and Rochon and Rossi (2003), and empirical economists such as Werner (1992, 1997, 2005).

The question about which of the three theories of banking is correct has been disputed for at least 150 years, without ever having been put to a decisive empirical test. This has recently been provided by Werner (2014a; 2014b), whose tests involved borrowing from a

bank that offered access to its internal processes and accounting. It was found that both the fractional reserve and the financial intermediation theories of banking are contradicted by the empirical facts.

The credit creation theory of banking was consistent with the observed operations and internal accounts. This empirical research established for the first time in the long history of banking that a bank that engages in what is usually called “bank lending” in actual fact purchases the signed loan contract (which it considers a promissory note), adding it to the assets side of its balance sheet, and simultaneously records its debt to the borrower in its accounts as a liability, but classifying it as a “customer deposit”, although nobody deposited this money: it was not transferred to the borrower’s account from anywhere inside or outside the bank. Instead, the bank created a fictitious customer deposit entry as a representation of its liability to the borrower to pay out the borrowed money. Since the public is not able to distinguish such fictitious customer deposits from real deposits, they are treated like the latter. Deposits at banks are money, constituting the vast majority of the “money supply”, as measured by M1, M2, M3 or M4.

Thus banks do not lend money. Instead, they purchase assets, and they owe the seller the payment. This debt by banks to the public is called a “deposit”, causing much confusion. It is therefore better to use the expression “credit creation” instead of misleading expressions such as “lending money”.

Through the process of credit creation about 97 per cent of the money supply is issued in the United Kingdom by commercial banks (Werner, 2005; Ryan-Collins et al., 2011). In other words, the money supply is privately created, although the central bank has the ability to influence such private money creation.

While banks create credit and money simultaneously through credit creation, credit is a superior measure of banks’ money creation activity compared to deposits. The latter measure money that is at the moment of measurement not used for transactions (that is, potential money, a measure of savings, which includes prior savings and newly created savings), while bank credit measures money creation that is being used for transactions.

Bank credit data also give an indication about the use money is put to, which has different macroeconomic implications, as the quantity theory of credit (Werner, 1997) indicates: bank credit creation for GDP transactions determines nominal GDP growth, while bank credit creation for transactions that are not part of GDP determine asset transaction values, and usually account for the bulk of asset price changes.

Bank credit creation is not directly influenced by central bank interest rates, because the credit market is characterized by pervasive rationing (as the equilibrium conditions of perfect information, complete markets, flexible prices and so on are not met). Rationed markets function according to the short-side principle, so that whichever quantity of supply or demand is smaller determines the outcome. Since the demand for monetary units is virtually unlimited, it is their supply that is the determining factor. In rationed markets the short side exerts allocation power, and is able to pick and choose who to trade with, often extracting additional non-price benefits.

Credit creation is in most countries undertaken by the banking sector, as governments have mostly given up creating and allocating the money supply. Banks are encouraged to maximize their short-term profits, without regulators insisting that they also create the right amount of credit and money, and without insisting that this newly created money

is used to fund transactions that are sustainable and beneficial to the community. As a result, much of the banking sector activity in countries such as the United Kingdom is unsustainable and not beneficial for society.

Many central banks have therefore in the past decided to intervene in the bank credit market in order to guide bank credit – both its quantity and its allocation for particular types of economic activity. Such credit guidance was pioneered by the German central bank (Reichsbank), but has at times been adopted by most central banks. Most notably, it has been deployed by the successful East Asian economic developers (Japan, Korea, Taiwan, and China) in the post-war era. Through this policy, harmful, unsustainable or undesirable transactions were not forbidden, but could not receive newly created credit money to fund them (for instance, bank credit for financial speculation was not allowed during the heyday of credit guidance). Instead, bank credit was guided towards investment in the production of goods and services or implementation of new technologies, which contributes to nominal GDP and, since productive, does not drive up consumer prices, thus also boosting real GDP.

An alternative to credit guidance is to end the conflict of interest inherent in for-profit banks operated for the benefit of shareholders by shaping the structure of the banking sector so that it is dominated by small, local, not-for-profit banks operating for the benefit of the community. This has been the case in post-war Germany.

A policy of credit easing has been suggested in the aftermath of banking crises in order to ease the pressure on the banking system and produce an economic recovery through an expansion in credit creation.

RICHARD A. WERNER

See also:

Credit easing; Credit guidance; Money and credit; Money creation; Money creation and economic growth; Quantity theory of credit; Reichsbank.

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Credit divisor

When the monetary base is endogenous, the direction of causality between that variable and loans or deposits is reversed. Hence, the orthodox concept of the money multiplier (see Phillips, 1920; Cannan, 1921; Crick, 1927) is replaced in most heterodox theories with the credit divisor, a concept developed by Le Bourva (1962 [1992]), a prominent French monetary theorist. As pointed out by Lavoie (1992b), who translated Le Bourva's original 1962 paper into English, the specific phrase *diviseur de credit*, or "credit divisor", first surfaced in a later article by Lévy-Garboua and Lévy-Garboua (1972, p.259). Nonetheless, these authors attribute their turn of phrase to a suggestion by Le Bourva (1962 [1992], p.259) himself.

Le Bourva wrote mostly about "overdraft economies", to wit, systems typified by companies that were always in debt to banks, and banks that were perpetually in debt to the central bank. In such economies, banks supply credit to creditworthy customers on demand at a fixed rate of interest, up to given credit limits. Lavoie (1992a, pp.174 and 207–10), Renversez (1996) and others have further generalized the divisor concept to a more "financialized" economy.

Following Renversez (1996, p.477), one version of the credit divisor relationship is:

$$M \equiv d \times L \equiv \left(\frac{(1-g)}{1-(e+f)} \right) L$$

where d is the credit divisor, L is bank loans, M is a narrow monetary aggregate (banknotes and demand deposits held by the public), e is the ratio of "vault cash" to retail bank deposits, f is the ratio of (required) reserve balances to deposits, and g is the household sector's ratio of banknotes to deposits (see also, *inter alia*, Goodhart, 1995). In general, the above equation can be read as an identity. If the parameters e , f and g are assumed constant, it can also be read as the reduced form of a simple model. Then, defying the "base money multiplier" approach, the equation above is read from right to left, making credit the endogenous variable. Even in more complicated models in which the relevant coefficients are functions of rates of return, liquidity preference and so on, this divisor approach comports well with the adages according to which "loans make deposits" and "deposits make reserves". The crux of the matter is the endogeneity of the monetary base.

Renversez (1996) describes the model-based interpretation of the above equation with constant parameters as the "strong form" of the divisor theory. The behavioural parameters e , f and g of course change over time, implying that the divisor itself changes, but the French overdraft economists believed that they were approximately constant in a system such as theirs over an appropriate run. Moore (2006, p.204) claims that, in practice, "there is considerable week-to-week variation in the money multiplier (m) over the short run. But for periods of one quarter or one year (m) is empirically highly stable". Some Institutionalists, Minskyans and post-Keynesians emphasize that the equation above is merely an identity, insisting on a strong proviso that the relationship between bank lending and the monetary base varies over time with financial innovations and changes in institutions (see Niggle, 1991; Palley, 1996).

Hence, Renversez's (1996) "weak form" of the divisor, which is most relevant to an

asset-based system, allows for asset demands that depend on interest rates and other variables. In general, the analysis embodied in the credit divisor remains relevant in an asset-based system, in part because open-market operations provide short-term paper on demand at a policy-determined rate of interest. Indeed, central bankers (see for instance Constâncio, 2011) have occasionally gone on record in favour of the “divisor” interpretation. While the originators of the “divisor” looked to credit controls as the primary means of preventing excessive credit growth, modern-day policy regimes in central banking often place reliance on interest-rate rules.

Despite the reservations insisted upon by sceptics, Le Bourva’s analysis is still applicable in some form to all modern monetary systems. As Moore (2006, p. 208) categorically states,

[i]n the real world, CBs [central banks] do not exogenously increase or decrease the supply of credit money by expanding or contracting the high-powered base as the money-multiplier analysis asserts. CBs continually smooth security prices to ensure system liquidity at their targeted level of interest rates. The CB sets BR [bank rate] and the supply of credit money varies endogenously with changes in the demand for bank credit.

Recent history has illustrated that, for example, “quantitative easing” and other “unconventional” policy measures change the composition of private sector balance sheets, but nonetheless any undesired balances thereby created return to the banking system, as dictated by the so-called “law of reflux”.

GREG HANNNGSEN

See also:

Endogenous money; High-powered money; Interest rate rules – post-Keynesian; Money multiplier; Open-market operations; Quantitative easing; Reflux mechanism.

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Credit easing

The expression “credit easing” was first used prominently by the chairman of the Board of Governors of the US Federal Reserve System (Bernanke, 2009). In his speech at the London School of Economics, Bernanke (ibid.) subtly criticized the Japanese central bank and its attempts at monetary stimulation, arguing that the Japanese policies were not the best way to help the economy after a banking crisis, and that he had been implementing a different policy, which also aimed at expanding the quantity of money available, but was targeting credit availability more directly.

The expression “credit easing” derives indeed from the expression “quantitative easing”, which itself originates in Japan. The Bank of Japan (BoJ) was the first central bank to adopt a policy by that name, describing its actions between 2001 and 2006 (labelling these as “quantitative easing” retrospectively since about 2003; see Lyonnet and Werner, 2012).

As these policies consisted largely of increasing banks’ reserves at the central bank – that is, standard monetarist narrow money expansion (“reserve expansion”, “high-powered money expansion”) – it was surprising that the BoJ chose to use this relatively new label for such a well-established policy, known under other names. The reason for this must lie in the older genesis of the expression “quantitative easing”, which had originally been used to describe a policy of expanding credit creation for GDP transactions, in accordance with the quantity theory of credit (Werner, 1995). This policy is designed for the aftermath of banking crises, and presupposes an understanding of the causes of the crisis: they are produced by excessive credit creation for transactions that do not contribute to GDP, namely financial and asset transactions, including property and real estate.

Werner (1994, 1995) had argued that the traditional monetary policy of lowering interest rates was not likely to work in a post-asset bubble banking crisis cum recession, when banks are burdened with bad debts and hence reducing credit creation. He argued that interest rates follow nominal GDP and thus cannot be used to stimulate it. Instead, policies needed to be adopted in order to expand bank credit creation for GDP transactions, as this would boost nominal GDP growth. As Werner (1995, 1996, 1998) argued, these policies are:

- (1) Central bank purchases of non-performing assets from banks at face value (or at least significantly above any imputed market value), while not marking them to market.
- (2) Central bank purchases of assets from the non-bank private sector in order to support those asset markets and stimulate purchasing power in the economy.
- (3) A switch of the method to fund the public sector borrowing requirement from bond issuance to entering into loan contracts with the domestic bank (on a pro-rata basis), thereby increasing bank credit creation for GDP transaction directly (and often, as would have been the case in the euro area, doing so at lower interest rates,

- as the interest rate in the market for bank credit can be significantly lower than bond market yields).
- (4) Selectively relieving or suspending Basel capital adequacy rules in order to encourage banks to increase lending for small and medium-sized enterprises and the real economy.
 - (5) Introducing a regime of credit guidance to ensure an expansion in productive bank credit, while suppressing harmful and unsustainable speculative credit.

Werner (1995, 1996, 1998) also argued that expanding high-powered money (bank reserves) was not likely to stimulate the economy. The BoJ agreed with the latter assessment of reserve expansion policy in a number of publications until and including February 2001, only one month before it adopted such a policy of increasing bank reserves. As BoJ staff Fujiki et al. (2001, p.99) noted in February 2001, “providing additional monetary base by orthodox operations [. . .] does not affect [. . .] interest rates or amount of lending. In other words, providing monetary base [. . .] is not an effective monetary easing measure”. Why the BoJ thus chose to restrict itself to such a policy, which it agreed with Werner would not work – and to use the expression “quantitative easing” to describe it, although it was already known as standard “reserve expansion” – is puzzling. It possibly could have been an attempt to discredit the original “quantitative easing” proposal – although that would be a macabre use of monetary policy, at the cost of large-scale unemployment.

Under Bernanke, the US Federal Reserve in September and October 2008 adopted key tenets of the original “quantitative easing” proposals by Werner (1995, 1996), notably large-scale asset purchases from banks. In order to differentiate his policies from the failed policies of reserve expansion adopted by the BoJ (even though confusingly called “quantitative easing”), Bernanke chose to use a modified expression, which emphasizes the core principle of Werner’s proposals, namely to expand credit creation. Bernanke thus coined the term “credit easing”. Ironically, he thereby returned to the original meaning of “quantitative easing” (Werner, 1995), which was defined as an expansion in credit creation (“credit easing”), focusing on the assets side, not liabilities (reserves). This may not be by coincidence: Bernanke was an active participant in the debates on Japanese monetary policy in the 1990s.

Meanwhile, the Bank of England also adopted a policy it called “quantitative easing” in March 2009. It varied from the BoJ’s version, and was more in line with Werner’s definition in another respect: it conducted asset purchases through a subsidiary (so they would not have to be marked to market) that purchased them from the non-bank private sector. However, the Bank of England failed to buy nonperforming assets from banks, therefore forcing the government to step in and purchase bank equity and bank assets – a far costlier method, resulting in an expansion of government debt and consequent fiscal retrenchment.

Reflecting criticism of its policies (see Lyonnet and Werner, 2012), the Bank of England announced a policy called the “funding for lending scheme” in 2012, which for the first time targeted “lending to the ‘real economy’” (Churm et al., 2012, p. 309), to wit, the variable emphasized by the quantity theory of credit. Further, the Bank of England adopted first steps towards credit guidance in its monetary policy measures announced on 26 June 2014 (Bank of England, 2014), in line with Werner’s recommendations.

Likewise, the European Central Bank, having been briefed on the necessary post-crisis credit expansion policies (see Werner, 2011), finally adopted measures towards such policies on 5 June 2014, by incentivizing banks to increase “lending for the real economy”, defined as “lending to the euro area non-financial private sector, excluding loans to households for house purchase” (European Central Bank, 2014). As there is no other monetary or macroeconomic theory that disaggregates credit for the real economy (GDP transactions) and credit for non-GDP transactions, it can be said that the quantity theory of credit has gained wider acceptance in the post-crisis years in the United States and in Europe.

RICHARD A. WERNER

See also:

Basel Agreements; Bernanke, Ben Shalom; Credit creation; Credit guidance; Quantitative easing; Quantity theory of credit.

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Credit guidance

Pioneered by the Reichsbank in 1912, credit guidance is a technique used at one stage by most central banks to manipulate bank credit creation in order to achieve monetary policy and sometimes industrial policy outcomes. This technique was transferred from Europe to Asia by Hisato Ichimada, who trained with Reichsbank president Hjalmar Schacht in the 1920s in Berlin, before later becoming the governor of the Bank of Japan, which used that instrument continuously from 1942 until at least 1991 (Werner, 2002, 2003a).

The common name for “credit guidance” in East Asia is “window guidance”. In this procedure, the central bank determines quarterly loan growth quotas for all banks in a top-down process starting with the desired nominal GDP growth, followed by the corresponding growth in bank credit for GDP transactions (in accordance with the quantity theory of credit), which is then awarded *pro rata* to individual banks according to their assets size. Progress with the implementation of the loan quota is reported by the banks to the central bank on a monthly basis. During the monthly hearings, all information on bank balance sheets, in particular their assets side, is disclosed.

The central bank frequently uses these procedures to enforce qualitative credit guidance, which can take the form of positive or negative credit guidance, or a combination thereof. In negative credit guidance, which is more frequent, banks are told by the central bank which industrial sectors and/or transactions should not receive credit from the banks. Frequently, unproductive credit creation is restricted; that is, bank loan extension for transactions that either do not contribute to GDP (credit for financial transactions, tending to result in asset price inflation and banking sector instability) or do not result in the production of goods and services or the implementation of new technologies (consumption credit, tending to result in consumer price inflation). This usage of credit guidance is in accordance with the quantity theory of credit.

Werner (2003b) contends that bank-centred financial systems were designed to enhance credit guidance. Banks were not supposed to undershoot or overshoot the credit quota. Compliance was ensured by punitive loan quotas in the following period or other measures costly to banks. Note that such compliance can be enforced by central banks, as banks are sooner or later virtually dependent on the cooperation of the central bank in the interbank market, and hence eager to maintain a close relationship.

The Japanese “window guidance” system was introduced in Korea and Taiwan when these were still part of Japan (until 1945), but maintained virtually unchanged in the post-war era. China introduced credit guidance as part of the reforms spearheaded by Deng Xiao Ping in the late 1970s and early 1980s, following his visits to Japan. Other countries using this tool at one stage include Thailand, Malaysia, and India. In Europe, credit guidance has been used by the central banks of the United Kingdom, France, Germany, Austria, Sweden, and Greece, among others. The US Federal Reserve used the tool sporadically, including in the 1920s. In post-war Germany credit guidance was not used, as the same outcome of ensuring productive use of credit could be achieved through a banking sector structure dominated by small, local, not-for-profit banks extending investment credit to small and medium-sized enterprises. During the early 1970s, a secret meeting at the Bank for International Settlements compared central bank experience concerning credit guidance, and recommended that central banks at least in public de-emphasize this tool, as it was not considered in accordance with the official theory of free markets (Werner, 2003a).

The degree of success of credit guidance is disputed. Some authors assert that the tool could not possibly be successful, as only banks are controlled by it, thus resulting in regulatory arbitrage as non-banks evade the procedure. However, this argument assumes that banks are merely financial intermediaries. In fact, banks are special, as they issue money through their extension of bank credit. That is precisely why it is sensible for central banks to monitor and guide bank credit. Non-bank financial intermediaries or capital markets for that matter do not need to be monitored in this way, as they can only

re-allocate existing purchasing power. That, however, is a private sector activity whose regulation is difficult to justify. Not so for bank credit creation, which exploits the public privilege of issuing money for new transactions. As a result, a conflict of interest exists in the case of for-profit banks maximizing their shareholders' value: their activities may be harmful for society or at least not "socially useful". In this case, regulation, such as in the form of credit guidance, is justified.

Sometimes the examples of Japan during the 1980s and Thailand during the 1990s are cited as evidence that credit guidance policies are not effective. However, Werner (2002, 2003a, 2005) has shown that in both cases the credit guidance mechanism worked very effectively. The problem was that the central banks of these countries chose to set very high loan growth quotas and encouraged banks to provide unsustainable financial credit for speculative purposes. What is often neglected in this context is that credit guidance is not confined to periods when the central bank wishes to restrict bank credit. It can be and has been used as an effective tool to increase bank credit. This is possible, because the credit market is rationed and supply-determined, allowing banks to increase credit supply at any time (although at varying levels of risk, which is endogenous to the type and quantity of credit supplied). Therefore credit guidance can also be a useful tool to reduce unemployment during severe economic slumps, such as that in Spain or Greece since the euro-area crisis. It can be a part of a policy package to engage in credit easing.

RICHARD A. WERNER

See also:

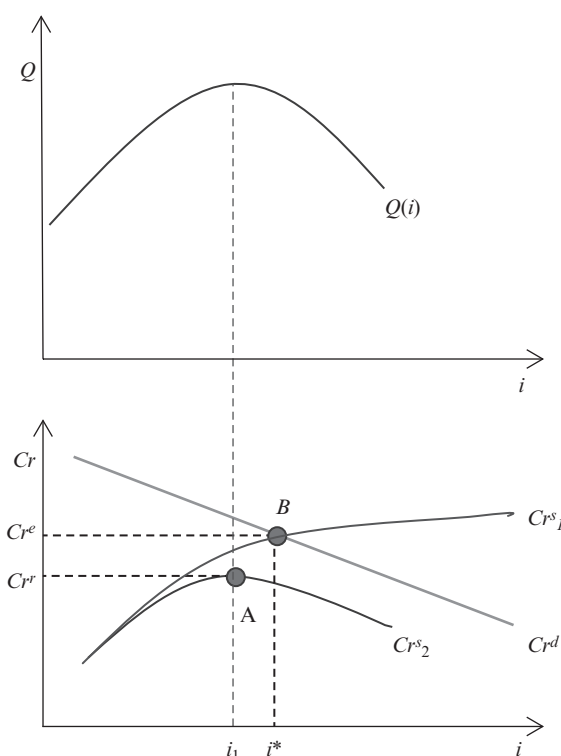
Credit creation; Credit easing; Quantity theory of credit; Reichsbank; Schacht, Hjalmar Horace Greeley.

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Credit rationing

The efficiency of financial markets has long been disputed. One of the earliest and most thoroughly analysed cases of inefficiency of these markets is a phenomenon called "credit rationing": lenders (typically commercial banks) refrain from supplying credit to borrowers (typically investing companies or dissaving, consuming households) despite the fact that these borrowers are willing to pay a higher interest rate. Therefore, credit rationing refers to a situation of "market failure", as the market equilibrating mechanism of price adjustment is not working. If such behaviour becomes paramount, "Keynesian" properties of lasting unemployment and persistent output gaps become plausible at the macroeconomic level. Hence, credit rationing is part of the toolbox of Neo-Keynesianism (see for instance Greenwald and Stiglitz, 1993).



Source: Author's elaboration.

Figure 2 Credit rationing

Commonly, Stiglitz and Weiss (1981) are referred to as the pioneers of “credit rationing”. Although they certainly authored the seminal paper with regard to the microeconomic foundations of credit rationing behaviour of rationally acting banks, there had been an extensive literature on the phenomenon as early as the 1960s (see for instance Hodgman, 1960; Freimer and Gordon, 1965; Jaffee and Modigliani, 1969). The theory of credit rationing can be illustrated as follows (see Figure 2). We assume ordinary credit demand (Cr^d) and credit supply (Cr^s) curves. *Ceteris paribus*, borrowers demand more credit with a falling interest rate (i) and lenders offer more credit with a rising interest rate. Additionally, we assume that credit default risk is increasing with rising interest rates as the portfolio will be pushed towards riskier borrowers (adverse selection effect) and borrowers may get an incentive to engage in riskier projects (moral hazard effect).

Rational bankers will increase credit supply until interest earnings will be overcompensated by the (expected) cost of credit default: bank's profits (Q) will be at maximum at point A. As the credit supply curve with increasing default risk Cr^s_2 is lower than the (notional) credit supply curve with constant default risk Cr^s_1 , equilibrium interest rate i^* and equilibrium loan size Cr^e are higher than interest rate i_1 and Cr^r turn out in a

situation of credit rationing. This is commonly also called an “equilibrium outcome”, as it reflects rational behaviour. However, both the adverse selection and the moral hazard effects only occur when one side of the credit market (the borrowers) has more and better information than the other side (the lenders); that is, on the assumption of imperfect, asymmetric information.

Credit rationing has come under theoretical and empirical critique. As it is based on increasing credit default costs owing to adverse selection and moral hazard effects under asymmetric information, arrangements to neutralize credit default costs, such as collaterals, or to mitigate asymmetric information problems by the use of self-selection mechanisms, such as different types of loan contracts, have been put forward to re-establish the market clearing solution of unconstrained loan markets even under imperfect information (see for instance Wette, 1983; Bester, 1985). Empirically, it has been shown that interest-rate stickiness, which is a common feature of credit markets, is a necessary but non-sufficient condition for the proof of credit rationing. Berger and Udell (1992) point out that much of existing interest-rate stickiness is better attributed to implicit interest-rate insurance arrangements than to credit rationing, which they argue to be a rather insignificant macroeconomic phenomenon.

Finally, in the heterodox literature, a post-Keynesian version of the theory of credit rationing has been put forward (see Wolfson, 1996), which does not rest on asymmetric information as its Neo-Keynesian counterpart but on asymmetric expectations. Assuming fundamental uncertainty and the non-existence of objective or subjective probability functions – that is, non-ergodicity as one of the crucial axioms of post-Keynesianism – credit rationing behaviour of banks (and other financial intermediaries) can easily be made plausible once we allow for a different evaluation of the economically relevant future, to wit, if we assume that lenders and borrowers systematically differ in their expectations in a way that borrowers are typically more confident in the economic future of their project than a potential lender. Note that this outcome is independent of the distribution of available information and the risk preference of borrowers and lenders. It has been shown that credit rationing based on expectations and states of confidence can easily be integrated into a Minsky-type process of financial instability (see Alves et al., 2008, pp. 413ff) and, thus, gain macroeconomic significance particularly for the business cycle.

ARNE HEISE

See also:

Asymmetric information; Collateral; Efficient markets theory; Financial instability; Output gap.

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Cross-border retail banking

Cross-border retail banking – direct lending to and depositing from non-bank customers – had increased rapidly before the global financial crisis. Cross-border claims to foreign non-bank customers dominated the cross-border banking activities of banks with a share of about 41 per cent by mid 2012, thus even exceeding the share of claims that these banks had with related banks abroad (about 30 per cent). Likewise, the share of liabilities to the private non-bank sector abroad (about 43 per cent) exceeded the liabilities to all other foreign sectors. This dominant role emerged towards the end of the twentieth century. Direct cross-border loans and deposits to non-banks as a major part of all cross-border claims and liabilities with non-banks alone accounted for a market share of about one-third (see Sander and Kleimeier, 2013).

Despite the above-documented globalization, it would be premature to declare the "death of distance" in cross-border retail banking (see Degryse and Ongena, 2005). This is especially true for cross-border loans, which suffer from information asymmetry and monitoring problems that are likely to be intensified in a global context where borders matter and differences in regulation are substantial. In this sense, Sander et al. (2013) provide evidence that "deep" regional integration agreements such as the European Union, which homogenizes regulation, promote cross-border lending while other, less deep regional integration schemes do not. As cross-border deposits suffer less from asymmetric information, the major drivers are substantial interest rate differences and regulatory arbitrage, as customers want to take advantage of differences in deposit insurance systems, taxation and reporting to the home country tax authorities (see, for instance, Huizinga and Nicodème, 2004, 2006). But differences in financial market efficiency also play an important role (see for example Alworth and Andresen, 1992), while regional free trade agreements as well as common currency arrangements can facilitate and support such cross-border depositing activities (Sander et al., 2013).

Cross-border retail banking offers a number of benefits to banks and their customers. Next to international diversification benefits for both, it can insure bank customers against financial crises at home, be it by depositing abroad or via access to foreign bank loans in times of a domestic credit crunch. Banks can insure themselves with cross-border lending and cross-border funding against crises originating in the domestic real sector. But these benefits come with the cost of a potential vulnerability to foreign shocks. While bank customers are especially vulnerable to foreign financial crises, banks face risks emanating from crises in the foreign real sector. In case of substantial foreign exposures this increases the risk for crisis contagion across countries. Moreover, borrowers in cus-

toomer countries expose themselves to currency risks when borrowing in foreign currency abroad, the so-called “original sin” problem. As domestic financial crises and currency crises often occur as twin crises, the insurance benefits from borrowing abroad can easily be (over-) compensated by foreign-exchange losses that increase the debt burden measured in local currency.

Financial crises in bank countries can lead to a reduction in direct cross-border lending (see for instance Cetorelli and Goldberg, 2010; Ivashina and Scharfstein, 2010). On the other hand, one would expect that (frequent) financial crises in customer countries would stimulate more foreign borrowing to insure against such crises. However, Kleimeier et al. (2013) find evidence for such a response only for currency crises and not for banking crises, except for the 2008–09 global financial crisis. In contrast, depositors are found to respond to domestic financial crises by internationalizing their deposit holding. In this sense, previous financial crises have been a driver of retail banking globalization. If, however, financial crises occur in both the bank country and the customer country at the same time, such as in a global financial crisis, the benefits of cross-border banking can evaporate quickly, leaving banks and depositors with only the costs and no safe havens.

Cross-border retail banking is only one way in which banks can reach foreign customers. It is part of what has been called the “international model of global banking” as opposed to the “multinational model of global banking”, where banks reach customers indirectly through foreign subsidiaries and branches, which some observers evaluate more positively in terms of global financial stability (see McCauley et al., 2010). It should be kept in mind, however, that the “international model” includes the global wholesale funding of banks, which was a crucial factor leading to the global financial crisis (see Shin, 2012), while the “multinational model” can also expose customers to severe external risks (De Haas and Van Horen, 2013). Nevertheless, the fact that cross-border retail banking has even increased its share in global banking during and since the global financial crisis indicates that it is still attractive and requires the close attention of researchers and policy makers alike.

HARALD SANDER

See also:

Asymmetric information; Contagion; Currency crisis; Financial crisis.

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Currency board

A currency board arrangement (CBA) is a domestic monetary regime governed by three strict rules:

- (1) an exchange rate rigidly pegged to a foreign currency;
- (2) the obligation for the currency issued to be freely and integrally convertible into this foreign "reserve currency"; and
- (3) an obligation for the currency board to keep in its balance sheet a volume of foreign reserve currency equal to at least 100 per cent of the monetary base (that is, currency in circulation plus bank reserves).

The first generation of CBAs was the monetary core of the sterling system that reached its peak in the sterling area period. It was the major instrument of monetary integration of the most dependent British imperial territories to the motherland. By issuing its own currency against a full backing of sterling assets, a colony enjoyed the benefits of a sound local currency without the drawbacks and costs associated with using the actual sterling notes in distant lands: sterling note denominations were too large to be practical; costs related to shipping and risk of destruction or loss were high; and, furthermore, colonial authorities could capture "seigniorage revenues", that is, obtain resources from yields on reserve assets instead of letting them to the Bank of England.

The most decisive stage was the report of the Emmot Committee (1911–12) on currency matters in some African colonies, which led to the building-up of the West African Currency Board (1913). The latter served as the actual prototype of the British imperial CBAs. This generalization of CBAs coincided with the end of Britain's predominance as the first international power and the beginning of its regional retreat on its own Empire. Between the Great War and the Great Depression, the United Kingdom tightened up its connections with sterling-associated countries and started to reinforce integration with territories under its dependency.

A kind of international division of labour was set up within the British Empire. Most colonial trade finance was obtained through British "overseas" banks. Local operating branches of British banks had the protection of colonial military power; they benefited from maximum financial safety provided by the security of the currency board and the unrestricted connection with London head offices. A local lender of last resort had therefore little relevance. Indeed, the Bank of England acted as the lender of last resort for the entire Empire. British authorities established CBAs to reinforce colonial integration and

monetary cohesion of its Empire. An unforeseen CBA scheme – surprisingly designed by John Maynard Keynes himself, then a senior official at the British Treasury – was also set up in 1918 in North Russia during the Russian civil war (Ponsot, 2002).

Today, Hong Kong, Djibouti, Brunei, and a few small territories (Gibraltar, the Falkland Islands, the Cayman Islands, Bermuda, Antigua and Barbuda, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, and Saint Vincent and the Grenadines) still operate under a CBA (Ghosh et al., 2000). A most significant fact was the emergence of a second generation of CBAs in the 1990s: Argentina (1991), Estonia (1992), Lithuania (1994), Bulgaria, and Bosnia and Herzegovina (1997). Argentina abandoned its CBA in January 2002 after a severe financial and economic crisis. With Estonia's adoption of the euro in 2011, its CBA was upheld.

Contrary to the British colonial era, the second generation of CBAs has been created to fit other purposes than a strong quasi-exclusive integration with the country that issues the anchor currency. Rather, they have been conceived as an ultimate solution to end monetary and financial chaos in “emerging” economies (hyperinflation, transition process financial crises, post-war reconstruction). They have not been motivated by a desire to reinforce integration with a strong economy, but in order to boost monetary stability, economic openness and financial liberalization. They were solutions to bring about the sacrosanct credibility required by greater openness to globalized markets. In that sense, CBAs have been the instrument of the economic policies prescribed by the “Washington Consensus” during the 1990s.

The CBA's most consistent supporters were among economists of the New Classical School. Barro (1998) has recommended it in the case of Latin America and Russia. He thus remained faithful to the conceptions of the theory of rational expectations. Since any discretionary policy is doomed to failure and contain an inflationary bias, such policies must be cancelled or replaced by strict unchanging rules in order to guard against all sources of instability and inflation.

The arguments against CBAs range from the claim that such monetary arrangements imply giving up the central bank's role as lender of last resort (LLR), to the claims that they involve a deflationary growth dynamic, and that they slow down adjustments to external shocks. In absence of a domestic LLR, the banking system of countries under CBAs might be extremely vulnerable (Ponsot, 2003).

To assure financial stability of their banking system, CBA countries need strengthened direct or indirect connection with the financial system of the country that issues the reference currency to balance the absence of a domestic LLR. The inelasticity of central bank money supply may have some impact on the credit supply dynamics, and thereby on economic activity. In the case where the central bank refuses all accommodation, interest rates violently increase. If the country's economy is not able to record a current account surplus, then there is a persistent stagnation or restriction of credit. To assure a favourable growth dynamic, CBA countries need a high degree of trade and investment links with the issuer of the reserve currency.

CBAs, like dollarization regimes (see Studart, 2001), are asymmetric monetary unions. Permanent CBAs are not viable without strong monetary and financial integration. So, if a country opts for a currency board, it should peg to a currency of a country that accounts for the lion's share of its own external trade. More broadly, CBAs make sense only for small economies with sufficient commercial, financial and eventually

political links with the core economy. That is what happened under the first generation of CBAs.

JEAN-FRANÇOIS PONSOT

See also:

Convertibility law; Dollarization; Hyperinflation; Lender of last resort.

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Currency crisis

A currency crisis is a form of financial crisis marked by the abrupt devaluation of a nation's currency ending a period of fixed or pegged exchange rates. A sudden shift in international asset portfolios, with its rapid reversal of capital flows, is the proximate cause of a severe collapse in the external value of a nation's monetary unit. And most would agree that all such events are characterized by "investors fleeing a currency en masse out of fear that it might be devalued, in turn fueling the very devaluation they anticipated" (Krugman, 2007, p. 1). While investor action driven by a fear of a crisis drives the actual crisis, the dramatic change in the external value of a nation's currency defining the actual crisis implicates a nation's macroeconomic accounts, particularly its fiscal deficit, sovereign debt, and balance of payments.

Theories about currency crises differ fundamentally in their assignment of an underlying cause to either macroeconomic imbalances or speculation itself, which in turn are based on fundamentally different views of the economic environment. In the neoclassical economics literature, three "generations" of exchange rate models have been offered as theories of currency crises (Kaminsky, 2008). In the first-generation models (coinciding with the Latin American crises of the 1960s), real or fundamental imbalances in the current account, sourced in monetized fiscal deficits, drive a loss in international reserves. In the second-generation models (roughly associated with the European Monetary System's crisis of the early 1990s), governments face competing objectives that force a tension between defending a pegged exchange rate and devaluing the currency. In the third-generation models, emerging after the currency crises in the late 1990s, focus shifts away from traditional macroeconomic policy choices towards the roles played by information asymmetries and financial regulation in the observed "twin" (currency and banking) crises in Asia, Brazil and Russia, for example. In all generations of neoclassical models, macroeconomic imbalances ground investor fears of instability.

Contrariwise, post-Keynesian theories privilege the destabilizing effects of Keynesian-

like speculation (see Davidson, 1997). Grounded in a view of the world that sees future market valuations as uncertain and unknowable, Keynes (1936, pp.158–9) introduced the now-familiar distinction between speculation – as “the activity of forecasting the psychology of the market” – and enterprise or the “activity of forecasting prospective yield of assets over their whole life”. When a market psychology emerges independently of real economic developments, investors turn their energies to forecasting the average opinion of other investors – or anticipating what average opinion expects the average opinion to be, to recall Keynes’s famous description of the judging behaviour in his beauty contest analogy. In the post-Keynesian schools of thought, speculation may have real economic consequences, and will when, as Keynes stated, “enterprise becomes the bubble on a whirlpool of speculation” (ibid., p. 142). Such outcomes are never more of a risk than in highly liquid asset markets such as foreign currency markets (see Spotton Visano, 2006). In these classes of models, speculation creates macroeconomic imbalances and currency crises.

Forms of prevention variously prescribed (see Dimand and Dore, 2000) are dependent on the assumed theoretical cause. Proponents of a neoclassical explanation advocate in favour of greater “free” market discipline and a diminished role for government in the provision of goods and services to constrain macroeconomic imbalances. Keynes advocated a system of strict capital controls, thus disciplining investor speculation and preserving national monetary autonomy. For disciplining investor speculation, James Tobin (1978) emphasized price, rather than quantity, incentives in his proposed tax on foreign currency transactions. As a means of raising the cost of speculative transactions, levying a “Tobin tax” would “throw some sand in the wheels of our excessively efficient international money markets” (Tobin, 1978, p. 154). Paul Davidson (1997) dismisses the potential effectiveness of the Tobin tax – arguing the likely possibility that expected gains from speculation could easily outstrip the cost of a speculative tax – and advocates in favour of a supranational settlement system designed to stabilize both global effective demand and international capital flows. Of course, a single currency would eliminate entirely the possibility of exchange rate fluctuations, but then national monetary autonomy would be sacrificed, as Walter Bagehot (1868) noted nearly a century and a half ago.

BRENDA SPOTTON VISANO

See also:

Asymmetric information; Bagehot, Walter; Capital controls; Capital flight; Convertibility law; Cross-border retail banking; Financial crisis; International settlement institution; Sudden stops; Tobin tax; Twin crises.

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D

Debasement

Debasement refers to the practice of lowering the purchasing power of money. The notion of debasement is much easier to understand in the case of commodity money; that is, when the means of payment has its own intrinsic value such as silver or gold coins. History is replete with examples of various kinds of debasement. The first, and the most natural and innocent of all, takes place when coins lose part of their weight, and therefore value, during their circulation just from frictions. There are also less natural and therefore less innocent “frictions” such as those described as “sweating”; that is, putting many coins together in the same (usually leather) bag and shaking them so that the dust worn off could be used as metal.

These methods of debasement, along with many similar ones, were not as effective as the practice of “shaving”, that is, shaving off parts of the periphery of the coins (a job done usually by artists) and reducing their precious metal content, using the removed metal to construct new coins or simply to produce luxury goods. This is one of the reasons why ancient coins rarely remained exactly rounded. Modern coins, by contrast, have a peripheral ring around their edges, reminiscent of the efforts to avoid the old practices of shaving or clipping off the coins at their edges. The peripheral ring of the coins, today, serves other more noble purposes, enabling their recognition by people with impaired visibility.

So far we dealt with the private sector of the economy, but a great deal of debasement occurred in the public sector of the economy as well, where there was a lowering of the precious metal content of the coins with the purpose again of constructing new coins from the removed quantity of the precious metal of the old ones.

The often-cited example is the denarius, the official coin of ancient Rome. The value of the denarius decreased over time as the government reduced its silver content. The immediate result of the debasement of the currency in ancient Rome was inflation, which reduced the purchasing power of the people’s currency and, at the same time, made it possible for the government to carry out its expenses at a much lower cost.

Another famous instance of debasement took place in the United Kingdom during the 1540s. The face value of the pound in 1551 represented only one-fourth of the precious metal (silver) content it had in 1542. The difference, or the financial gain, between the face (or official) value of the coined money and its actual production cost was called seigniorage, and helped the UK government to defray its expenditures.

It is interesting to note that in periods of debasement the so-called Gresham’s law comes into play. Gresham’s law is sometimes expressed as “bad money drives out of circulation good money”. Simply put, the public will tend to hoard the good (or undebased) money, and use the debased money for its payments. As a consequence, the bad (or debased) money remains in circulation, and the good money goes into hoarding.

Debasement is a practice easily recognizable in the case of commodity money. However, we cannot say the same thing in the case of a fiduciary or fiat monetary system, which is not directly backed by a commodity: the money in circulation is instituted as such by government. The altering of value in a fiat money system is a much more difficult practice

and occurs when the money supply exceeds its demand. In this as in all cases, where supply exceeds demand, the price or (effectively the same thing) the purchasing power of money declines. In other words, the excess supply of money gives rise to an inflationary process, which, by and large, is in favour of debtors and against creditors. Since governments are usually debtors, debasement might be a method for redeeming public debt.

Potentially, the process of inflation can also be set off by the fractional reserve system characterizing the operation of financial institutions. Under fractional reserves, banks can lend out more money than they have in reserves. Money supply therefore increases in a multiple way and this contains the potential for inflation, and thereby debasement. There might also be a less frequent case of debasement, namely as a result of currency redenomination, when a new unit of currency is introduced to replace an old one.

LEFTERIS TSOLFIDIS

See also:

Commodity money; Fiat money; Fractional reserve banking; Gresham's law.

Debt crisis

A debt crisis occurs when a nation-state is unable to meet its sovereign debt service obligations. A variety of operational definitions in the empirical literature relate in one way or another to indicators of debt-servicing difficulties: missed interest payments, missed principal payments, widening sovereign debt interest rate spreads and the like (see Pescatori and Sy, 2004). Notably, the label of a “debt crisis” is often affixed before any outright debt default occurs, and, as such, the crisis represents as much a crisis of confidence as any threat of actual default.

Although debt crises have a long history (see Eichengreen and Lindert, 1989), it was the experience of several global South countries in the 1980s that captured the attention of the contemporary international financial community. Informed by neoclassical economic theory, analyses of these crises assumed macroeconomic imbalances were due to inadequate market discipline creating fiscal deficits that caused the crises. The consensus opinion on a resolution saw country after country forced to “liberalize”, “privatize”, “deregulate”, and generally cut public spending as conditions of the bailout packages. The result was “a dramatic global episode that had profound and lasting effects on international financial flow patterns [. . .] and developing country economic policy” (Barrett, 1999, p. 185). The considerable human costs, social dislocation and rising income inequality resulting from the forced structural adjustments compounded the considerable resource costs of the crises to people and nations least able to pay (see George, 1989).

In the midst of a more recent wave of crises, one finds in mainstream literature discussions of multiple crises and a growing acknowledgment of the complex interactions that render it difficult to pinpoint a single causal process. “[T]he sovereign debt crisis is deeply intertwined with the banking crisis and macroeconomic imbalances that afflict the euro area [. . .]. Even if the crisis was not originally fiscal in nature, it is now a full-blown sovereign debt crisis” (Lane, 2012, p. 50).

Where a nation's ability to service its debt depends on income available to make interest

payments, rising domestic debt-to-Gross-Domestic-Product (GDP) ratios beg the question: how much debt is too much? Near the end of 2012, with Greece's public debt having reached approximately 140 per cent of GDP, a crisis emerged that continues (at the time of writing) to wreak havoc with the local economy. Japan, by contrast, has thus far avoided the panic of a crisis despite the fact that its gross debt is fast approaching 240 per cent of the country's GDP. Where true uncertainty in the Keynesian sense shapes the economic environment, future profitability from a given investment is unknowable. In an economic environment of the type envisioned by Keynes (1936), we lack the ability to assess the appropriateness of any level of debt incurred (see Spotton Visano, 2006) and must look beyond economic activity to understand fully the threat to confidence in a nation's ability to meet its debt-service obligations.

As with all financial crises, streams of income in excess of contemporaneous changes in debt-service costs define a debtor's margin of safety. Minsky (1986) explains a declining margin of safety over time with recourse to financing incentives that encourage and enable shorter-term borrowing for longer-term investments. Upward pressure on debt-service costs causes an increasing fragility that erodes the safety margin and eventually culminates in the threat of a default. The recent trends in "financialization" (that is, the increased dominance of financial securities in the tradeable value of commodities) and its extension to "securitization" (the consolidation of financial debt into bundled marketable instruments) are developments that have altered the structure of the financial economy and increased the speed with which a Minsky-like financial fragility emerges (see Girón and Chapoy, 2012).

Proponents of neoclassical explanations of a debt crisis advocate for preventative policies that focus on regaining macroeconomic balance primarily through market discipline (see Williamson, 2004–05). Post-Keynesians consider macroeconomic imbalances as the outcome, rather than the cause, of a financial fragility exacerbated by recent trends in the restructuring of finance capitalism. Davidson (2004–05) criticizes the neoclassical prescriptions, arguing that by creating perverse incentives these prescriptions set nation against nation. Davidson and other post-Keynesians tend to favour preventive policies that aim to stabilize global effective demand and curtail speculative financial capital flows.

BRENDA SPOTTON VISANO

See also:

Financial crisis; Financial instability; Financialization; Minsky, Hyman Philip.

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Debt deflation

First identified by Fisher (1933) as the cause of the Great Depression in the 1930s, debt deflation is a cumulative process of declining output and prices set in train by an excessive level of private debt coinciding with low rates of inflation.

Fisher (*ibid.*, p. 339) emphasized the importance of disequilibrium in this process, noting that even if we assume that economic variables tend towards equilibrium, "[n]ew disturbances are, humanly speaking, sure to occur, so that, in actual fact, any variable is almost always above or below the ideal equilibrium".

Given the starting positions of a higher than equilibrium level of debt and a lower than equilibrium inflation rate, debtors are forced to undertake distress sales at reduced prices, which causes both deflation and a fall in the amount of money in circulation as debts are paid off. The reduction in debt is less than the fall in nominal GDP, leading to an increase in the real debt burden even though nominal debt levels fall – a situation that Fisher (*ibid.*, p. 344, *italics in original*) described as "the great paradox which, I submit, is the chief secret of most, if not all, great depressions: *The more the debtors pay, the more they owe.*"

Fisher's (1933) thesis was ignored by neoclassical authors on the grounds that "debt deflation represented no more than a redistribution from one group (debtors) to another (creditors). Absent implausibly large differences in marginal spending propensities among the groups [. . .] pure redistributions should have no significant macro-economic effects" (Bernanke, 2000, p. 24). However, debt deflation was taken up by Minsky in his Financial Instability Hypothesis, with Minsky citing Fisher's work before his first citation of Keynes (see for example Minsky, 1963).

A key aspect of Minsky's interpretation of Fisher (1933) was the emphasis upon endogenous money, and the role of rising debt in causing aggregate demand to rise during "normal" times: "For real aggregate demand to be increasing [. . .] it is necessary that current spending plans [. . .] be greater than current received income [. . .]. It follows that over a period during which economic growth takes place, at least some sectors finance a part of their spending by emitting debt" (Minsky, 1982, p. 6). Conversely, a debt deflation can be seen as a period when deleveraging by debtors implies that current spending plans are lower than received income, leading to economic contraction driven by insufficient aggregate demand.

The data appear to support Fisher's and Minsky's arguments about the pivotal role of deleveraging in causing the Great Depression. Private debt peaked in mid 1929 at 163 billion US dollars and fell to a temporary trough of 124 billion US dollars by mid 1934 (it fell again between 1937 and 1939, and again sharply from mid 1943 till 1945), reducing aggregate demand below income according to Minsky's argument. The fall in debt between mid 1929 and mid 1932 was, however, proportionately smaller than the fall

in nominal GDP (from 97.5 billion to 55.2 billion US dollars), so that the debt-to-GDP ratio actually rose, from 175 per cent in 1930 to 235 per cent in 1932, thus confirming “Fisher’s paradox”.

The economic crisis that began in 2007 is also alleged to be a debt deflation (Keen, 2013, pp. 19–21). Aggregate private debt in the United States peaked at 42.5 trillion US dollars in January 2009, and fell to 38.8 trillion US dollars by July 2011, while the annual growth in debt went from a peak of +4.2 trillion US dollars per annum in August 2007 to a trough of –2.8 trillion US dollars per annum in March 2010; US nominal GDP was respectively 14.2 and 14.3 trillion US dollars on those dates. On Minsky’s metric that rising debt enables spending to exceed income (and vice versa during a depression), this implies that aggregate private sector expenditure peaked at 18.4 trillion US dollars in August 2007, after which it fell to 11.5 trillion US dollars by March 2010.

The key differences between the Great Depression and the post-2007 crisis (currently generally referred to as the Great Recession) appear to be the much smaller rate of deflation, and the much larger and faster government response to the Great Recession.

The annual rate of inflation was below zero in the United States between early 1930 and late 1933, with the peak rate of deflation being 10.67 per cent in mid 1932. In contrast, deflation during the Great Recession was short-lived: in the United States the consumer price index fell between January and September 2009, with the peak annual rate of deflation being 2 per cent. This may reflect both the scale of the government response (discussed below), and the different sectoral composition of private debt in the United States: in 1929, 125 percentage points of the 175 per cent private-debt-to-GDP ratio were held by non-financial businesses (with households and financial businesses accounting for roughly 25 per cent each); in 2009, business debt peaked at 82 per cent of GDP, well below the 1929 figure and lower than both household and financial sector debt (97 per cent and 123 per cent respectively). There was thus less direct pressure on businesses for “distress selling” in the Great Recession, though arguably there could be a more persistent problem with lower demand from an over-gearred household sector in future years.

The US government deficit-financed spending during the Great Depression reached 6.5 per cent of GDP in mid 1931, and then fell to below 4 per cent by mid 1932, followed by another rise to a peak of 8.6 per cent with the New Deal in 1934. By contrast, US government deficit-financed spending began at over 2.5 per cent of GDP when the crisis began in late 2007, and rose to 14 per cent of GDP in mid 2009. This huge and sustained government stimulus, combined with Federal Reserve monetary operations, clearly buoyed aggregate demand in line with Minsky’s arguments in favour of “Big Government” as a stabilizing force during an economic crisis.

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See also:

Consumer price indices; Deleveraging; Endogenous money; Financial instability hypothesis; Minsky, Hyman Philip.

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Deleveraging

Deleveraging is the process by which either economic units (taken individually) or the economy as a whole get rid of their debts. The most obvious way of carrying this out is by repaying existing debt, which should result in the aggregate stock of debt decreasing. However, while debt may fall in nominal terms, the attempt to deleverage – that is, to repay debts accumulated in the past – can increase the burden of debt in real terms.

According to Fisher (1933), repaying the debt implies a decrease in the means of payment in circulation and therefore a fall in the price level. This logic is based on the quantity theory of money. As a result, this fall would increase the debt in real terms; during a crisis, therefore, the attempt to repay debt would result in a larger debt. This means that if all units simultaneously try to deleverage, a debt deflation could occur, resulting in a self-defeating exercise.

This is what happened during the 1929 financial crisis. In other episodes of banking crises, the deleveraging by the private sector was offset by an increase in public debt, which avoided debt deflation. For instance, this occurred in the United States during the 2008–09 global financial crisis. However, this was not the case in the euro area. Rather, as households and firms were trying to get rid of previously accumulated debt, some countries, especially those in the periphery of the euro area, were constrained by fiscal rules, which were agreed upon at the European Union level, but also by pressure by financial markets to cut government deficits in order to reduce debt. Hence, both the public and private sectors were trying to increase their savings at the same time. This uncoordinated effort resulted in a fall in income, which in turn caused a further round of cuts in government expenditures and increases in taxes as the objectives of a falling public debt as a ratio to GDP had not been achieved. Note, however, that the attempt to repay the debt did not directly cause a fall in credit and in the price level, but a fall in nominal income and in the price of assets.

While the rate of change in the price level has not become negative on average, it has nonetheless slowed down. Prices of financial assets and real estate have declined, because the private sector was selling assets to a greater extent than before the crisis, in order to repay old debts and, above all, to be able pay the new higher taxes, particularly those on real estate.

Further, owing to the discrepancies between euro-area countries' interbank and financial markets, long-term interest rates (measured in a way that allows comparisons – the so-called harmonized long-term interest rates for convergence assessment purposes) have increased between 4 and 10 per cent for those countries that have experienced large cuts in government deficits as well as increases in government debts (see European Central Bank, 2014, p. 51). In these countries, the rate of growth of credit to the private sector has been negative throughout the 2011–13 period (*ibid.*, p. 49). If the higher interest rate is used to discount future income flows, then the present value of these assets will decline. Because of the low rate of increase in prices, the real value of debt and real interest rates are rising.

Under these policies, a debt deflation process as described by Fisher in the 1930s, which affects not only the general price level but also the price of assets in a Minskyan way, has begun (see Minsky, 1986; Tropeano and Vercelli, 2014). The fall in income out of which debt is repaid means in the end that debt cannot be repaid and that the deleveraging attempt has failed.

DOMENICA TROPEANO

See also:

Asset price inflation; Debt deflation; Euro-area crisis; Financial crisis; Minsky, Hyman Philip; Quantity theory of money.

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Deutsche Bundesbank

The international fame of Germany's central bank, the Deutsche Bundesbank, rests on West Germany's low inflation record in the post-Second-World-War era, which, including the high-inflation 1970s, averaged 3 per cent over the 50-year history of the deutschmark from 1948 to 1998. "Buba", as the bank is called in the markets, has a reputation as an inflation hawk. Held in awe in some international political and financial circles, but scorned in others, the Bundesbank has established a firm backing in German public opinion and has generally enjoyed respect and support from across the political spectrum, too. Despite becoming part of the Eurosystem and surrendering its *de facto* monetary reign over Europe to the European Central Bank (ECB) with the euro change-over in 1999, the Bundesbank continues to wield disproportionate political power in policy debates both in Germany and at the European level today.

Viewing the (Deutsche) "Reichsbank" founded in 1876 as part of the to-be-dismantled centralized power machinery of Nazi Germany, the re-establishment of central banking in the three Western occupation zones of defeated Germany after the Second World War followed the decentralized model of the Federal Reserve System in the United States. In March 1948, the regional central banks (*Landeszentralbanken*; LZB) established since 1947 in the individual German *Länder* (states) were supplemented by a new *Bank deutscher Länder* (BdL) supposed to function as their federal headquarters. The BdL was located in Frankfurt and had representatives from the LZB on its Governing Council of policy makers as well as an Executive Board of managers. On British insistence, erecting the BdL as a proper bank rather than a mere (decision-making) board, the BdL was a preparatory measure for the planned Currency Reform of June 1948 (Häuser, 1998; Bernholz, 1999; Buchheim, 1999; Distel, 2003). The Allies' introduction of the deutschmark in conjunction with general price liberalization under the initiative of Ludwig Erhard, West Germany's later legendary minister of economic affairs, became seen as the foundation of the German "economic miracle" that ensued in the 1950s.

The establishment of the BdL and the birth of the deutschmark, which in due course

became the subject of glorification by association with West Germany's re-emergence from the socio-economic and political cataclysm of the Second World War, thus preceded the election of the first federal government of the Federal Republic of Germany in September 1949. By its statutes the BdL was also "independent" of political control by the German states. This guaranteed the Allied powers' full authority over the central bank still lacking a State, with control being exercised through the Allied Bank Commission (residing with the BdL under the same roof).

The end of Allied control then led to the Transition [central bank] Law of 1951, a hard-fought-over compromise between the BdL and the federal government of Konrad Adenauer. The compromise formula foresaw that the BdL was independent from government instructions in safeguarding the currency but obliged to take into account and support the government's economic policy – a formula that made its way into the Bundesbank Law of 1957 and properly established the peculiar German tradition of central bank independence (Bibow, 2009, 2010). As West Germany's Basic Law (*Grundgesetz*) of 1949 featured the obligation for the federal government to establish a "Bundesbank", the new Bundesbank finally superseded the BdL in 1957, reforming the latter's decentralized structures while retaining broad *Länder* representation on the Governing Council (Spindler et al., 1957; Hentschel, 1988).

Price stability causes economic growth, according to Bundesbank mantra. Under the peculiar conditions after the Second World War, that was actually true for West Germany. With exchange rates generally pegged to the US dollar and German inflation rates lower than in key trading partners, relative price stability boosted German competitiveness and fired the country's export-led growth (Holtfrerich, 1999). Economic growth was broad-based, as constructive labour relations secured wage growth broadly in line with productivity trends and the stability norm of 2 per cent inflation. The Bundesbank's role was that of a referee enforcing discipline upon social partners and finance ministers. The Bundesbank stood ready to slam the brakes, but refrained from stimulating domestic demand; waiting for exports to kick in instead. The model worked well for all concerned, not least the Bundesbank itself, establishing its low inflation fame without harming economic growth. West Germany became notorious for running persistent current account surpluses though (Bibow, 2013).

The model became unclenched in the 1970s with the demise of the Bretton Woods regime and oil price shocks. West German inflation rates climbed to over 6 per cent in 1973 and again in 1981, although peaking well below levels reached elsewhere. The deutschmark appreciated and gradually attained reserve currency status. Applying fiscal stimulus in the late 1970s under international pressure, West Germany had a current account deficit by 1980.

Fundamental policy changes with lasting European ramifications occurred in 1982–83. As the Bundesbank squeezed the rate of inflation back down to 2 per cent, the new government of Helmut Kohl branded fiscal austerity and supply-side economics as West Germany's unquestioned policy wisdom. Keynesian ideas were declared obsolete. Once again, it could only work for West Germany because others behaved differently. Indeed, the European Monetary System delivered a revival of the old export-led growth model. The deutschmark became Europe's anchor currency as France adopted its "*franc fort*" policy in 1983 (Bibow, 2013). *De facto* the Bundesbank now determined European monetary policy, albeit with a legal focus on price stability in Germany (Marsh, 1992).

Both economically inefficient and politically unacceptable for Germany's European neighbours, this evolution energized the forces for deeper European integration. The idea of augmenting Europe's single market by a single currency rapidly gained strength; even more so when German unification approached. Its peculiarly powerful position both within Germany and Europe allowed the Bundesbank to dictate the conditions for abdicating its monetary reign. As a result, the "Maastricht regime" of Economic and Monetary Union (EMU) is largely of German design, with the Bundesbank serving as model for the ECB (Bernholz, 1999; James, 2012).

Today, the Bundesbank is part of the pan-European central bank system that manages the euro. Propagating Germany's price stability culture and nourishing its own reputation as an inflation hawk, the Bundesbank continues to enjoy a special status not only in Germany, but also within the whole Eurosystem. Not shying away from challenging the system's supposed leader, the Bundesbank has opposed ECB decisions aimed at countering renewed financial fragmentation within the euro area. The Bundesbank advised Germany's constitutional court that the ECB may be overstepping its mandate in "doing whatever it takes" to secure the euro's survival – arguably behaviour suggesting that the Bundesbank may be planning for life in Germany after the euro.

JÖRG BIBOW

See also:

Bretton Woods regime; Central bank independence; Euro-area crisis; European Central Bank; European monetary union; Federal Reserve System.

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Development banks

Arriving at a concrete definition of development banks is surprisingly tricky, as they have existed in many parts of the world in different forms for centuries. Yet development banks can be broadly defined by their ownership, how they source their funding, and how funding is distributed. Development banks in almost all cases are owned by the State. Unlike private banks, which are created in order to generate profit, development banks are created as macroeconomic policy institutions. This dynamic is not limited to developing countries, or even to central governments. The socialization of finance through development banks has occurred in many forms under governments of different size, location, historical period, and political leaning.

While the criterion of ownership is a necessary element in defining development banks, it can also create confusion. Many State-owned financial entities that were not created to be development banks have in diverse times and places assumed roles typically assigned to development banks: central banks and State-owned commercial banks have in many instances channelled government funds to specific economic activities generally considered to be part of economic development. Yet the ownership criteria can also make things clear. Institutions that are officially dedicated to economic development, such as the Asian Development Bank, the Inter-African Development Bank, and the Inter-American Development Bank, are not owned by the States in whose territory they operate. These banks were originally created in the post-war period to support foreign currency financing for developing countries, yet their institutional operations have since changed considerably.

The second criterion to define development banks – the sourcing of their funds – is likewise variable. Development banks can operate much like a commercial bank in taking deposits and giving loans directly to their constituency of eligible lenders, generally defined by the type of economic activity in which they are engaged. Interest rates may or may not be subsidized by the State. Development banks may also operate exclusively as second-tier institutions in essentially two forms. The first is for them to guarantee selected assets in the financial system. A government can select borrowers and projects in a much more direct fashion under the second modality, in which government revenue is channelled through a development bank to specific lenders. Development banks can therefore operate much like private banks in the sense that they can act as simple financial intermediaries that channel savings into investments, or they can eschew this temporal constraint by *ex-nihilo* credit creation.

The third criterion defining development banks – to whom this socialized finance is directed – also differs widely, as development banks tend to closely follow the position of the government that controls them. Historically, common mandates have been to promote exports, agricultural activity, and infrastructure projects. In more recent times, small and medium-sized enterprises have also been prominent beneficiaries of public support.

During the golden age of capitalism, in which some aspects of Keynesian thinking, like the socialization of finance, were put into practice, development banks became the financial engine of the only sustained period of progress towards economic development in many countries' history. In recent decades, as the neoliberal paradigm has become dominant, the concept and practice of socialization of finance has fallen out of favour

with policy makers. Among developing countries, State-owned banks controlled almost 70 per cent of total bank assets in 1970, a number that had fallen to below 50 per cent by 1995 (see Inter-American Development Bank, 2004). Latin America witnessed the most pronounced decline. Under various programmes of privatizations, closings and reductions in operating scopes, banking assets in the hands of development banks have fallen to much lower levels in much of the region.

A common refrain in the containment of development banks was that they represent “unfair competition” to their private sector peers. This criticism is closely related to the more generalized criticism regarding the role of the State in the economy, which holds that development banks increase public debt and destabilize the economy. A further critique centres on the cost–benefit relationship, and claims that this type of bank has high bureaucratic costs and is vulnerable to corruption.

Indeed, development banks have often been considered as superior competitors with regard to private banks. As State-owned entities, development banks face only political limits, as their economic or financial limits are merely those of the State. Therefore, unlike private banks, they cannot be bought by competitors or go bankrupt. Yet history has shown that development banks have been mainly beneficial to private banking. In many poorer countries, financial systems were non-existent before the establishment of publicly-owned banks, and where these banks have been closed, declines in economic activity have likewise diminished the sources of private bank profit. Likewise, public banks have provided support to financial systems in times of crisis, thereby indirectly aiding their private peers.

If a country does fall into a systemic financial crisis, State-owned banks are relatively immune to market forces during moments of financial instability, as these institutions can operate at a loss for indeterminate periods of time. The relative permanence of State-owned banks allows these institutions to extend credit when market pressure does not allow their private-sector peers to do so, and can even act as custodians of failed banks until market conditions improve.

Despite the various criticisms of development banks in particular, and the socialization of finance in general, such institutions have in different times and places acted as financial engines for economic development.

WESLEY C. MARSHALL

See also:

Finance and economic growth; Financial crisis; Financial instability; Money and credit.

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Dollar hegemony

Today, the world economy operates under the artifice of US hegemony, fortified by the US dollar as an international reserve and vehicle currency. How did the United States arrive at achieving such pre-eminence?

From 1944 to 1973, the financial architecture of the world economy centred on a US-engineered Keynesian accumulation agenda as a response to the devastation wrought by the Great Depression. The capitalist institutional structure, or social structure of accumulation (see Kotz et al., 1994), rested on finance being subservient to the promotion of industrial enterprise.

With socially-engineered capital-labour compromises in developed countries, neo-colonial governing institutions in the Third World, active State regulation in decisions with respect to capacity utilization, and a co-respective form of competition among large corporations set by regulations that brought together monetary authorities and large banks as well as large industrial capitalists, the post-World-War-II system was the era of “regulated capitalism”. Altogether, the world system was underpinned by the Bretton Woods arrangement, which called for globally fixed exchange rates against the US dollar tied to the price of gold and capital controls.

The international political-economic conditions were such that domestic macro-economic autonomy, specifically with respect to monetary policy, for aggregate demand management could be feasible. Capital controls were seen as essential to reduce the volatility of capital flows and allow for low interest rates with the objective of pursuing full employment. As Keynes (1980, p. 276) argued, “we cannot hope to control rates of interest at home if movements of capital moneys out of the country are unrestricted.”

By the 1960s, however, US officials began to actively encourage the growth of the Euromarket: that is, the pool of unregulated US dollar reserves concentrated in the City of London (Helleiner, 1994). With traditionally marginalized segments of the population in developed countries, particularly in the United States and in Western Europe, demanding social, political and economic rights, and with national liberation movements in the Third World overthrowing US-supported oppressive governments, calls for an expanded role of the State in meeting citizens’ needs dramatically circumscribed global capital accumulation owing to heightened nominal wage-price spirals. Consequently, the global capitalist rate of profit fell (Duménil and Levy, 2004, p. 24). The Euromarket thus became the means for international financial markets to re-establish their influence, lost as a result of the Great Depression, and allow industrial enterprise to rebuild the conditions for future profitability via offshoring.

Speculative capital flows, however, began to undermine the capacity for the United States to guarantee the convertibility of US dollars into gold at fixed parity (Triffin, 1960). Even though the US dollar was the key international currency, it was fixed to gold. As such, debt was ultimately redeemable in an asset that was not directly controlled by the US monetary authority. Default was a possibility, even if a remote one, as through manipulation of the rate of interest – and through coercion and cooperation with other central banks in the world economy – the stability of the system could be maintained. With the globalization of finance via the Euromarket, nevertheless, speculation against the gold-dollar parity proliferated, making functional finance on a worldwide basis difficult to manage.

In the early 1970s, Nixon closed the gold window and loosened capital controls. American officials concluded that it was no longer in their interests to maintain the linchpin relation between gold and the US dollar, and *ipso facto* withdrew support for the Bretton Woods system by which exchange rates were fixed and flows of capital were to a large degree controlled (see Helleiner, 1994; Vernengo, 2003; Ingham, 2008). The

deregulation of financial markets established a global market of mobile financial capital, and the US dollar established itself as a global fiat-money standard. The world economy moved from a fixed dollar standard to a flexible dollar standard (Serrano, 2003).

For the first time in history, it is possible for the hegemonic country, in this case the United States, to be a global debtor, as national States are within their domestic economies, and to provide a default-risk-free asset to facilitate global capital accumulation. The risk that the United States would be unable to expand demand globally, because it is forced to maintain a fixed exchange rate between its currency and an external asset, is thus non-existent. It is true, however, that foreign countries and agents may show unwillingness to hold US-dollar-denominated assets, but, as in the domestic case, the US Federal Reserve (Fed) can always monetize public debt. This would be inflationary and lead to a run on the US dollar only if there were currency substitution on a massive scale, which would require a credible alternative to the US dollar (which does not exist yet). As such, the United States can therefore incur foreign debt without any reasonable limit.

Global imbalances, in particular the large US current account deficits that reflect their so-called “exorbitant privilege”, are instrumental for the functioning of the world economy, as evidenced by the dominance of the US dollar in international trade (Fields and Vernengo, 2013). An important part of this is associated with the fact that key commodities, like oil, are priced in US dollars in international markets. This not only implies that there cannot be an insufficient amount of dollars for the United States to import key commodities, but also that a depreciation of the US dollar does not necessarily reduce US imports (Parboni, 1981).

In fact, the Fed is the world economy’s central bank, which acts as the safety valve for mass amounts of international liquidity (Arrighi, 1999). The hegemonic position of the US dollar structures the world economy in such a fashion that the United States determines the international transmission mechanism for global economic activity. Hence, the role of the US dollar in international markets, and the advantages that come with it, are the spoils of structural power. The provision of this asset allows the United States to become the source of global demand, and to insulate itself from fluctuations and contradictions of perilous cumulative disequilibria that may arise in the world economy. The US dollar enables the United States to set the global social, political, and economic conditions, within which the transmission of misery (contagion) between countries, and between global and national levels, is essentially regulated.

DAVID M. FIELDS

See also:

Bancor; Bretton Woods regime; Capital controls; Dollarization; Fiat money; Keynes Plan; International settlement institution.

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Dollarization

Dollarization is a monetary regime where a country adopts a foreign currency, usually the US dollar, as a means of payment for its residents’ transactions, instead of its own domestic currency. Dollarization can be full or partial and, in most cases, it is implemented as a preferred choice for countries looking for monetary stability and protection from exchange rate volatility. Most countries that have dollarized their economy have done so during periods of economic instability. They also tend to have major economic links with the US economy whether through tourism, trade or as the recipient of significant US aid.

Full dollarization arises when a country completely abandons its own currency and adopts a foreign currency (very often the US dollar) in all its residents’ financial transactions and dischargement of debt. All assets and liabilities are thereby denominated in that foreign currency; the national central bank stops issuing local currency. Ecuador is a noteworthy example, as it officially dollarized its economy in January 2000; El Salvador followed in 2001, while Panama dollarized in 1904.

Partial dollarization, also known as *de facto* dollarization or semi-official dollarization, occurs when a country allows a foreign currency (the US dollar) to circulate alongside its local currency and be used as a means of payment (see Calvo, 1996). This practice can be formal and regulated, or informal without official and legal framework. Partial dollarization is fairly widespread as several countries today have many of their assets and liabilities denominated in US dollars. Countries that are partially dollarized are the Bahamas, Cambodia, Haiti, Laos, and Liberia, among others.

Full dollarization is said to carry significant economic advantages, although there can be some important disadvantages as well. With respect to *de facto* dollarization, Eichengreen and Hausmann (1999) argue that the inability of a country to issue debt in its local currency leads to further weakening of the domestic financial market. The authors call this situation an “original sin”, as the *de facto* dollarized economies are often financing local investment with US dollars only for those projects that generate revenue denominated in local currency. The solution, for these authors, would be to fully dollarize.

However, three further problems exist with dollarization: the loss of seigniorage revenue, the loss of control over monetary policy and interest rates, and the loss of the central bank’s role as lender of last resort for dollarized countries. Hence, dollarized countries lose most of their economic policy tools that are critically needed during a crisis. A dollarized country would be in even greater hardship if the US economy were performing poorly and were the source of the crisis.

Dollarization poses obvious challenges for central banks in conducting monetary policy. If the central bank does not issue its own currency, it loses sovereignty over monetary policy, and hence cannot set interest rates. In the absence of the ability to operate in their interbank markets, dollarized countries therefore must depend on interest rates set by the US Federal Reserve System. In tandem with this, central banks also lose their role as lender of last resort, and policy makers can no longer intervene in order to stabilize their banking system or conduct expansionary fiscal policy. A dollarized country can only spend what it earns or what it borrows on international markets at current interest rates. Deficit spending is not possible.

Another disadvantage associated with dollarization is the issue of national pride and the loss of a currency that usually carries a national symbol.

However, full dollarization presents some advantages, it is argued. The elimination of a currency necessarily implies the elimination of exchange-rate devaluation or volatility, and therefore of exchange-rate risk. This should increase foreign confidence and boost foreign direct investment. Further, some economists argue that dollarization reduces transaction costs related to trade between countries using the same currency. For instance, according to Rose (2000), dollarization leads to significant increases in trade and greater economic integration between the dollarized economy and the United States.

Berg and Borensztein (2000) also cite among the benefits of dollarization lower inflation and interest rates. As such, the principal attraction for countries to dollarize would seem to be the expectation that the elimination of exchange rate risk will lead to greater stability in international capital flows, trade and therefore economic growth (Grubel, 1999).

Finally, dollarization is not the same as currency union, as under the latter all countries abandon their currency in order to adopt a newly-created currency. An example of this is the euro. In a dollarized regime, the United States does not abandon its currency, but retains full control over the conduct of its monetary policy, and bears no responsibility for setting interest rates according to economic conditions in dollarized countries. Also, the United States is under no obligation to offer a seat at the US Federal Open Market Committee to representatives of dollarized countries (Rochon and Seccareccia, 2003).

To date, full dollarization remains limited to few small economies, and its effects have been mitigated. Edwards and Magendzo (2006) empirically studied a number of countries that proceeded with currency substitution in general and dollarization especially, and found a combination of two outcomes. Even though the rate of inflation was indeed lowered, other macroeconomic variables like growth of per-capita gross domestic product and employment levels were not decisively affected by the adoption of a stronger foreign currency.

MEHDI BEN GUIRAT AND LOUIS-PHILIPPE ROCHON

See also:

Dollar hegemony; Federal Open Market Committee; Federal Reserve System; Interest rates setting; Lender of last resort; Original sin.

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Draghi, Mario

Mario Draghi (1947–) is an Italian economist who has held and holds important political offices. At the time of writing, he is the President of the European Central Bank (ECB).

Draghi's vision of economic policy is partially, but significantly, influenced by Keynes's theory, although he explicitly affirmed that monetary policy "can become an effective, stabilising factor and contribute to collective prosperity in an independent and active way" only if monetary policy decisions are built "into a systematic and predictable strategy, based on price stability, which drives expectations and guides the economy but doesn't shock it" (Draghi, 2012a).

After receiving a Jesuit secondary education, Draghi graduated in 1970 from the University "La Sapienza" in Rome, under the supervision of the Keynesian economist Federico Caffé – the revolutionary reformist who suddenly disappeared in 1987 – and with a dissertation entitled *Economic Integration and Variation of the Exchange Rates*, in which he criticized the project of the single European currency (see Draghi, 2012a, minutes 25:00–25:22). He received a PhD from the Massachusetts Institute of Technology in 1976 under the supervision of Franco Modigliani and Stanley Fisher. During the 1980s, Draghi taught economics at the University of Florence and worked for the Inter-American Development Bank and the World Bank in Washington, DC. In 1990, he was hired as economic advisor at the Bank of Italy.

From 1991 to 2001, Draghi was Director-General of the Italian Treasury. In that position, he led the National Committee for Privatization. In February 1998, the Consolidated Act on Financial Intermediation weakened shareholders' syndicates and voting agreements, relaxed conditions for takeover bids, and introduced several provisions designed to protect minority shareholders. As a result, millions of individuals who had previously channelled their savings into government bonds were persuaded to become shareholders and privatizations of important public companies were made easier (Ranci and Prandini, 2004).

Draghi's reform of Italy's economic institutions has recently been deeply criticized by the Italian Court of Auditors: according to the Court's resolution 19/2012/G, the privatization of Telecom, Enel, Autostrade, and Ente Tabacchi could yield greater benefits to Italy, and the Committee chaired by Draghi played a more formal than substantial role (Corte dei Conti, 2012), giving too much power to Goldman Sachs, among other consultants. Some journalists gathered a possible conflict of interest in this regard. Indeed,

Draghi was a vice-chairman and managing director at London-based Goldman Sachs International from 2002 to 2005.

From 2006 to 2011, Draghi took over the governorship of the Bank of Italy and became Chairman of the Financial Stability Forum. In that position, Draghi showed an attentive capacity to understand the growing instability of the international financial system: “Current account imbalances, household indebtedness, large leveraged transactions in the corporate sector as well as the growth in market complexity should all be sounding alarm bells”, he said at the beginning of 2007 (Draghi, 2007). Not surprisingly, international financial fragility also represents his scientific field of research: in 2003 he had already proposed a New Keynesian theoretical model to analyse specific situations in which significant unanticipated and unintended financial risks are accumulated, offering a framework for measuring the extent of a government’s exposure to risk (see Draghi et al., 2003).

In 2011, Draghi was appointed as President of the ECB at a critical time, when the existence of the euro area was being put into question (De Grauwe, 2011; Bibow, 2013). At the beginning of his mandate (November 2011), Draghi decided to reduce the key ECB interest rates by 25 basis points. The theoretical approach he used to justify this non-self-explanatory decision is far from the monetarist Bundesbank orthodoxy. It is based on a model where the analysis of inflation precedes rather than following the analysis of the quantity of money (De Cecco, 2011). The ECB then changed course and Draghi initiated quantitative easing measures, notably two large-scale “Long-Term Refinancing Operations” (LTROs), providing banks with 1 trillion euros of three-year loans in December 2011 and February 2012. This achieved some temporary calming of financial conditions, encouraged some public debt purchases by banks, and had the net liquidity effect of boosting the ECB’s balance sheet by some 500 billion euros (Bibow, 2013).

In a famous speech in July 2012, Draghi (2012b) stated that “[w]ithin our mandate, the ECB is ready to do whatever it takes to preserve the euro”. He also recognized that the European Monetary Union had been ill-designed: “The euro is like a bumblebee. This is a mystery of nature because it should not fly but instead it does”.

Some post-Keynesian economists have expressed a clear appreciation of Draghi’s ability to conduct monetary policy during the euro-area crisis (Barbera and Holtman, 2012, p. 14). But the most recent actions of the ECB do not appear to be in line with post-Keynesian suggestions: although Draghi probably understands that (i) the euro-area crisis is a twin banking and intra-area balance-of-payments crisis, and (ii) policy makers would have to bring Southern Europe’s borrowing costs down and sustain debtor countries’ exports, he decided to endorse a so-called “Macroeconomic imbalance procedure” designed to asymmetrically punish deficit countries, preserving the greatest Northern European creditors (De Cecco, 2013).

The “monetary blockade” of Cyprus in March 2013, implemented by the ECB, has yet to be carefully studied, but it does not seem to have been a decision that was capable of reinforcing the euro area and the wider project for setting up the United States of Europe (see Sapir, 2013).

STEFANO LUCARELLI

See also:

Bank of Italy; Deutsche Bundesbank; Euro-area crisis; European Central Bank; European monetary union; Financial instability; Long-term refinancing operations; Quantitative easing.

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Effective lower bound

The effective lower bound, hereinafter used as a synonym for zero lower bound (ZLB) on nominal interest rates, describes a situation in which the policy-controlled short-run interest rate – to wit, the overnight repurchase agreement (repo) rate at which depository institutions borrow short-term funds from the central bank – is reduced to close to zero: to a level where it cannot be, for practical reasons, brought down any further.

In mainstream economics, the ZLB is deemed to pose a serious challenge to central banks, as it may push the economy into a “liquidity trap”, which, in turn, cripples the effectiveness of monetary policy and renders the latter unable to achieve the macro-economic objectives of low and stable inflation and sustained economic growth. This is so as, once the ZLB on nominal interest rates has been reached, central banks have no other option but to substitute standard interest rate policies (based upon the control of the nominal short-term interest rate) with non-conventional monetary policy instruments, whose ultimate impact on economic activity is highly uncertain.

Though its significance was downplayed during the “Great Moderation” (Japan was regarded as a special case), the ZLB has come to the forefront of academic and policy debates in recent years, prompting a great deal of research on the subject matter (see Svensson, 2010; Williams, 2010; and references therein). Following the onset of the global 2008–09 financial crisis, major central banks around the world aggressively lowered their policy rates of interest to ward off deflationary pressures and shield the “real side” of the economy from potential disruptions arising in the financial system. Several leading central banks (the Federal Reserve (Fed) and the Bank of England (BoE) are cases in point) already found themselves constrained by the ZLB on nominal interest rates in the aftermath of Lehman Brothers’ collapse in 2008. They were thus forced to rely extensively on alternative, non-conventional measures to prevent inflation expectations from falling to undesirably low (or even negative) levels and, hence, forestall a rise in the *ex-ante* real interest rate.

While various taxonomies exist, it is convenient to classify non-conventional measures into three broad categories (see Bernanke et al., 2004, pp. 7–24). The first category includes measures aimed at shaping market participants’ expectations of future short-term interest rates by providing explicit forward guidance as regards the future path of target interest rates and, hence, the monetary policy stance likely to prevail in the foreseeable future. At the apex of the financial crisis in 2008, several central banks signalled their intention to commit to low policy interest rates for an extended period of time. Some of them, like the Fed, have gone further, tying the “normalization” of interest rates to a specific time frame and, since December 2012, to the evolution of some relevant macro-economic variables, such as the rate of inflation and the unemployment rate (see Federal Open Market Committee, 2012).

The second and third categories of non-conventional measures encompass so-called “balance sheet policies”, which seek to alter the size and/or composition of the central bank’s balance sheet so as to put downward pressure on long-term interest rates and ease credit and financial conditions more generally. A distinction is drawn between

“quantitative easing” policies (the second category), which focus primarily on increasing the size of the central bank’s balance sheet through the expansion of bank reserves, paying little attention to the structure of the asset side; and “credit easing” policies (the third category) aimed at altering the composition of the asset side of the balance sheet in order to address disruptions in specific credit market segments and improve the availability of credit to the private sector (Bernanke, 2009). The large-scale asset purchase programme implemented by the Fed since late 2008, through which it has purchased large amounts of private and government assets, can be regarded as part of its “credit easing” policy.

Two other non-conventional measures have been proposed to alleviate the risk posed by the ZLB constraint. Notably, Blanchard et al. (2010) suggest potential benefits from raising the target inflation rate beyond the typical 2 per cent ceiling. Indeed, revising the inflation target rate (and inflation expectations) upward would be conducive to higher nominal interest rates, which, in turn, would provide central banks more leeway for conventional monetary policy easing before the ZLB on nominal interest rates is reached. On the other hand, Eggertsson and Woodford (2003) advocate price-level targeting as an effective means of creating expectations of higher inflation once an adverse shock hits the economy, thus mitigating the risk of hitting the ZLB. Whilst theoretically appealing, the relevance of these measures remains a matter of dispute. As a corollary to this, major central banks have refrained from either revising their target inflation rate upward or adopting a pre-determined price-level target after the inception of the 2008–09 financial crisis.

FABIO S. PANZERA

See also:

Carney, Mark; Corridor and floor systems; Financial crisis; Forward guidance; Inflation targeting; Interest rates setting; Liquidity trap; Policy rates of interest; Price-level targeting; Quantitative easing; Repurchase agreement; Zero interest-rate policy.

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Efficient markets theory

Efficient markets theory, as formulated by Fama (1970, 1991), rejects the existence of unexploited profit opportunities in financial markets, arguing that the actions

of profit-seeking traders will cause asset prices to reflect all available information. Acceptance of efficient markets theory implies nothing about whether financial markets coordinate investment and saving decisions in an orderly, socially optimal or stable manner, but only about whether it is possible for an investor to systematically “beat the market” (Tobin, 1984).

The weak form of efficient markets theory holds that knowing past asset prices will not enable an investor to follow a profitable trading rule. The semi-strong form holds that no publicly available information will enable an investor to beat the market, because all public information will have been already taken into account.

According to the strong form of efficient markets theory, even privately held “inside information” is fully reflected in asset prices as a result of attempts by insiders to act on the private information they possess. Even strong critics of efficient markets theory as a basis for understanding the financial system often accept the weak form, while even vehement defenders of the general spirit of efficient markets theory usually concede that the strong form of the theory goes too far (see Malkiel, 2003; Shiller, 2003).

Louis Bachelier, in his 1900 Paris doctoral dissertation in mathematics on the theory of speculation (translated in Cootner, 1964), argued that, if investors use all available information and take all profit opportunities, asset prices will follow a random walk in discrete time, with the current price being the best forecast of future price (Dimand and Ben-El-Mechaiekh, 2006; Weatherall, 2013). Bachelier posited that asset price changes are normally distributed, but, as Benoît Mandelbrot was the first to notice, Bachelier concluded as early as 1914 that the tails of distributions of asset price movements were too fat for the distributions to be normal.

In later versions of efficient markets theory, the assumption of a random walk was replaced by the slightly weaker assumption that asset price changes follow a martingale, which does not require successive movements to be probabilistically independent of each other, but retains the property that the current price is the best forecast of the next period’s price (LeRoy, 1989). In the wake of the stock market crash of 1929, Cowles (1933) presented evidence that stock market forecasters failed to predict stock price movements, which are random – although he later accepted that at least one forecasting service had consistently done better than could be explained by chance (Dimand, 2009). Following Bachelier and Cowles, later efficient markets theorists held that investors are rational when pricing assets (so that asset prices fluctuate randomly, without serial correlation between changes) and irrational when paying for stock market forecasts (predictions of the unpredictable), so that investors would be best off to just invest through index funds and avoid the costs of active management of portfolios (Cootner, 1964; Fama 1970, 1991).

Critics of efficient markets theory present evidence of serial correlation in asset price movements, indicating the possibility of bubbles and of predictable price movements (Lo and MacKinlay, 1999). Behavioural finance, which views the actions of investors as guided by conventions, rules of thumb and heuristic biases, has emerged as an alternative to the rationality assumed in efficient markets theory (Shleifer 2000; Shiller, 2000, 2003). From the 1960s onward, Mandelbrot has emphasized fat-tailed distributions of asset price movements, with much greater likelihood of large movements than would be consistent with normal (Gaussian distributions), and even with infinite variance (see Mandelbrot and Hudson, 2004). Shiller (2000) finds that asset prices fluctuate much

more than can be explained by changes in underlying fundamentals. Drawing on the distinction made by John Maynard Keynes and Frank Knight between insurable risk and uninsurable uncertainty, Davidson (1991) views the underlying stochastic processes as non-ergodic; that is, as subject to unpredictable structural breaks. Taleb (2010) uses the term “black swan” for events not even considered among the possibilities when expectations were formed.

Fat tails, excess volatility, fundamental uncertainty and non-ergodicity, and black swans are all ways of expressing the basic insight that knowledge of the future is limited, and mathematical models of rational choice in efficient markets cannot tame uncertainty, or reduce it to insurable risk with a known, tractable probability distribution – which, ironically, marks a return to the original argument of Bachelier and Cowles that it is impossible to predict how asset prices will change, and to efficient markets arguments that an investor cannot make predictions that will beat the market just by knowing past asset prices.

In October 2013, Eugene Fama, who stated and named the efficient markets hypothesis, and Robert Shiller, its leading critic, shared the “Royal Bank of Sweden Prize in Economic Science in Memory of Alfred Nobel” with Lars Peter Hansen, who developed a statistical technique for evaluating such theories about asset price movements.

ROBERT W. DIMAND

See also:

Asset price inflation; Bubble; Credit bubble; Financial crisis.

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Endogenous money

Endogenous money constitutes the cornerstone of post-Keynesian monetary theory, which underlines that the supply of money is determined by the demand for means of payment. An effective presentation of this theory has been proposed by Moore (1988), who differentiates between horizontalists and verticalists. The mainstream theory reflects the verticalist view and states that the money supply function is exogenous, independent from money demand and controlled by the central bank. By contrast, according to endogenous money theory, which reflects the horizontalist view, the supply of money is demand determined, and the central bank can only control the rate of interest, not the quantity of money.

The origin of the modern version of endogenous money theory can be traced back to Joan Robinson (1956) and Nicholas Kaldor (1970). Kaldor intended the endogenous money theory to be an instrument to resist the spread of Friedman's monetarist counter-revolution. Friedman set out to reaffirm the validity of the quantity theory of money and identified an empirical criterion, namely the analysis of the relation between quantity of money and nominal income, in order to falsify Keynesian or monetarist theories. The presence of a direct relation between these two variables would have been consistent with the quantity theory of money and would have falsified Keynesian theories. The empirical evidence gathered by Friedman showed the existence, for a period of over 100 years in the United States and United Kingdom, of a strong relation between the quantity of money and nominal income. Kaldor replied to Friedman that in a world in which credit money is used, the causal relation between quantity of money and income goes in the opposite direction to that maintained by monetarists (see Bertocco, 2001, 2010).

There are different approaches to endogenous money that can be described by using two different classification criteria. One distinguishes between the evolutionary and the revolutionary views (see Rochon and Rossi, 2013). The evolutionary view states that endogenous money theory is characterized by the explicit consideration of the evolution of banking. Chick (1986) specifies different stages in the evolution of banking: in the early stages banks are no more than intermediaries that lend what they receive from savers. In the later stages when deposits become means of payment and the central bank has "fully accepted responsibility for the stability of the financial system" (Chick, 1986, p. 115), banks lend money that they themselves create. The revolutionary view states that money has always been endogenous irrespective of central bank behaviour and the stage of development of the banking sector, because "money has always been responding to the needs of markets for a means of final payment" (Rochon and Rossi, 2013, p. 216).

The second criterion makes a distinction between the horizontalist and the structuralist approaches. The differences between these views concern two points, namely the slope of the credit supply curve and the relevance of liquidity preference theory. The horizontalist approach assumes that the credit supply curve is perfectly elastic with respect to the rate of interest set by banks, while the structuralist view maintains that because of the non-accommodating behaviour of either the monetary authority or banks, the supply of credit is an increasing function of the interest rate. With regard to the second point, structuralists accuse horizontalists of having neglected liquidity preference theory (see Dow, 1997). It can be shown (see Bertocco, 2010) that if two distinct

markets are specified – the interbank market and the credit market – the presence of a perfectly elastic bank-credit supply curve does not imply the abandonment of liquidity preference theory.

Since the beginning of the 1990s, a particular version of endogenous money theory was accepted by mainstream economists and by central bankers who abandoned the control of monetary aggregates and instead targeted short-term interest rates. This version derives from Wicksell's analysis of a pure credit economy. Wicksell (1898 [1969], p. 76) observes that in a pure credit economy in which only bank money is used, "[h]owever much 'money' is demanded in the banks, they can pay it out [. . .] since they do nothing about it, but enter a few figures in their books [. . .]. Supply and demand of money have in short now become one and the same thing." This approach assumes that a natural rate of interest exists, and reiterates the pre-Keynesian principle of money neutrality (see Smithin, 2013). In contrast to this view, the endogenous money theory characterizing the post-Keynesian approach is a basic element to elaborate a "monetary theory of production" that explains the non-neutrality of money. Indeed, this theory allows us to explain: (i) the principle of effective demand and the causal relationship between investment and saving decisions; (ii) the relationship between saving and wealth; and (iii) the monetary nature of uncertainty (see Bertocco, 2013a, 2013b).

GIANCARLO BERTOCCO

See also:

Bank deposits; Banking and Currency Schools; Bank money; Interdependence of money demand and supply; Monetarism; Monetary circuit; Monetary theory of distribution; Money and credit; Money creation; Money creation and economic growth; Money neutrality; Money supply; Natural rate of interest; Quantity theory of money; Wicksell, Knut.

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Euro-area crisis

The euro-area crisis burst at the end of 2009, when the newly elected Greek government discovered and announced that the Greek public deficit and debt were much higher, with respect to GDP, than the previous government had claimed. During 2010 a number of euro-area countries in the periphery of that area (Ireland, Portugal and Spain) came under much pressure, because financial markets participants feared that these countries' governments in one way or another were going to default and exit euroland. These pressures then extended to Italy as well, in light of its high public debt-to-GDP ratio and a rate of GDP growth close to zero. All these countries have thus been subsumed under the acronym "PIIGS" (formed by their initials), to convey the idea that their financial problems originate in their behaviour, characterized by a profligate fiscal policy and expenditure levels beyond available income.

The euro-area crisis is indeed considered to be a "sovereign debt" crisis, which, if it were the case, would mean that it is a crisis generated because of excessive public deficits and debts in a number of its member countries. In fact, apart from Greece, this view is wrong as regards the situation of the general government sector. As a matter of fact, in Ireland and Spain the situation of the public sector was not problematic (according to the famous Maastricht criteria about public finance) until the real-estate bubble burst in 2008. Owing to the increased fragility of many banks and non-bank financial institutions in these countries as a result of the bursting of the housing bubble, the general government sector had indeed to intervene in their support, and in order to avoid a banking crisis whose systemic effects would have devastated the whole domestic economy.

The problematic situation of the "PIIGS" raised dramatically the spreads between the rates of interest on their governments' bonds and the yield of German government bonds, used as a benchmark to assess the quality of public sector borrowers. This upward pressure on these spreads further aggravated the situation in the countries concerned, thereby worsening the euro-area crisis and raising more doubts about the viability of the single currency area. The European Central Bank (ECB) had therefore to intervene on several occasions, first with its decision to reduce policy rates of interest in an attempt to reduce the spreads and to increase confidence on the interbank market, then with a series of unprecedented purchases of bonds on the secondary market for "sovereign debts". Known as the "Securities Markets Programme" (SMP), this intervention by the ECB occurred in public and private debt securities markets within the euro area, to restore their liquidity in order for the ECB monetary policy to work smoothly throughout that area. This intervention has been sterilized by the ECB, in order to avoid increasing the volume of bank deposits with euro-area banks, which in the ECB's view would have exerted an upward pressure on expected inflation rates, thereby putting its price stability goal at stake.

In light of the insufficient effects of the SMP, the ECB decided to implement Longer-Term Refinancing Operations (LTROs), through open-market operations whose maturity exceeds three months and has actually been extended to three years. LTROs were carried out for a total amount of approximately 1 trillion euros, between December 2011 and February 2012. These LTROs represent a form of credit easing (since the credit standards adopted by the ECB were edulcorated and the list of eligible assets included a number of "junk bonds") and have been assimilated to quantitative easing (QE) carried

out by the Federal Reserve in the United States from 2008 in three different steps (named QE1, QE2 and QE3). As the LTROs of the ECB were unable to induce banks to support economic growth via their lines of credit to non-bank agents (who refrained from entering into debt in light of the recession that has been hitting the euro area since the eruption of the crisis), the ECB decided to show its “bazooka” to financial markets in the summer of 2012: its President announced that, within its mandate, “the ECB is ready to do whatever it takes to preserve the euro” (Draghi, 2012a), a promise that he put into practice on 6 September 2012 when he said that the ECB had decided about “undertaking Outright Monetary Transactions (OMTs) in secondary markets for sovereign bonds in the euro area” (Draghi, 2012b). With this new tool, the ECB stands ready to buy an unlimited amount of “sovereign bonds” with a maturity of one to three years, hoping thereby to influence the shorter part of the yield curve (European Central Bank, 2012). OMTs replace the SMP, which is thereby terminated, and are to be sterilized, to avoid putting upward pressure on (expected) inflation rates.

On the whole, the euro-area crisis shows that a single monetary policy for a structurally and economically different series of countries does not work properly, as its supposed “one size fits all” is but a figment of the central bankers’ imagination. The euro-area crisis shows, as a matter of fact, that the ECB cannot make sure that its monetary policy affects the whole area in such a way as to guarantee financial stability and to contribute to economic growth in an environment of stable prices on any kinds of markets (including real and financial assets). It also shows that central bank independence should not be considered as being incompatible with supporting the fiscal policy of the general government sector. In fact, monetary policy is part and parcel of the set of economic policies that should be coordinated and aimed at a series of policy goals that contribute to enhance the prosperity and well-being of all stakeholders.

SERGIO ROSSI

See also:

Bank deposits; Central bank independence; European Central Bank; European monetary union; Financial crisis; Financial instability; Housing bubble; Long-term refinancing operations; Open-market operations; Outright Monetary Transactions; Quantitative easing; Sterilization; Yield curve.

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European Central Bank

The European Central Bank (ECB) was designed to be the monetary policy bridge from which the euro – the leading symbol of European unity and supposed guarantor of just that – is controlled. The ECB and the European System of Central Banks (ESCB)

were established in Frankfurt am Main, Germany, in June 1998 in accordance with the “Maastricht Treaty” on European Union (EU). The ESCB comprises the newly founded ECB and the pre-existing national central banks (NCBs) of all EU member countries (currently 27). The subset of EU member countries that have actually adopted Europe’s “single” currency (currently 18) together with the ECB form the Eurosystem, which is governed by the decision-making bodies of the ECB.

While still young, the ECB is a peculiar central bank both by its statutory set-up and actual policy practices. Modelled after the Deutsche Bundesbank, the ECB has tried hard to emulate the “stability-oriented” policy approach and successes of its German archetype and original inspiration – which itself became part of the Eurosystem with the euro changeover and is supposedly subservient to its new European master today. Accordingly, its mind-set and policy approach features a peculiar asymmetry: the ECB is quick to hike in view of perceived inflation risks but reluctant to ease in support of the economy.

The ECB’s multi-faceted peculiarity shone through strongly in energetic efforts to distance itself from the anything-but-impressive economic performance of the area under its monetary reign even in the largely smooth-sailing pre-crisis period. Thoroughly misreading the signs of the oncoming perfect storm until running the ship aground, the ongoing crisis savaging the euro area since 2010 has forced the ECB to depart from its stability-oriented rulebook and improvise along more venturous lines. As if chased by a curse, with the euro’s future hanging in serious doubt, stepping outside the Bundesbank’s towering shadow with the declared intention of saving its entrusted currency has brought the ECB into direct conflict with its very model.

The ECB’s decision-making bodies are the Governing Council (GC) and the Executive Board (EB). The former is the principal policy-making body, which meets twice a month, while the latter is responsible for day-to-day policy execution. The GC includes the presidents of the euro member countries’ NCBs and the six EB members: that is, the ECB president, a vice-president, and four other members, all selected by the euro member countries’ heads of state or government. As all GC members are voting members, the policy-making body is very large. Also, following the one-person, one-vote principle, NCB representatives from across the monetary union enjoy an over-strong position *vis-à-vis* the Frankfurt-based EB. However, all GC members share a common mandate focused on the euro area aggregate situation.

By its statutes and constitutional position, the ECB is probably the most independent central bank in the world (Bibow, 2006). Any instructions from national or supranational political bodies are strictly banned. The ECB is not held to account on its performance by any political authority. Transparency about its policy conduct includes numerous publications, press conferences, presentation of its annual report to the European Parliament, and quarterly meetings with a subcommittee of the European Parliament, but little is revealed about internal policy debates and decision making (Buiter, 1999). As changing the ECB’s statutory position would require unanimity among euro-area member states, the ECB is legally in an unchallengeable position. To make the euro as “hard” as the *Deutschmark*, if not harder, the ECB was designed to be super-strong.

By its statutes the ECB’s tasks were largely confined to the monetary policy domain of central banking. In the financial stability domain, the ECB’s role as “bankers’ bank” remained largely undefined. For fear of fiscal dominance, the other traditional central

bank role as “government banker” was very tightly constrained. In particular, any loans to governments, including purchases of government securities in primary markets, are strictly prohibited. Additional fiscal safeguards (as the Stability and Growth Pact) were put in place to protect the currency and its guardian from government abuse and fiscal profligacy. Governments are also highly constrained regarding euro exchange-rate policy, which historically presented the Bundesbank’s soft flank.

At the core of the ECB’s monetary policy is setting a target for euro overnight money market rates of interest and making the policy rate of interest effective in the market through operating procedures that feature an interest-rate corridor (set by marginal lending and deposit facilities) and the use of open market (repurchase) operations with a large circle of banking counterparties applied to manage liquidity conditions in the interbank market.

While the euro area’s pre-crisis performance was unimpressive overall, the ECB’s most consequential policy blunder relates to thoroughly misjudging persistent divergences and the related build-up of grave imbalances inside the monetary union. As Germany lastingly undershot the 2 per cent stability norm, which should anchor unit labour cost trends in the monetary union, intra-area competitiveness positions ran seriously out of kilter. Also, the ECB’s “one size fits all” policy stance became too tight for Germany but too easy for other member countries. As protracted domestic demand stagnation made Germany “the sick man of the euro”, bubbles built up elsewhere. Regional bubbles burst and imbalances started to unravel with the outbreak of the global financial crisis of 2008–09.

The ECB has been challenged to the utmost in dealing with the consequences of the euro shipwreck, which the bank contributed to by its own misguided and negligent policies. The ECB has proved uncharacteristically flexible in meeting the liquidity needs of the euro-area banking systems. In the fall of 2012, Mario Draghi famously promised conditional liquidity support for government bond markets through “Outright Monetary Transactions”. ECB crisis management has enabled German banks to sharply cut back their exposures to euro-area crisis countries (migrating onto the Bundesbank’s balance sheet in the form of TARGET2 imbalances as a result). But the Bundesbank has openly opposed the ECB’s euro-area crisis management.

The ECB may be legally unchallengeable but its protection falls well short of the “untouchable” status that the Bundesbank derives from public backing in Germany. With public opinion in the euro area’s key creditor country being vital for any fiscal support for the euro, the euro’s fate remains highly uncertain – as the ECB emperor may be exposed to have no clothes (Bibow, 2013).

JÖRG BIBOW

See also:

Bubble; Central bank independence; Corridor and floor systems; Deutsche Bundesbank; Draghi, Mario; Euro-area crisis; European monetary union; Financial crisis; Open-market operations; Outright Monetary Transactions; TARGET2 system.

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European monetary union

The Treaty of Rome (1957) implementing the European Economic Community (EEC) did not provide for specific provisions to monitor the exchange rates of its member countries' currencies. Only from the mid 1960s did European political leaders, confronted with the collapse of the international monetary system, consider ways to protect the EEC from the harm caused by growing exchange-rate instability. This led to the Werner Report of 1970, which proposed economic and monetary union over the next decade – a proposal that never materialized. As such, European authorities fell back on specific mechanisms to promote a (relative) stability of foreign exchange rates, notably via the European Monetary System (EMS), which operated from 1978 to 1998.

The idea of establishing a monetary union in Europe resurfaced in the late 1980s, in the context of revitalizing the European construction. In 1988, an *ad hoc* committee chaired by Jacques Delors, then President of the European Commission, was set up in order to propose steps for creating an economic and monetary union. The ensuing report laid the foundations of such a union, resulting in the adoption of the Maastricht Treaty of 1992. The main provision of this Treaty, which took effect on 1 January 1999, was to implement a single currency in Europe. However, not all member countries of the European Union (EU) adopted the euro, as the Maastricht Treaty provided convergence criteria that needed to be met before countries were allowed to join, and an opt-out (opt-in) clause for Denmark and the United Kingdom. Currently (June 2014), 18 member countries out of 28 have adopted the euro as their single currency.

Further, with the establishment of the single currency, the Maastricht Treaty promoted the establishment of a European Central Bank (ECB), whose responsibility includes the conduct of monetary policy across the whole euro area and price stability (an inflation rate below, but close to, 2 per cent over the medium term). To complement and strengthen the effects of the single monetary policy, a Stability and Growth Pact was established in 1997, designed to safeguard sound public finances.

Prior to the Maastricht Treaty, various assessments of the potential costs and benefits of forming an economic and monetary union in Europe were carried out. In particular, the Commission of the European Communities (1990) insisted on the efficiency gains and their positive impact on economic growth that would result from the elimination of exchange-rate uncertainty and transactions costs. It also insisted on the economic benefits that would result from price stability. It acknowledged that the loss of monetary and exchange-rate policies as instruments of economic adjustment at the national level would represent a major cost. However, it argued that this cost should not be exaggerated, since the exchange rate of the European single currency against foreign currencies could fluctuate, and since most of the EU member countries within the EMS had already abandoned the exchange rate instrument. Finally, by becoming a major international currency, the European currency would allow banks and firms to conduct international business in their own currency, and member States would spare external reserves and speak with a single voice in the field of international monetary and financial affairs.

Despite this vision, the implementation of the European single currency (the euro) did not prevent the EU from stagnating. In fact, in 2002, the European Commission asked a panel of distinguished economists to examine the ways and means of making the EU economic system deliver. The ensuing report (Sapir et al., 2003) did not incriminate the euro itself, but laid the blame for the unsatisfactory economic growth of the EU on its failure to become an innovation-based economy. The report recommended a drastic change in economic policies in order to face this situation.

It should also be mentioned that another expected outcome of the European monetary union was the improvement of political cohesion among its member States. Needless to say, this is also far from being a success at the time of writing.

With the benefit of hindsight, we may now note that the way monetary union has been implemented in Europe bears significant responsibility for economic stagnation and unemployment across the euro area. From the beginning, it was plain that the economic systems of its member countries were too heterogeneous to support fixed exchange rates and a one-size-fits-all monetary policy. Referring to Mundell (1961), many economists rightly argued that the euro area was not an “optimum currency area”. The convergence criteria dealt mainly with nominal variables only (stability in price levels, interest rates and foreign exchange rates), not with structural features such as disparate wage and social security levels.

All in all, the realization of European monetary union was done in a nonsensical way. For instance, its member countries were invited to abandon their monetary sovereignty, yet they are still not members of a single payment system. This is because their national currencies were not replaced with a truly single European currency, despite the changes in the currencies’ names: the European system of cross-border payments (TARGET2), in fact, does not allow for the settlement of payments, as was made obvious by Germany’s accumulation of TARGET2 balances in the aftermath of the euro-area crisis that erupted in 2009. In a truly unified currency area, as in any country with its own domestic currency, all payments would be settled through the central bank. This is not what occurs in the euro area as regards TARGET2 payments with respect to the ECB. In light of the persistent heterogeneity of its member countries’ economies, the EU should take advantage of its uncompleted monetary union to use the euro as a common currency for international payments, both within and outside the euro area, and restore its member countries’ sovereignty with regard to the exchange rates of their still domestic currencies and to their monetary policies. The ECB would act thereby as an international clearing house built on the model of the International Clearing Union once designed by Keynes (see Rossi, 2012).

CLAUDE GNOS

See also:

Bretton Woods regime; Euro-area crisis; European Central Bank; International settlement institution; Optimum currency area; TARGET2 system.

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Exchange-rate interventions

Exchange-rate interventions, also referred to as foreign exchange (forex) interventions, are operations by the central bank performed in the foreign currency market(s) with the aim of affecting (or “managing”) the exchange rate of the national currency. By definition, such transactions consist in purchases or sales of assets denominated in foreign currency and are undertaken continuously under fixed (or pegged) exchange-rate regimes to maintain the peg at the announced level. Yet forex interventions may also frequently occur under flexible (or floating) exchange-rate arrangements, to smooth out potentially abrupt exchange-rate adjustment especially when forex volatility is higher than usual.

To understand better the mechanism of forex interventions, it is instructive to look at an aggregate (and simplified) version of a standard balance sheet for a (hypothetical) central bank (Table 4). As for other corporations, the balance sheet records the assets and liabilities (plus capital) of a central bank at a given point in time. The assets include the central bank’s portfolio of monetary gold and Special Drawing Rights (SDRs) at the International Monetary Fund (IMF) (item A1 in Table 4), foreign assets (A2) and domestic credit (A3). The central bank’s liabilities include the currency in circulation outside banks (L1), the reserves held by all other banks on accounts with the central bank or as cash in their vaults (L2) and, by convention, the capital of the central bank, or its net worth (L3). The monetary gold and the liquid part of foreign assets comprise the gross international (or official) reserves the central bank can use for the purpose of forex interventions, sales or purchases. The domestic government bonds can, in turn, be used for the purpose of open market operations, sales or purchases. The loans to domestic banks are also called (bank) refinancing (operations or policy) in Europe, or discount loans (or policy) in the United States. The sum of the currency in circulation and the reserves

Table 4 Simplified balance sheet of a hypothetical central bank, in billions of national currency units at a given of time

Assets		Liabilities	
A1. Monetary gold and SDRs at IMF	5	L1. Currency in circulation	80
A2. Foreign assets	25	L1a. Notes	5
A2a. Foreign governments bounds	15	L1b. Coins	10
A2b. Foreign currency deposits	10	L2. Bank reserves	
A3. Domestic credit	70	L2a. Required minimum	5
A3a. Domestic government bonds	25	L2b. Held in excess	2
A3b. Loans to domestic banking system	45	L2c. Vault cash	3
		L3. Capital	10
Total	100	Total	100

Source: Author’s elaboration.

of banks forms the monetary base, also known as the M0 monetary aggregate or high-powered (or central-bank) money.

One can see the difference between non-sterilized and sterilized forex interventions by comparing their respective effect on the balance sheet of the central bank (Krugman et al., 2012, pp.493–533). Abstracting from valuation adjustments (whose effects would not be large for a shorter time lapse), and assuming that the net worth of the central bank stays constant (which, indeed, is a realistic hypothesis), then any change in the assets side between two dates should be matched by a corresponding change in the liabilities side. A purchase of any asset by the central bank has to be paid for with currency or a check from the central bank, both of which are denominated in domestic currency, thus increasing the supply of money in circulation. A sale of any asset by the central bank will have to be paid for with currency or a check given to the central bank, both of which are denominated in domestic currency. The central bank retains the currency into its vault or reduces the amount of bank reserves by the amount of the check, hence causing the supply of money in circulation to shrink.

Central banks trade foreign government bonds and foreign currency deposits, which are substitutes to a high degree as both are very liquid assets denominated in foreign currency, in the foreign exchange markets. Quantities of both foreign currency deposits and foreign government bonds that are bought and sold influence the exchange rate. Because buying and selling of foreign bonds or foreign currency on deposits in the foreign exchange market affects the domestic money supply, a central bank may want to offset this effect. This offsetting effect is called sterilization, or a sterilized (forex) intervention. For example, if the central bank sells foreign bonds in the foreign exchange market (say, –1 billion units of national currency recorded in item A2a), it can buy domestic government bonds in bond markets in the same amount (recorded as +1 billion units of national currency in item A3a) so as to leave the amount of money in circulation unchanged.

As Sarno and Taylor (2002, pp.208–44) argue, the rationale for engaging in official exchange-rate interventions can be explained by four main arguments: (i) the wrong-rate argument under float states that an inefficient forex market may tend to generate the “wrong” exchange rate, which implies *ex-ante* abnormal returns, rather than the “correct” rate, defined as corresponding to economic fundamentals; (ii) the information-set-mismatch argument maintains that some information used by market participants may be inaccurate or misleading in comparison to the information set of the authorities; (iii) the argument of offsetting temporary disturbances applies to cases of exchange rate overshooting or cross-country policy interdependence; and (iv) the adjustment-smoothing argument invokes smoothing the adjustment process of exchange rates from short-run values to long-run values.

According to their types, forex interventions are usually distinguished in terms of: (i) non-sterilized versus sterilized ones; (ii) public (announced) versus secret ones; and (iii) internationally coordinated (concerted) versus non-coordinated ones.

A strong consensus exists that non-sterilized forex intervention acts like monetary expansion or contraction, and that it is rather effective in inducing changes in the monetary base, hence in the broader monetary aggregates and interest rates, and ultimately in market expectations and the exchange rate. The effectiveness of sterilized interventions is, by contrast, controversial and the empirical evidence is mixed. Their effect may arise if private agents change their exchange-rate expectations because they change their view

either of the likely future actions of the central bank or of the impact of certain actions of the central bank.

Research on forex interventions has been focused on developed economies and has been impaired by data secrecy – at the relevant intraday frequencies, in particular – and by the resulting indirect approaches to uncover their key effects, themselves differing for various exchange rate pairs and horizons. Correcting for such deficiencies in the data coverage and availability and in the related econometric methodologies has recently revealed the influences of intervention timings and information spillovers (see Dominguez, 2003, for G3 currency pairs) or the differences typical for emerging market economies (Menkhoff, 2013) and has produced more than twice stronger (see Chen et al., 2012, for the US dollar–yen rate) or asymmetric (see Fatum et al., 2013, for the Danish krone–euro rate) effects of interventions. Further criticisms to this literature have argued that the central bank may intervene to exert an impact on the exchange rate but with a number of drawbacks, such as inflating a real-estate bubble and/or increasing financial instability. Moreover, as was the case of the Bank of England in the pre-crisis period of the European Exchange Rate Mechanism (early 1990s), forex interventions may do little to fix the underlying problems related to the business cycle, the economic structure, policy coordination, and/or market expectations.

ALEXANDER MIHAILOV

See also:

Cash; Central bank money; Financial instability; High-powered money; Housing bubble; International Monetary Fund; International reserves; Monetary aggregates; Open-market operations; Sterilization.

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Exchange-rate pass-through

Policy makers define exchange-rate regimes in agreement with monetary policy. As Vernengo and Rochon (2000, p. 77) point out, “preferences over a specific exchange rate regime can be linked to macroeconomic policy, in particular to whether economists prefer full-employment policies or whether they defend policies aimed at guaranteeing price stability”. As several countries are adopting flexible exchange rates to prevent chronic deficits in their balance of payment (many countries were forced by speculative attacks on their national currencies to abandon fixed exchange-rate regimes),

understanding the pass-through effect – the effect of exchange-rate fluctuations on the rate of inflation – became crucial as well as controversial. Many central bankers, adopting mainstream recipes, are targeting inflation in order to avoid the pass-through effect, considering that exchange-rate devaluations have had substantial impacts on domestic prices. In many cases, policy makers have focused primarily on price stability, leaving aside full-employment policies.

Mainstream models rely on assumptions that market imperfections lessen the exchange rate pass-through effect. In general, these theoretical models assume that when an exogenous change in the exchange rate occurs, domestic firms will only partially pass its costs to final prices, so that either the prices are sticky in domestic currency in the short run or firms are engaged in price discrimination. Krugman (1987) refers to the second case as “pricing to market”, as firms do not change domestic prices automatically, but only proportionally to the firm’s elasticity of demand.

Post-Keynesian price theory emphasizes that mainstream models of exchange-rate pass-through are inappropriate. According to Arestis and Milberg (1993–94), particular theories of the firm define the differences between post-Keynesian and neoclassical theories of the exchange-rate pass-through. The post-Keynesian firm is an oligopolist with a specific internal structure and set of investment requirements, based on its long-run objective of survival and growth. This firm is fundamentally different from the profit-maximizing behaviour of the neoclassical firm, which is characterized by short-run goals.

Post-Keynesian theories of pricing in manufacturing industries are based on the full-cost principle, in which a limited exchange-rate pass-through is a result of market imperfections. In Kalecki’s (1971) framework, a rise in costs for domestic or foreign firms due to a new level of the exchange rate is not fully transmitted to prices because of the degree of monopoly. In Eichner’s (1976) model, a change in the exchange rate also affects the cost of raising funds internally for future investments. As a result, the firm’s investment plans are altered, its markup is reduced, and the exchange rate is passed through only to a limited degree.

In other words, whereas neoclassical models imply that partial exchange-rate pass-through reflects market imperfections, the post-Keynesian approach implies that partial exchange-rate pass-through should be the norm, and there is no reason why a full or one-to-one exchange-rate pass-through should be observed in the real world. In neoclassical models, one possible explanation for recent lower exchange-rate pass-through levels would be that markets are now less integrated than before.

Taylor (2000) suggests an alternative explanation within the neoclassical approach for the decline of exchange-rate pass-through in a lower inflationary environment. For him, lower exchange-rate pass-through results mainly because the pricing power of firms declines as well; that is, globalization has intensified the degree of competition of domestic firms. Therefore, under this hypothesis it might be possible, especially for emerging market countries, to experience a transitions period, from high and unstable inflation environments to low and stable ones, during which the full benefits of a floating exchange-rate regime might not be observed. However, once inflation rates stabilize at a low level, the exchange-rate pass-through weakens and movements of the exchange rate put less pressure on inflation, allowing the economy to fully benefit from exchange-rate flexibility.

Baqueteiro et al. (2003) also point out that the level of the exchange-rate pass-through

depends on the inflation environment. For a group of small open economies that in recent years have experienced disinflation processes, the level of the exchange-rate pass-through weakened as the rate of inflation fell. This result suggests that when a low and stable inflation environment is achieved, agents' expectations are likely to be in line with the authorities' inflation target and thus to be less influenced by short-term exchange-rate variations. Under such circumstances it is difficult to understand why the "fear of floating" phenomenon should persist. Credibility in monetary policy as well as competitive markets should lead to free floating and reduced exchange-rate pass-through effects. However, "fear of floating" is pervasive (Calvo and Reinhart, 2002).

In other words, according to conventional wisdom, partial exchange-rate pass-through results from imperfections and sluggish price adjustment, which seems contradictory in a more integrated world, or in a more competitive environment associated with globalization, leading to the logical result that central banks should let the exchange rate float, which is not a feature of the real world.

From a theoretical point of view, it would seem that post-Keynesian models would provide a sounder basis for analysis. The hypothesis that globalization has reduced the degree of monopoly of domestic firms is perfectly compatible with the full-cost principle. However, post-Keynesians do not argue that once lower exchange-rate pass-through effects are established, price stability would depend on the credibility of the central bank. Hence, the "fear of floating" phenomenon is not associated with a lack of credibility, and is not a puzzling result. In a post-Keynesian framework, "fear of floating" would result from the central bankers' "fear of inflation". In a contested terrain view of central banking – one in which monetary policy affects income distribution – the central bank attaches considerably more importance to inflation than to unemployment in policy decisions. In that case, even when exchange-rate pass-through effects fall considerably, central banks attach greater importance to any inflationary shock, no matter how small.

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See also:

Central bank credibility; Credibility and reputation; Fear of floating; Inflation targeting; Interest rate pass-through; Monetary policy and income distribution; Monetary policy in a small open economy.

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Exchange-rate targeting

Orthodox economics considers the exchange rate as a nominal anchor against inflation to provide long-run macroeconomic stability (Snowdon et al., 1994). Along with this general position, after the breakdown of the Bretton Woods exchange-rate pegs, it was suggested that a target zone for the exchange rate would benefit from some flexibility and its maintenance would be less demanding than a strict peg (Williamson, 1985; Krugman, 1991).

By contrast, policy makers, especially in developing countries, tend to be more concerned with real variables, short-term dynamics and real exchange-rate targeting. In this respect, Chile was one of the first countries to adopt, in 1965, an exchange-rate rule based on purchasing-power parity (PPP), followed by Brazil in 1968. This rule determined the nominal exchange rate that was changed at irregular intervals depending on the inflation-rate differential between Brazil and the United States (Calvo et al., 1995).

Analytically, stabilizing the real exchange rate means targeting the product of the nominal exchange rate and the ratio of foreign prices to domestic prices:

$$S_R = S_N \frac{P_f}{P_d}$$

where S_N is the nominal exchange rate, defined as domestic currency units per unit of foreign currency; P_f is the general price level of the foreign economy; P_d is the general price level of the domestic economy; and S_R is the real exchange rate, defined here so that an increase of the index represents an exchange-rate depreciation in real terms. The periodical manipulation of S_N allows the maintenance of the real exchange rate around its target.

In the 1990s, the consensus monetary policy migrated towards inflation targeting, which assumes flexible exchange rates, dismissing intermediate exchange-rate arrangements (Fisher, 2001; Frankel et al., 2001). However, policy makers still face the problem of mixing inflation and exchange-rate objectives, as in practice not many countries adopt a pure free-floating regime.

This policy dilemma inspired a series of orthodox studies on the trade-off between inflation and exchange-rate targeting: on the one hand, an undervaluation of the exchange rate improves the current account but, on the other hand, it has undesired effects on inflation and output, leading to permanent higher inflation (Montiel and Ostry, 1992; Calvo et al., 1995). However, these models fail to consider the dynamics of the real variables within the economy such as the structural adjustment in terms of sectoral breakdown of the economy as a result of an undervaluation of the exchange rate.

The critique to these orthodox models is particularly important for small economies dependent on the export of one or few primary commodities: with a free-floating exchange rate, typical of inflation targeting regimes, a nominal exchange rate is procyclical because it comoves with the price of the exported commodities, emphasizing the volatility of the business cycle and inhibiting the diversification of the economy away from primary commodities (Nissanke, 1993).

With the dynamics typical of small developing economies in mind, Edwards (1986)

offered a definition of the exchange-rate alternative to the one provided above, where the real exchange rate is expressed as the price of traded goods in terms of non-traded goods:

$$S_R = S_N \frac{P_{Tf}}{P_N}$$

where P_{Tf} is the price of tradeables in the foreign economy and P_N is the price of non-tradeables in the local economy.

Finally, the benefits of a countercyclical exchange-rate policy are part of a research agenda in the structuralist tradition: Frenkel and Taylor (2009) argued that the exchange rate can serve multiple objectives for developing and transition economies through different channels. First, through the macroeconomic channel, it influences resource allocation and aggregate demand via its effects on imports, exports, tradeables and non-tradeable prices. Thus, a relatively weak exchange rate can boost employment. Second, through the labour intensity channel, it influences real wages in terms of foreign currency, which, in turn, have an impact on production. Finally, through the finance channel, since a fraction of firms' debt may be in foreign currency while their income and assets may be mostly in domestic currency, the exchange rate can influence balance sheets' currency mismatches.

In conclusion, the exchange-rate target is considered a developmental tool in conjunction with commercial and industrial policies.

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See also:

Bretton Woods regime; Inflation targeting; Monetary policy in a small open economy.

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F

Fear of floating

The term “fear of floating” was first used by Calvo and Reinhart (2002). It refers to the fact that a country, having officially set a floating exchange-rate regime, uses its monetary policy instruments to smooth the exchange rate of its currency, thus avoiding the problems of high variations of it in the foreign-exchange market. According to the authors, fear of floating has been a widespread phenomenon in the international monetary system since the 1970s, especially in emerging countries.

After the collapse of the Bretton Woods fixed exchange-rate regime, nations had to choose between the option of carrying on with exchange-rate fixity or moving towards a flexible exchange-rate regime. Several financial crises in the 1980s and 1990s spread the idea that soft peg regimes – that is, fixed exchange rates with some degree of variation – were destabilizing for emerging countries, so they had to let their currency float in the foreign-exchange market. International Monetary Fund (IMF) statistics seemed to confirm the implementation of this guideline: few countries remained on a fixed exchange-rate regime, whereas the free-floating option became gradually preferred to that of intermediate regimes.

The work of Calvo and Reinhart (2002) shows that observed practices contradict the apparent official extension of floating exchange-rate regimes. Their empirical research concerns 154 exchange-rate arrangements in 39 countries. For each case, they measure the volatility of certain variables – exchange rates, nominal and real interest rates, foreign-exchange reserves, base money, and commodity prices – by computing the probability that each one falls within pre-established narrow bands on a monthly basis.

The authors came to the following conclusion: first, the volatility of the exchange rate is significantly lower in the studied cases than that of the benchmarks – that is, exchange rates between US dollar, Japanese yen, and German *Deutsche Mark* (now the euro) – even for the self-declared floating exchange-rate regimes. Second, this lower variability of exchange rates can be explained by the need to resort to monetary policy mechanisms – specifically interest-rate changes as well as the use of foreign-exchange reserves – which seem to be more unstable in the analysed floating exchange-rate regimes than in the benchmarks. Therefore, Calvo and Reinhart (2002) confirm the hypothesis that some authors (see Hausmann et al., 2001) had already formulated: most of the *de jure* floating exchange-rate regimes are rather soft pegs.

The lack of credibility in monetary policies appears as a key aspect behind the efforts of smoothing exchange-rate fluctuations in emerging economies. Monetary instability forces authorities to make exchange-rate stabilization an anchor of monetary policy and to limit the role of the interest-rate instrument regarding this anchor. This can lead, however, to interest-rate volatility and pro-cyclical monetary policies. Nevertheless, it is a way for monetary authorities to avoid particular threats for this group of countries that may be caused by exchange-rate volatility.

The primary threat in this respect is associated with the ability for residents to borrow in foreign markets. In case of depreciation/devaluation of the exchange rate of

the domestic currency, capital reversals (capital outflows) or sudden stops (Calvo and Reinhart, 2000a) are more violent in emerging economies than in developed economies, and credit ratings fall more sharply (Calvo and Reinhart, 2000b). Taking into account their weak financial domestic systems, the subsequent tightening in external credit access causes particular contractionary effects in emerging economies. Besides, some emerging markets already have high levels of liability dollarization. Any depreciation of the national currency increases the external debt of these countries to the same extent.

Trade openness is another significant factor that explains intolerance to currency floating. Unlike developed countries, exchange-rate uncertainty in emerging markets is considered by several researchers to have harmful effects on trade relations. Some emerging economies are specialized in exporting dollar-denominated goods. Hence, volatility in exchange rates would cause export-level instability. To that uncertainty one should add the negative consequences from depreciation as well as appreciation of the exchange rate. On the one hand, the latter erodes international competitiveness and increases the risk of Dutch-disease-type dynamics. On the other hand, the exchange-rate pass-through is more evident in emerging markets, so that a government willing to maintain a low and stable inflation rate should be interested in securing the stability of the exchange rate.

The debate about the optimal exchange-rate regime and the differences between official and actual regimes has been growing since the end of the twentieth century. In fact, since 1999, the IMF has been developing a *de facto* regimes listing in contrast to its official-label-based traditional classification (International Monetary Fund, 1999). The fear-of-floating study has provided a major contribution to this discussion, questioning the theoretical advantages of floating exchange-rate regimes, and defending hard pegs – especially dollarization – as a possible “market-friendly” long-term alternative for emerging economies. Since then, several theoretical works (see Fischer, 2001; Eichengreen, 2006) and hard-peg regimes – currency boards, dollarization, and monetary unions – that started in some of both emerging and developed countries in the 1990s have kept this debate open.

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See also:

Bretton Woods regime; Capital flight; Central bank credibility; Currency board; Dollarization; Financial crisis; International Monetary Fund; International reserves; Sudden stops.

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Federal Open Market Committee

The Federal Open Market Committee (FOMC), the main monetary-policy-making body for the United States, has embodied since its creation a shifting balance of political, academic and operational concerns. The Federal Reserve Act of 1913 rested essentially on the so-called real-bills doctrine in its effort to create a sufficiently elastic monetary system for the nation. This vision entailed the creation of a liquid private market in acceptances. After the model of European central banks, the US Federal Reserve (Fed) would provide elasticity to this market through management of the discount rate for acceptances. By 1935, however, the power of the US Federal Reserve branches to affect economic and financial conditions through open-market operations had been proven, and the US Banking Act of that year confirmed the shift with the formal constitution of the FOMC.

After subsequent adjustments, the FOMC consists of the entire seven-member Board of Governors of the Federal Reserve System, along with five of the twelve US Federal Reserve Bank branch presidents. The Governors are appointed by the president to staggered 14-year terms, while the Fed presidents serve on the FOMC under a regional rotation structure (with weight toward New York above all, Chicago and Cleveland jointly second, and the other nine branches third), reflecting a complex political balance between central, regional, and local interests in the US banking system. Though this design suggests the representation of a diversity of views, in practice dissenting votes (though not infrequent) are rarely enough to upset the high level of consensus on the FOMC (Wynne, 2013).

The First World War, prior to the creation of the FOMC, and then the Second, shortly after, immediately eroded the real-bills doctrine, as the Fed was forced to acknowledge its role as government bank in the conduct of war finance (Mehrling, 2010). Thus the emergence of open-market operations as the main instrument of monetary policy went hand-in-hand with a changing understanding of the Fed's proper role. It was finally the 1951 Fed–Treasury Accord that freed the Fed from its wartime obligation to fix the price of US Treasury debt, paving the way for the emergence of a non-wartime monetary policy regime. Meanwhile, the Employment Act of 1946 evolved first into a commitment to full employment, and later to a problematic "dual mandate" to support both employment and price stability (Meltzer, 2009), giving a purpose to that regime.

By the eve of the global financial crisis that erupted in 2008, the framework for FOMC policy-making was organized around the establishment of a target for the overnight interest rate in the interbank market for reserves at the Fed. Open-market operations allowed the management of the supply of reserves in this market, and arbitrage relations among the various short-term funding instruments meant that conditions in money

markets generally could be affected from a small base of high-powered money (Board of Governors of the Federal Reserve System, 2005).

The shift from the discount-window framework imagined at the Fed's creation was profound. In that vision, the Fed discounts, at the initiative of member banks, self-liquidating acceptances (real bills) in support of trade, agriculture and industry. Thus fluctuations in the demand for reserves are met by their provision at the discount window, with the price set at the policy discount rate. This elasticity of reserves supports the elasticity of note issue and credit provision, reducing the seasonal fluctuations that had led to recurrent crisis in the pre-Fed era. In this passive, constrained role the Fed would provide liquidity to securities markets by expanding its balance sheet as needed in response to the demands of the financial system, while the self-liquidating character of acceptable collateral would automatically restore balance once the need had subsided.

In the vision that was to dominate by the early 2000s, the Fed transacts, at its own initiative, to affect the supply of reserves in order to maintain the policy short-term interest rate. Countercyclical adjustments to the price of overnight funds, through one of a number of possible transmission channels, reduce cyclical macroeconomic fluctuations, supporting some balance between the dual objectives of price stability and full employment. This countercyclical role moves initiative to the Fed itself, and involves the central bank's taking liquidity in securities markets in order to adjust the supply of reserves.

The challenges of monetary policy-making during the global financial crisis have made further evolution likely, both to this framework and to its academic foundations. The target for the US federal funds rate of interest reached the nominal zero lower bound in December 2008 (Board of Governors of the Federal Reserve System, 2008). By then the focus of policy-making was already shifting towards the Fed's many special liquidity programmes. These were eventually replaced on the Fed's balance sheet with purchases of mortgage-backed securities in the first phase of so-called quantitative easing (QE). Subsequent rounds of QE were an attempt to prolong monetary accommodation with the US federal funds rate of interest still at zero.

The operational norms for the FOMC have evolved incrementally since the 2008–09 crisis, reflecting the shifts in monetary conditions and in academic debate. In form, much remains unchanged. The policy-making process is organized around eight meetings each year. Inputs to this process come in the form of analyses of economic conditions (the “Beige Book”), projections of future economic conditions (the “Green Book”), and monetary policy alternatives (the “Blue Book”). FOMC meetings are structured around the committee's conversion of these inputs into outputs in the form of a policy directive to the open-market desk at the New York Fed, a public statement, a summary of the committee's economic projections, and, with a lag, the minutes of the meetings themselves.

The post-meeting statement emerged in 1994 as a way to communicate the FOMC's first move to tighten monetary policy after several years of accommodation, and has since grown in importance (Wynne, 2013). Current focus on the FOMC statement is driven by the lack of other policy tools with interest rates at the nominal lower bound, and is supported by an intellectual paradigm, dominant in US academic economics and reflected in the Fed's economics staff, which emphasizes the role of expectations in economic decision-making (Blinder, 2004). In such a paradigm, FOMC communication about the future course of policy, so-called forward guidance, can be a way to affect economic conditions in the present by adjusting today expectations about the future.

Recent developments along these lines include the publication of FOMC members' economic projections, and the acceleration of the release of FOMC meeting minutes, as mechanisms for affecting expectations.

Post-crisis FOMC meetings are dominated by discussion of the timing and pace of the removal of Fed balance-sheet accommodation, and the eventual rise of short-term interest rates above zero. The introduction of interest on reserves, and recent experiments with a reverse repo standing facility, suggest the technical ingredients of a future framework, while the predominance of US dollar-denominated global finance and market-intermediated credit suggest some of the challenges that framework will face. The details are not yet apparent.

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See also:

Collateral; Effective lower bound; Federal Reserve System; Financial crisis; Forward guidance; High-powered money; Monetary policy transmission channels; Open-market operations; Policy rates of interest; Quantitative easing; Real-bills doctrine; Repurchase agreement; Zero interest-rate policy.

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Federal Reserve System

The creation of the US Federal Reserve System was enacted by the Federal Reserve Act on 23 December 1913, as a response to the severe crisis of 1907, “to provide for the establishment of Federal reserve banks, to furnish an elastic currency, to afford means of rediscounting commercial paper, to establish a more effective supervision of banking in the United States, and for other purposes” (Board of Governors of the Federal Reserve System, 2014, Official title). It was the third attempt to create a federal central banking system, after the First Bank of the United States (1791–1811) and the Second Bank of the United States (1816–36) failed.

The US Federal Reserve's duties fall into four general areas: conducting the nation's monetary policy, supervising and regulating banking institutions, maintaining the stability of the financial system and containing systemic risk that may arise in financial markets, and providing financial services to depository institutions, the US government, and foreign official institutions (Board of Governors of the Federal Reserve System, 2005, p. 1).

The federal structure of the US Federal Reserve System aims at reflecting the economic

diversity of the US territory: the System is composed of a central, federal government agency based in Washington, DC; the Board of Governors; and twelve regional Federal Reserve Banks, with twenty-five branches, whose functions include operating a nationwide payments system, distributing the nation's currency and coins, supervising and regulating member banks and bank holding companies, and serving as banker for the US Treasury (*ibid.*, p. 6).

The Board of Governors of the Federal Reserve System has authority over the Federal Reserve Banks and their branches. The seven members of the Board are appointed by the President of the United States and confirmed by the US Senate. However, the Federal Reserve is free from direct influence on monetary policy by the executive branch, and therefore qualifies as an independent central bank.

The 1951 Treasury–Federal Reserve Accord was paramount in establishing the Federal Reserve as independent, through “a lasting separation between monetary policy and the Treasury’s debt management powers” (Moe, 2013, p. 3). However, it is subject to oversight by Congress and as such “[t]he independence of the Federal Reserve System does not mean independence from the Government but independence within the Government” (Joint Committee on the Economic Report, 1952, quoted in Moe, 2013, p. 65). The Accord did not entail entire insulation of monetary policy from the Federal government, since it was held that “fiscal and monetary policy must be coordinated with each other and with the other policies and objectives of the Government” (Report of the Subcommittee on General Credit Control and Debt Management, 1952, quoted in Moe, 2013, p. 65). The necessity for such coordination has been revived in the aftermath of the 2008–09 global financial crisis (Federal Reserve and Treasury Department, 2009). Criticism has been levelled against the US Federal Reserve governance as insufficient to guarantee democratic accountability and, therefore, in need of structural reform so as to better serve public interest (see for example Schlesinger, 2009).

The Federal Reserve Act in its initial form did not contain macroeconomic policy objectives assigned to the Federal Reserve System. In accordance with the amendments brought in by the Federal Reserve Reform Act (1977) and the Full Employment and Balanced Growth Act (1978), its duty is “to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates” (Board of Governors of the Federal Reserve System, 2014, section 2A). The Federal Reserve Board currently considers that price stability is achieved at 2 per cent inflation, and has set this rate as its target (Bernanke, 2013b, pp. 18–19).

The policy instrument used by the Federal Reserve is the federal funds rate; that is, the rate of interest at which depository institutions trade balances at the Federal Reserve. Control of the federal funds rate is exercised through four instruments: reserve requirements, contractual clearing balances, discount window lending, and open-market operations (Board of Governors of the Federal Reserve System, 2005, p. 3), the latter being the most significant instrument. Oversight of these operations is set under the responsibility of the Federal Open Market Committee, composed of the seven members of the Board of Governors of the Federal Reserve System and five of the twelve Reserve Bank presidents. The president of the Federal Reserve Bank of New York serves as a permanent member, while the other presidents serve one-year terms on a rotating basis (*ibid.*, pp. 11–12).

The US Federal Reserve contributed to avoiding a major collapse of the US economy during the 2008 financial crisis by acting as a lender of last resort: it provided liquidity through the discount window and created special liquidity and credit facility programmes (Bernanke, 2013a, p. 77). In December 2008, with conventional monetary policy reaching its limits, the US Federal Reserve resorted to large-scale asset purchases, also known as “quantitative easing”: the first round was announced in March 2009, the second one in November 2010, and the third one in September 2012.

On the regulatory front, the US Federal Reserve is in charge of writing and interpreting consumer protection regulations (Board of Governors of the Federal Reserve System, 2005, ch. 6). It is also in charge of supervising and regulating bank holding companies, state-chartered banks that are members of the Federal Reserve System (state member banks), foreign branches of member banks, Edge and agreement corporations, through which US banking organizations may conduct international banking activities, US state-licensed branches, agencies and representative offices of foreign banks, and non-banking activities of foreign banks (*ibid.*, p. 61). In the aftermath of the financial crisis, the Dodd–Frank Wall Street Reform and Consumer Protection Act (2010) enhanced the US Federal Reserve’s regulatory powers, and implementing key Dodd–Frank Act regulatory provisions is now part of its major priorities (Tarullo, 2013).

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See also:

Banking supervision; Central bank independence; Federal Open Market Committee; First and Second Banks of the United States; Inflation targeting; Lender of last resort; Open-market operations; Quantitative easing; Reserve requirements.

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Fiat money

Keynes (1913, p. 26) famously remarked that the Indian rupee was “virtually a [bank]note printed on silver”, by which he meant to suggest two things: that the intrinsic value of the silver did not determine the monetary qualities of the rupee – or even its purchasing

power – and that, being a banknote, it was subject to the decrees of the Indian government. The rupee was indeed a means of payment, not because it was silver, but because government fiat declared it so. If this is the case for a silver coin, then most or all money may be, at least in part, fiat money, because of government decree.

A long tradition has distinguished money of intrinsic value (that is, money based on precious metals) from paper money and bank money. The former monies are “real”, and the quantity and value depend on the working of markets; the latter are “fiat money”, based on State declarations, and therefore subject to the whims and interests of inherently unreliable politicians. But perhaps these forms of money are not so distinct; perhaps fiat money also reflects the markets, and real money rests in part on the rules and policies of the State (Bell and Nell, 2003).

Indeed, this is the position of “State money” theorists, drawing on the work of Knapp (1924 [1973]), and reflected today in the so-called Modern Money Theory (MMT) approach. A sum of money is a number of units of account, which carry a stable value over time, and are generally acceptable in trade. These units of account are defined by the monetary authorities of the State, and are expressed in an official medium of exchange – gold, silver, other metals, paper, or even an intangible accounting system. The medium will bear a seal of authority, as when the monarch’s image is stamped on the coin or appears on the specially designed paper. This matters: the value of a coin is normally greater than the value of the metal it contains. The seal serves as a guarantee that the coin, even if damaged, will be accepted at face value in paying taxes, or can be exchanged at the Treasury for a full weight coin. (This is sometimes referred to as the “fiduciary” element in the value of the coin.) Of course, the cost of minting the coin must be covered; in addition, the face value of the coin is “marked up” over the value of the metal it contains by what is called the “seigniorage”. This covers the cost of maintaining the currency and preventing counterfeiting, and provides a profit to the crown. In fact, paper money has no intrinsic value, but its issue has to be carefully limited, and counterfeiting prevented. Properly managed paper money will be accepted in general use, because it is the medium in which taxes are paid. It is State money *par excellence*. Bank money, in turn, consists of deposits of State money, with the caveat that banks can create State money by making loans in accordance with the rules of the State-regulated banking system.

Mundell (1961) objected that national currencies often circulate outside their national boundaries, within a currency area, defined by the mobility of factors of production, especially labour. He was thus interested in defining “optimum currency areas”. At the time he wrote, the Eastern United States and Eastern Canada were both primarily industrial and quite similar, while the economies of the Western parts of both countries rested primarily on mining and extractive activities. So instead of a US dollar and a Canadian dollar, there should have been an Eastern dollar and a Western dollar. Joint US–Canadian central banks, or monetary authorities, would be established in the East and the West to administer the currencies.

Within the framework of conventional neoclassical assumptions (sufficient information, foresight, and mobility to realize competitive equilibrium), this may make sense, but it only serves to highlight the inadequacy of these assumptions. For a currency to be accepted, it must be the case that it has backing and regulation. “Backing” means, at a minimum, that a sovereign entity – one with what Adam Smith called “police powers” – will accept it in payment of taxes, fees, fines and so on, and that these taxes and fees

will be large enough to provide a guarantee that any holdings of currency can be passed along to agents who will need to pay the sovereign, or who can pass them along, again (and so on), to agents who will need to pay taxes and the like. “Regulation” means, at a minimum, that the sovereign uses its police powers to guarantee that transactions will normally be fair and honest, and that the institutions operating with money will act in accord with the laws. (The wild fluctuations in the exchange rate of bitcoins, and the unexplained disappearance of over half a billion dollars worth of them, illustrate what can happen when a currency has neither backing nor regulation.) A currency must be backed and regulated by a sovereign; a non-sovereign agency will not be enough when trouble strikes. The Articles of Confederation in the United States showed this in the eighteenth century and the present difficulties of the euro underline this point again today.

“Fiat money” is a misleading term: the “fiat” by itself, declaring a currency acceptable as tax payment, is not enough, as the Continental, the French assignat, and the Confederate dollar all demonstrate. They and many others found that a “fiat”, even with promises of later convertibility to gold or land, did not render a currency acceptable. The government issuing the fiat has to be strong and stable, accepted as legitimate, so that the taxes will be legitimate, and, most of all, the currency itself has to be institutionalized: its issue must be limited and governed by rules, and transactions monitored. This means that the currency should not disappear or be redirected or stolen during the course of transactions. It cannot be counterfeited or faked. Banks must be monitored and deposits guaranteed. In short, a currency has to be regulated by a strong and legitimate government (Nell, 2011).

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See also:

Bank deposits; Bank money; Chartalism; Modern Money Theory; Money and credit; Optimum currency area; State money.

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Finance and economic growth

It is by now widely acknowledged that finance matters for economic growth and that the financial system may have an important impact on the speed and the stability of economic growth. Following “real analysis” (Schumpeter, 1954, p.277) and hence the “classical dichotomy” between the “real” and the “monetary” spheres of the economy, classical, neoclassical and new classical mainstream economics consider that the growth of economic activity is determined by “real” forces only. However, there have always been dissenting views in the history of economic thought relying on “monetary analysis” (ibid., p. 278), in which monetary and financial factors matter for the determination of

output and economic growth beyond the short run. Outstanding examples are the contributions by Marx (1894) on the role of credit for economic expansion and instability, by Schumpeter (1912) on the generation of credit “out of nothing” as a precondition for investment finance by innovative entrepreneurs triggering an economic upswing, and Keynes’s (1933 [1987]) plea for a “monetary theory of production”, as well as his clarifications of the role of finance generated and provided by banks for economic expansion (Keynes, 1973).

The dominating contemporary orthodox views on finance and economic growth are based on the supply-driven new growth theory and the asymmetric information approach to the financial sector (Pagano, 1993). These approaches assume exogenous money under the control of the central bank. Commercial banks and other financial institutions act merely as intermediaries between the pool of saving and investment. Saving thus determines investment and hence economic growth. Because of asymmetric information, an appropriate financial system promotes economic growth through the following channels (Levine, 2005):

- (1) it generates information about profitable investment projects and thus improves the allocation of capital;
- (2) it monitors the use of funds in the investment process, thus improving information and reducing moral hazard;
- (3) it improves the trading, diversification and thus the management of risk;
- (4) it mobilizes and pools saving; and
- (5) it reduces transaction and information costs for the exchange of goods and services.

Focusing on indicators like bank deposits–GDP, credit–GDP, stock market capitalization–GDP and stock market turnover ratios, abundant empirical research has been produced with no clear-cut findings regarding the superiority of bank-based over capital-market-based financial systems, or vice versa. The general consensus has rather been that more developed financial systems, both with respect to banks and capital markets, are conducive to economic growth (Levine, 2005). However, recent empirical studies have questioned the causality and have also suggested that the positive relationship between finance and economic growth has weakened over time and may have even been reversed (Ang, 2008; Cecchetti and Kharroubi, 2012; Sawyer, 2014).

Modern heterodox views on the relationship between finance and economic growth, and the post-Keynesian approaches in particular, are based on demand-driven growth models (Hein, 2014), in which money, credit and finance are endogenously generated through the interaction of the central bank with the financial and the non-financial sectors of the economy. The banking sector plays a particular role in generating credit money and creating “initial finance” for investment, which then generates income and saving. The latter is then available for “final finance” or long-term funding of investment projects. A well-functioning banking sector, consisting of a central bank and commercial banks, is required to get the investment and economic growth processes started by providing required liquidity (Bossone, 2001). The role of financial markets is then to allocate accumulated savings generated by investment. The importance of financial markets will increase when savings, and thus financial wealth, rise (with no equivalent rise in the demand for holding

liquidity generated by central banks). A combination of the liberalization of national and international financial markets, the introduction of new financial instruments, changes in corporate governance, and so on, may lead to a dysfunctional increase in finance, which increases instability and hinders investment and economic growth, as has been analysed in the literature on “financialization” and “finance-dominated capitalism” (Hein, 2012; Palley, 2013). In this perspective, the dominance of finance contributes to redistribution at the expense of (low) labour incomes, thus dampening income-financed consumption demand. It discourages investment in real capital stock and thus in long-term development of the firm by warping managers’ incentives in favour of short-term profits generated by financial investment. This leaves debt-financed household demand for consumption or debt-financed external demand improving net exports as the only drivers of economic growth, carrying with them the seeds of instability and crisis through over-indebtedness of private households and the external sector.

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See also:

Asymmetric information; Classical dichotomy; Financial instability; Financialization; Keynes as monetary theorist; Marx, Karl; Monetary circuit; Money and credit; Money creation and economic growth.

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Financial bubble

Financial bubbles have a long tradition in academic literature. Early references to “bubbles” can be found in Keynes’s (1936 [2007], pp. 158–9) *General Theory*, but the widespread use of this expression in the financial sphere has been popularized by the pioneering contributions of Minsky (1975 [2008]) and Kindleberger (1978). Later, increasingly since the 1980s, a growing number of studies have attempted to analyse the dynamics leading to the emergence of financial bubbles, especially in the framework of general equilibrium analysis (see, in this regard, Tirole, 1985).

Conceptually, a financial bubble exists “if the reason that the price [of a financial asset] is high today is *only* because investors believe that the selling price will be high tomorrow – when ‘fundamental’ factors do not seem to justify such a price” (Stiglitz, 1990, p. 13, emphasis in the original). To put it in a nutshell, a financial bubble implies that the price of a financial asset deviates in a significant and persistent way from its so-called fundamental value (which, according to conventional financial theory, represents the discounted sum of future forecasted dividends over an infinite time horizon) because investors buy an asset today with the expectation of selling it in the future at a higher price, thus realizing a capital gain.

From an analytical standpoint, a distinction is usually drawn between “rational” and “irrational” bubbles. As the expression suggests, the former are consistent with the rational expectations and efficient markets framework. Even if investors behave rationally – that is, taking all available information and fundamental factors into account – “rational” bubbles emerge owing to self-fulfilling expectations or some other market failures, such as incomplete markets or information asymmetries. On the other hand, “irrational” bubbles imply an irrational bias on the part of investors – a sort of “irrational exuberance”, in the words of Greenspan (1996). Investors are thus misled into overstating an asset’s expected discounted stream of dividends, thereby forming excessively optimistic expectations about its fundamentals. Phenomena such as herding behaviour or flawed perceptions of fundamental values may explain the emergence of “irrational” bubbles (see Coudert and Verhille, 2001, pp. 101–02, for analytical elaboration and references).

Now, regardless of the nature of a financial bubble, a time-honoured debate is centered on whether central banks, owing to the potentially high costs of a bursting financial bubble in terms of output losses and financial system instability, should seek actively to lean against an inflating bubble in the quest for preserving macroeconomic and financial stability over a more distant horizon than the conventional one-to-three-year horizon relevant for monetary policy. To be sure, the pre-crisis consensus on monetary policy was firmly anchored in the belief that central banks should follow a “benign neglect” policy as regards financial bubbles. On the one hand, central banks should not react to or prick what they may perceive as an incipient bubble, except in so far as its build-up has implications for the path of output and inflation over the medium run and, hence, risks jeopardizing the attainment of the ultimate goals of monetary policy, to wit, price stability and sustainable output growth. This belief is supported by the efficient market hypothesis, according to which markets always price financial assets at their fundamental value, thereby ruling out the existence of bubbles. Likewise, even if financial bubbles were assumed to exist, the main policy tool at the disposal of central banks – to wit, the short-run interest rate – is too blunt a tool to defuse an incipient bubble. As a matter of fact,

nothing except a large increase in the key policy rate of interest is necessary to rein in an inflating bubble, which would depress economic activity considerably. Finally, especially when investors' expected returns are abnormally high, even a sizeable tightening of the monetary policy stance may not prevent a bubble from inflating further. On the other hand, as soon as the bubble bursts, central banks must "clean up the mess" and take whatever measures are necessary to mitigate the economic fallout and avoid the potential disinflationary pressures unleashed by a bursting bubble. All in all, the "benign neglect" approach is highly asymmetric as regards the treatment of suspected financial bubbles. This creates a potential moral hazard problem among market participants (commonly referred to as the "Greenspan put") that sows the seeds for potentially even larger bubbles in the future.

Now, the 2008–09 global financial crisis, which was triggered by the bursting of a major financial bubble in the US real estate market, has challenged the conventional wisdom and swung the ideological climate with respect to financial bubbles back in favour of a more pragmatic approach. A growing number of economists and central bankers (see, among others, Kohn, 2008) have partially recanted their ideological positions and acknowledged that addressing an inflating bubble early enough through a "leaning against the wind" (LATW) policy may, in some cases, yield potential benefits. This notwithstanding, financial bubbles remain hardly identifiable on a real-time basis or at an early stage of development, thus complicating the implementation of a timely calibrated monetary policy response. Further, the ideological and institutional framework governing inflation-targeting regimes constitutes, to date, an obstacle for the implementation of an effective LATW policy. Indeed, especially if a bubble emerges against the backcloth of strong economic activity and subdued inflationary pressures, any tightening of the monetary policy stance in order to enhance macroeconomic and financial stability in a more distant future will hardly be explainable and justifiable to market participants and will likely face huge political opposition. To overcome these difficulties, other more targeted tools are currently being considered in the area of macroprudential policy to lean against incipient financial bubbles, especially if these are accompanied by other imbalances, such as excessive credit growth.

FABIO S. PANZERA

See also:

Asset price inflation; Bubble; Efficient markets theory; Financial crisis; Financial instability; Greenspan, Alan; Housing bubble; Inflation targeting; Macro-prudential policies; Minsky, Hyman Philip.

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Financial crisis

The global financial crisis of 2008–09 led to some questioning of the neoclassical orthodoxy on the grounds that it had failed to foresee this momentous event (see *The Economist*, 2009; Krugman, 2009; Colander, 2010). Such criticism is justified. The mainstream's principal notions – the rationality of its *homo oeconomicus*, the self-balancing propensity of markets, money's neutrality, and macroeconomic models devoid of any significant role for finance – all combine to make it conceptually hard to imagine how financial crises may ever develop from within the growth dynamics of capitalist economies. If financial crises arise at all, in this view, they do so as exogenous shocks in response to which asymmetric information problems between lenders and borrowers (for instance, adverse selection and moral hazard) intensify to the point of destabilizing credit. (An early proponent of the information-asymmetry school of financial crises is Mishkin, 1991.) Corollary to this benign view is a theory of finance known as the efficient-market hypothesis (Fama, 1970), according to which financial markets always price the various claims correctly, making it impossible to conceive of sudden financial-market crashes as a recurrent feature.

It is a fact, however, that we have had a pattern of repeated incidences of financial instability, and a good number of them have proven capable of disrupting economic activity. Students of financial crises (Kindleberger, 1978; Wolfson, 1986; Reinhart and Rogoff, 2009) conclude that this is a phenomenon intrinsic to our economic system. The major heterodox economists – Karl Marx, John Maynard Keynes, Joseph Schumpeter – all built their alternative theoretical frameworks on the notion that business-cycle fluctuations of industrial production were driven forward by a parallel credit cycle emanating from the financial sector, whereby the build-up of excess productive capacity got fuelled by credit over-extension until these intertwined processes could no longer be sustained. It is at this point that a financial crisis erupts so as to trigger necessary adjustments correcting the excess accumulations of debt and productive capacity. (Whereas Marx (1894 [1957]) emphasized overproduction and falling profit rates, Keynes (1936) saw inadequate demand as the main culprit ("underconsumption").) If allowed unchecked, such a crisis-driven adjustment process may get out of hand and set off, as highlighted in convincing fashion by Fisher (1933), a debt-deflation spiral pushing the economy straight into depression.

One pertinent theory of financial crises has been developed by Minsky (1986, 1992), who argued that financial instability arises typically when a euphoric upswing phase has induced too many economic actors to take on too much debt relative to their income-generation potential, so that they find themselves having to borrow more just to service their old debts. Another post-Keynesian viewpoint, as in Stockhammer (2012) and Tridico (2012), relates financial crises more structurally to growing income inequality and the need to sustain spending levels in the face of stagnant incomes through increased indebtedness.

We know from history that there are all kinds of financial crises. We may experience

stock-market crashes exerting powerful squeezes on the corporate sector and making investors feel suddenly much poorer, or currency crises forcing brutal devaluations, or sovereign-bond crises imposing painful austerity. We may have crises that are strictly local or ones that engulf the entire globe. They may pass rapidly without too much impact on the “real” economy or they may have strongly negative effects on employment and production for a long time. Amidst that great divergence in cause and scope, three things stand out about the kinds of financial crises that truly matter. First, they often occur in the framework of financial innovations opening up new avenues of wealth accumulation, most powerfully in the form of asset bubbles that eventually burst and so trigger a crisis (see Guttman, 2009). Second, they are highly dynamic and interactive processes that have a lot of contagion potential, as they disrupt transactions, destroy values, and homogenize expectations into panics. Third, they become a serious threat to the well-being of entire societies when they hit the banking sector to the point of a credit crunch (see Wojnilower, 1980).

Because of their potential for spreading paralysis, financial crises have to be managed lest they be allowed to depress the whole economy. Following the trauma caused by non-intervention during the Great Depression of the 1930s, governments have introduced a growing number of crisis-management tools such as safety regulations for strategic markets and institutions (for instance, minimum capital requirements), deposit insurance, “lender-of-last-resort” facilities for emergencies, and asset-purchase programmes. Central banks, in particular, have the responsibility to intervene during financial crises and the means to do so effectively. These interventions are inherently difficult, since they must be targeted correctly and are often politically controversial. After each systemic financial crisis, there are major lessons to be learned for better crisis management the next time around.

ROBERT GUTTMANN

See also:

Asymmetric information; Debt deflation; Efficient markets theory; Financial bubble; Financial innovation; Financial instability; Lender of last resort; Marx, Karl; Minsky, Hyman Philip; Money neutrality.

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Financial deregulation

In a broad sense, the concept of financial deregulation refers to the gradual elimination of the financial regulation that was born out of the Great Depression and the early post-war period, particularly as applied to interest rates, exchange rates and international flows of capital. The concept also refers to the application of many other controls over financial markets, for example regulations on commissions that can be earned in stock markets or on the conditions of stock and bond issuance. Also covered by this concept are the removal of controls on the specialization and size of financial intermediaries, as well as on the geographic space of markets, including the lifting of controls over the expansion of cross-border financial transactions.

Financial deregulation is a process that has occurred in almost all countries, but usually as a reaction to what is happening in other markets, because policy makers have considered that financial regulations impose competitive disadvantages. During the 1980s, the deregulation of interest rates, both on the assets and liabilities sides, was promoted largely as a response to the unregulated operation of several large institutions in the London-based Euromarket. During the same years, many of the existing capital controls began to be lifted in the largest North Atlantic financial markets, and by the 1990s the widespread mobility of capital began to be characterized as financial globalization.

The most widely-cited arguments in favour of financial deregulation have been offered by McKinnon (1973) and Shaw (1973), who consider that financial regulation represses the growth of savings and inefficiently distributes financing. Therefore, financial deregulation – particularly the removal of controls on interest rates and exchange rates – would promote efficient and competitive financial markets. In the same vein, authors such as Kaminsky and Schmuckler (2003) have hailed the great advances in financial deregulation.

Over the same period, a number of critics pointed to the prominent role that financial deregulation played in causing financial crises, notably as regards the occurrence of the latter in the developing world during the 1990s (Correa, 1998; Stallings and Studart, 2003). Likewise, the US financial crisis that erupted in 2007 highlighted banks' role in fuelling speculative activity by credit expansion and fraud. The fundamental role that banks play in creating and nurturing these elements that converge into financial crises is most famously synthesized by Kindleberger (1989). The report published by the Financial Crisis Inquiry Commission (2011) shows in great detail how bank-led speculative mania, fraud, and leverage all played decisive roles in the genesis and transmission of crises.

Within this historical framework, ideas regarding the regulation and deregulation of financial markets have been actively debated during the past 40 years since the movement toward financial deregulation began. As a result of the financial crises witnessed during the first years of the twenty-first century, issues of financial regulation have been addressed by the Group of 20 countries (G20), seeking to reach agreements on national and international commitments to prevent future global financial crises. Among the most important elements that have been considered are:

- (1) rules on capitalization for financial institutions, so that capital and reserve requirements increase commensurate with greater risk taken;
- (2) concerted government responses in anticipation of the possible failing of systemically important global financial entities, known as effective resolution regimes for financial institutions;
- (3) regulations on the issuance of securities with underlying mortgages (Principles of sound residential mortgages underwriting practices); and
- (4) regulation of ratings agencies (Principles for reducing reliance on CRA ratings) and enhanced cooperation between governments in order to alleviate future international financial crises (Principles for cross-border cooperation on crisis management).

However, the most critical authors on financial deregulation (Guttman, 1997; Correa, 1998; Stiglitz, 2003; Kregel, 2010; Wray, 2011; Epstein and Crotty, 2013), who consider the latter as an important factor in contributing to global financial crises, have debated other important points pertaining to regulation, such as:

- (1) controlling the size of financial institutions and limiting their international exposure;
- (2) prohibiting some of those financial instruments such as collateralized debt obligations that have proved to be sources of enormous volatility in markets;
- (3) increasing transparency of off-balance-sheet operations of all financial intermediaries, regulating the shadow banking sector and its transactions;
- (4) introducing financial transaction taxes; and
- (5) introducing capital controls, and even constructing a new international financial architecture, such as that suggested in the Stiglitz Report (United Nations, 2009).

Going forward, issues of how much deregulation or re-regulation should take place, who should be in charge of such changes, and what degree of global coordination will be necessary, will certainly continue to be debated. However, the main objective lies in creating and maintaining stable financing to sustain investment and employment.

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See also:

Basel Agreements; Capital controls; Financial crisis; Financial transactions tax; Reserve requirements; Systemically important financial institutions.

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Financial innovation

Financial innovation is defined as "the act of creating and then popularizing new financial instruments, technologies, institutions, markets, processes and business models – including the new application of existing ideas in a different market context" (World Economic Forum, 2012, p. 16).

Merton and Bodie (1995) and Tufano (2003) provide categorizations of financial innovations according to the functions they have been serving, throughout history, in terms of reducing financial markets imperfections such as transaction costs (including asymmetric information), missing markets, and the existence of taxes and regulation. As a result, financial innovations have facilitated trade and provided ways of managing risk.

By contrast, the conceptualization of financial innovation presented by heterodox economics is grounded in the separation between financial and industrial capital (see Niggle, 1986). This separation can be traced back at least to Karl Marx and is germane to the duality of the role of finance, which may be "extraordinarily powerful in mobilising and allocating finance for the purpose of real investment. But, by the same token, it can both trigger and amplify monumental crises" (Fine, 2007, p. 4).

The key thinker about the crucial role played by innovation is Joseph A. Schumpeter, who associated it with the famous expression "creative destruction" (Schumpeter, 1942, p. 82). Schumpeter kept the separation between industrial and financial capital epitomized by the entrepreneur and the banker respectively, emphasized the role of bankers in the provision of credit to finance new ventures, but denied that financial innovation can play the role of prime mover in the business cycle (see Leathers and Raines, 2004). However, owing to entrepreneurs' spending for their new ventures, positive expectations of increasing incomes and investment expenditure continue to rise, causing a "secondary wave" that is mainly speculative, as it does not have "any impulse from the real driving

force” (Schumpeter, 1961, p.226). Productive debt finances innovations and business expansion that is productivity-enhancing, while unproductive debt is used for consumption, speculative business and financial speculation, which induce a vicious cycle of credit expansion and price increases.

Innovations not only make several sectors redundant; they also reduce production costs, owing to productivity-enhancing processes. This gives rise to a widespread downward pressure on prices, which is amplified when unproductive debt is predominant, and when individual bankers reduce their lending causing further liquidations.

We owe a systematic approach to uncertainty to John Maynard Keynes. When organized security markets provide liquidity for investors committed to durable assets, the uncertainty faced by investors is contained. In a nutshell, for Keynes, in an uncertain world, financial innovations shift investors’ preferences from analysis of long-run earning prospects of physical capital investments, to speculation in short-term movements in securities prices. This causes, ultimately, a destabilizing effect on the economy as a whole (see Carter, 1992; Carvalho, 1997).

A different way to consider the role of financial innovation in the interaction between financial and industrial capital is to consider that the investment process is originated when the finance provided to investors is spent, which supports new transactions and initiates a multiplier process and an increase in aggregate income that guarantees that savings will be sufficient to fund debt (Carvalho, 1997).

In a Minskyian framework, the working of the mechanism explained above is not independent of the financial structure of the economy: the widespread availability of an extended range of financial products after the deregulation processes in the 1980s has encouraged investors to finance capital formation with short-term instruments. These maturity mismatches make balance sheets more fragile to shocks. According to Minsky (1986), however, the financial structure has evolved endogenously through history: today’s money-manager capitalism emerged as “a consequence of institutional innovations and the growth of private pensions that supplemented social security” (Minsky and Whalen, 1996–97, p.158). Because capitalism evolves with its ever-changing predominant financial structure, these transformations challenge the barriers to contain instability represented by the regulatory structure. For this reason, it is essential that the legislated institutional structure evolves to keep pace with the dynamics of the financial structure; but regulation can, on the other hand, even trigger financial innovation.

In summary, the role of financial innovation is relevant in a dynamic economy. Neoclassical economics focuses on how it serves to correct market imperfections, while heterodox economics contextualizes it within the relation between industrial and financial capital in an uncertain world. In this respect, financial innovation may enhance allocative efficiency and serve capital formation or may exacerbate or even trigger crises.

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See also:

Asymmetric information; Financial crisis; Marx, Karl; Minsky, Hyman Philip; Money and credit.

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Financial instability

Since the 1980s, advanced and emerging economies have undergone recurrent bouts of financial instability, which in some cases have culminated in extreme periods of financial distress – that is, financial crises. In light of the extraordinarily high macroeconomic and fiscal costs imposed by these crises, preventing the emergence (or containing the materialization) of financial instability has become a key objective of central banks around the world. In addition to their mandate to foster price stability (that is, ensuring the stability of the purchasing power of money) and promote sustainable economic growth, central banks have been increasingly monitoring financial sector developments in order to ensure a smooth functioning of the three pillars that make up the financial system, to wit, financial institutions, markets, and infrastructures. The regular publication of Financial Stability Reports aiming at identifying threats to financial stability is nothing but a reflection of the increased attention devoted by central banks and multilateral institutions to financial instability issues.

As Crockett (1997, p. 2) puts it, financial instability can be defined "as a situation in which economic performance is potentially impaired by fluctuations in the price of financial assets or in the ability of financial intermediaries to meet their contractual obligations." Episodes of financial instability are thus intimately related to the "real side" of the economy, impacting adversely the level of economic activity through various channels (asset prices and credit flows, just to mention the most relevant ones). Nonetheless, unlike price stability, which has a clear definition and can be measured, the same degree of intellectual clarity has not yet emerged as regards financial instability. As a matter of fact, both financial instability and its positive counterpart, financial stability, lack widely accepted definitions and measurement techniques, although a growing literature has tried to fill this void after the inception of the 2008–09 global financial crisis (Borio and Drehmann, 2009, review the literature on this subject matter). These deficiencies partly

reflect the lack of a unified analytical framework underpinning financial instability and partly the multi-faceted nature of the latter.

Specifically, as far as the former rationale is concerned, if one analyses financial instability through the lens of the (still dominant) New Keynesian paradigm for policy making – whose underlying general-equilibrium framework relegates monetary and financial considerations to the sidelines and treats time in a deterministic fashion – financial instability cannot but be interpreted as an exogenous phenomenon occurring outside the realm of the economy because of shocks hitting the economy randomly or improper government policies (Schroeder, 2009, p. 292; Tymoigne, 2010, p. 2). Thus, any distinction between financial fragility and financial instability remains blurred within the settings of the New Keynesian framework, up to a point where the two concepts conflate into one (Aspachs et al., 2007, p. 41, for instance, define financial fragility as a combination of high probability of defaults and low bank profitability). The interpretation of financial instability as a random, exogenous event and its conflation with financial fragility both bear important implications from a policy perspective, notably as they limit policy makers' ability to detect the onset of financial instability at early stages of its development and to mitigate it through appropriate pre-emptive (corrective) measures.

On the other hand, drawing on Minsky's (1982a) financial instability hypothesis (FIH), the Post-Keynesian School rather accounts for financial instability in an endogenous fashion, as an endemic pathology of the working of market-based capitalist economies. These economies are inherently unstable by virtue of their propensity to migrate endogenously from periods of prolonged stability to periods dominated by financial instability. By putting money, finance and uncertainty at the core of the analysis, not only does the Post-Keynesian School conceive of financial instability as a natural by-product of the inner working of capitalist economies, but it also devotes special attention to financial fragility as a harbinger of financial instability. To put it into a nutshell, prolonged periods of economic stability breed over-optimism among economic agents, mainly firms and banks, which increasingly rely on debt to finance investment and positions in capital assets. The excessive reliance on debt increases the fragility of the economy as a whole, as epitomized by the shift from conservative "hedge" to speculative "Ponzi" financial structures, nurturing the seeds of future instability down the road. Financial instability eventually manifests itself through a Fisherian debt-deflation process, jeopardizing economic activity (see Minsky, 1982b, p. 67).

Accordingly, an implication of Minsky's FIH is that preventing the emergence of financial instability (or, at worst, limiting its severity) requires policy actions aimed at constraining the build-up of fragility during periods of stability and economic expansion. These policy actions may elicit direct central bank intervention, either through a tightening of the monetary policy stance and/or the implementation of appropriate micro-prudential and macro-prudential policies. Their goal is to prevent the build-up of systemic risk before its materialization impairs the working of the financial system and imposes costs on the whole economy.

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See also:

Asset price inflation; Debt deflation; Financial crisis; Financial instability hypothesis; Macro-prudential policies; Minsky, Hyman Philip.

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Financial instability hypothesis

The "financial instability hypothesis" is the term given by the American economist Hyman P. Minsky to his theory explaining why capitalist market economies are prone to instability. The theory integrates macroeconomic analysis with an original microeconomic view of how capitalist firms operate. Financial fragility refers to the build-up of debt that precedes the breakdown in economic activity, in a market capitalist economy with a sophisticated debt-based financial system. The crisis then bequeaths a legacy of unsustainable debt to succeeding periods until a boom revives expenditure and sales revenue sufficiently to make the debt burden manageable, whereupon the cyclical build-up of debt resumes.

The macroeconomic part of the analysis is essentially a business cycle theory in which booms and slumps are driven by business investment in fixed capital. Rising investment causes an increase in general economic activity and sales revenue. Falling investment causes a decline in business activity in general, and a fall in sales revenue. This part of Minsky's analysis was drawn from the work of John Maynard Keynes and his *General Theory* (1936). However, Minsky considered that as investment rose it would become financed by borrowing. The rising debt levels would need to be serviced out of sales revenue, so that if investment, and the resulting sales revenue, fell off, businesses would succumb to a debt crisis. The crisis is then a prelude to economic recession, possibly even a prolonged depression (Minsky was always conscious in his analysis of the possible recurrence of the 1930s depression through which he had lived in the second decade of his life).

The microeconomic part of the analysis is a highly original approach to economic decision-making in which economic agents (households, banks and firms) make decisions on the basis not just of income and expenditure, as postulated in conventional microeconomic analysis, but also on their balance sheets. Minsky recognized that, with credit, it is possible to generate cash flow not only from selling commodities, but also from selling assets or entering into debt contracts. A balance sheet therefore represented for Minsky a set of dated financial commitments (liabilities) or claims (assets). The survival of firms therefore depends on the liquidity of those claims and credit availability, as well as the flows of income from which to service those financial commitments.

The liabilities side of a balance sheet was what Minsky called a financing structure. It could be a “hedge” financing structure, if the income derived from the assets covered financial commitments at all times; or it could be a “speculative” financing structure, if income at times fell short of commitments, but overall covered those commitments; or it could be a “Ponzi” financing structure, if income overall would not cover commitments, so that the firm would end up with expanding liabilities relative to assets. Financial fragility was marked by “deteriorating” financing structures, with “hedge” financing becoming “speculative” finance, and “speculative” financing becoming “Ponzi” finance (Minsky, 1982; Minsky, 1986, ch. 9 and appendix A).

For Minsky, business investment was always speculative, unless it was wholly financed from firms’ reserves or internal finance. But investment is crucial because it generates sales revenue and in this way circulates the liquidity in balance sheets around other balance sheets in the economy. The balance sheets in the economy set a threshold which business investment must achieve to secure expected payments on debt liabilities. When investment falls below this threshold, balance sheets deteriorate as a prelude to financial crisis.

The financial instability hypothesis therefore explains how a financial crisis breaks out because of inadequate business investment, rather than because of interdependent balance sheets (economic units whose assets are the liabilities of other economic units), or because of falling asset prices, as some commentators have suggested (see Toporowski, 2005, ch. 14; Kregel, 2012).

In practice, there are three complications that suggest inconsistencies in Minsky’s analysis. The first is the issue of equity finance. This, in Minsky’s view, is a classic form of “hedge” finance, because financial commitments are contingent upon adequate operating profits. Recent economic booms in the United States and in Britain have been marked by shifts towards equity financing, and hence a more stable and sustainable form of finance. Yet financial crises broke out at the end of the 1990s and after 2008. A second complication is the existence of deposits that are the counterpart of borrowing to finance investment. These deposits must appear somewhere and would normally emerge as the profits of firms in the economy. Debt-financed investment may therefore provide its own “hedge” (although not necessarily for the firms incurring the debt). Finally, there is the matter of smaller enterprises that do not have access to, or simply do not make use of, sophisticated financing. Such firms may not be very significant as business investors. They are important, however, for output and employment in most countries.

Despite these gaps and inconsistencies, the financial instability hypothesis remains the most complex attempt to model business cycles in capitalist economies using sophisticated credit. In its conclusions about the nature of finance and its operations, the theory is not so much a “hypothesis” as a penetrating critique of the way in which free markets in banking and finance work, whose insights have not been equalled by Minsky’s critics (most notably in Kindleberger and Laffargue, 1982).

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See also:

Asset price inflation; Debt deflation; Financial crisis; Financial instability; Macro-prudential policies; Minsky, Hyman Philip.

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Financial integration

Financial integration consists of the (increasing) interconnection of banking systems and financial markets, and of the strengthening of debit/credit relationships among economic units (firms, banks, households and governments) located in different geographical areas. Such a cross-border interconnection of economic units, markets and institutions mainly operates through three different, though linked, channels:

- (1) the removal of national barriers to capital movements;
- (2) the practice of States ceding full control over monetary policy to independent and politically insulated central banks that are mostly focused on inflation targeting (see Major, 2012); and
- (3) the change in economic policy, in favour of “scientific” monetary policy rules as opposed to discretionary (that is, “politically biased”) fiscal measures (see Gabor, 2014).

Focusing on the second channel, inflation targeting is commonly pursued through the steering of the targeted short-term nominal rate of interest (in the unsecured money market) and/or the pegging of the national currency to a stronger one. As a result, financial integration is often associated with a certain degree of loss of monetary and fiscal sovereignty (of weakest or “peripheral” countries at least).

The standard indicator employed by economists in order to test the degree of financial integration of a given country (with either the rest of the world or another economic area) is the sum of amounts of cross-border assets and liabilities as a percentage of Gross Domestic Product (GDP). Other indicators are the amount of foreign investment to GDP, the degree of synchronization (that is, statistical correlation) in the movement of asset prices and stock-exchange indexes, the convergence in inflation and interest rates, and the trend in cross-border activities undertaken by banks and other financial operators.

The process of financial integration is not an exclusive feature of today’s financially sophisticated capitalist economies. It appeared in the late seventeenth century and gained momentum in the period from the mid 1870s to the First World War (the so-called “gold standard era”). The inter-war years interrupted the process of financial integration, which restarted in the 1950s, accelerated in the 1970s–1980s, and achieved its peak at the end of the 1990s after the end of the Cold War. It was promoted by Anglo-Saxon

economies and then increasingly involved other economies. Since the 1970s, policies aiming to liberalize capital movements have been imposed by the International Monetary Fund and the US government (as the necessary condition to access international financial aids) to a number of developing countries, in the wake of the so-called “Washington consensus”. In continental Europe, the removal of national barriers in financial activities and other services was mainly promoted by the “Single Market Act” of the European Union passed in 1986 and enacted in 1992. The recent financial crises that affected advanced economies, and the emancipation of a number of Asiatic and South-American countries from the “Washington consensus”, could represent a new turning point in the process of worldwide economic and financial integration.

The enhancing of financial integration through the removal of capital controls and through other institutional changes is traditionally considered as a positive phenomenon by both mainstream economists and supranational institutions, because it would support the efficient allocation of capital and labour-force. More precisely, integration measures – it is usually argued – allow capital to move from “core” economies (characterized by a larger stock of capital and hence lower return rates) to “peripheral” economies (with a lower stock of capital and hence higher return rates), therefore triggering a catching-up process in the latter economies. In the absence of capital controls, each country has no longer to solely rely on its own domestic saving to finance investment (see, among others, Feldstein and Horioka, 1980; Blanchard and Giavazzi, 2001). Further, free access to the international capital market expands the opportunities for portfolio diversification, therefore reducing the investors’ risk. However, other economists (many of whom draw on Minsky, 1986) have pointed out the potential destabilizing effects linked to the process of financial integration. The risk of abrupt reversals of capital flows, financial contagion, misallocation of resources (leading to domestic asset bubbles and debt-based consumption), bankruptcy chain-reactions, cross-border transmission of instability, and permanent imbalances in current accounts – all entailed by the process of financial integration – have been recently stressed by the same supranational institutions that promoted that process (see, among others, European Central Bank, 2010; Forster et al., 2011). The point is that, in spite of globalization tendencies, the separation between distinct country-based capitals remains a central feature of today’s capitalist economies. Large transnational corporations and banking groups are still strongly linked to a single country with respect to ownership and management (see Duménil and Lévy, 2004). Consequently, in the presence of asymmetrical shocks, financial integration is suddenly replaced by “home-bias” tendencies and “flight-to-safety” forms of behaviour of investors. Finally, the available empirical evidence suggests “that there might be a point beyond which a country becomes ‘over-integrated’, in the sense that further integration is associated with movement away from rather than towards optimal diversification” (European Central Bank, 2010, p. 70).

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See also:

Asymmetric information; Bubble; Capital controls; Central bank independence; Contagion; International Monetary Fund; Rules versus discretion; Sudden stops.

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Financialization

Financialization is a term that has gained widespread usage in the critical economics literature since the early 2000s, and especially in the aftermath of the 2008–09 global financial crisis. However, the term lacks a clear, agreed-upon definition, and its precise use and form have been ambiguous. At a general level, it refers to the increase in the size, importance and power of financial markets, transactions, institutions, motives and financial elites in the functioning of the economy in the post-1980 era. Some describe the financialization process as a shift from productive activities to financial activities, while others emphasize the dominance of finance in general over economic activities (see Epstein, 2005). In this framework, financial activities include borrowing and lending activities as well as dealings in financial assets such as stocks, bonds, derivatives, futures, and other types of securities. These activities are distinguished from non-financial activities, which include the production and distribution of goods and the production and distribution of services that are not directly related to financial activities.

At the firm level, financialization is used to designate changes in the relationship between the non-financial corporate sector and financial markets. These changes are twofold: on the one hand, non-financial corporations began increasing their acquisition of financial assets and deriving an increasing share of their income from financial sources. On the other hand, the management of non-financial corporations came under increased pressure from financial markets to maximize short-run returns, which led to increased payments to financial markets in the forms of interest payments, dividend payments and stock buybacks (see Orhangazi, 2008).

There are also some more specific uses of the term, such as "financialization of commodities" or "financialization of food", in which financialization refers to increased financial activity in markets where commodity or food items futures are traded and future streams of revenue from these have been transformed into tradeable financial assets.

Indicators of financialization are abundant. For example, total global financial assets as a percentage of world GDP have increased from 109 per cent in 1980 to 263 per cent in 1990, 310 per cent in 2000, and 355 per cent in 2007. The size of the financial sector with respect to GDP, financial incomes as a percentage of national incomes, financial corporations' profits with respect to non-financial corporations' profits, debt-to-GDP ratios,

non-financial corporations' financial incomes and financial payments have all shown sharp increases since the 1980s (see Orhangazi, 2008, 2012).

While there are different theoretical and historical explanations for the rise of financialization, it is commonly associated with the demise of the Keynesian accumulation regime in the 1970s and the rise of global free-market neoliberalism afterwards. The crisis of the 1970s was characterized by a stagnating economy, declining rates of profit, increased inflation, and bankruptcies. All these, together with the collapse of the Bretton Woods international financial system, created two central dynamics: various attempts to recover profitability and an expansion of finance in an increasingly deregulated/unregulated environment. The collapse of the Bretton Woods system and high rates of inflation led to a number of financial innovations that aimed to address the increased levels of uncertainty and paved the way for decades of complex financial innovations. The rise of institutional investors, such as pension funds and investment funds, contributed to the shift in the balance of power in corporations from managers to financial market participants; and with the contribution of the hostile takeover movement of the 1980s caused significant changes in corporate governance. As the financial sector gained in power, it became very active in pushing for more deregulation. Financial market liberalization and deregulation increased financial investment opportunities, while also allowing for the growth of institutional investors and a surge in non-banking financial institutions.

Financialization received support from mainstream economic and financial theory, which argues that expansion of financial markets enhances efficiency and allows for better management of risk. In addition, the corporate governance literature, which focuses on the relationship between financial markets and firms, argues that the task of firm managers should be to maximize value for shareholders. In order to do this, the interests of shareholders and managers should be aligned. This provides the theoretical background for the expansion of management compensation and stock options as well as increased takeover activity and private equity investment.

Financialization has had a number of consequences. First of all, various types of financial sector activities acquired greater significance with respect to real sector activities, and the transfer of income from the real sector to the financial sector increased. Financial decisions began to dominate real sector activity, and slower economic growth has been associated with financialization. Increased financial fragility and instability, both in the US economy and in the world economy, have also been seen as direct consequences of financialization. For households, it has led to an increased ability to borrow and for non-financial corporations it has precipitated a whole series of changes in firm behaviour. Financialization has also contributed to increasing income and wealth inequality, as it was effective in shifting the balance of power in favour of capital. While the rise of profits and financial incomes – interest and dividend incomes and capital gains – relative to wages was a major factor leading to a concentration of income and wealth at the top, profits made from managing this increasingly concentrated wealth further contributed to the inequalities. Inequality has also further deepened the process of financialization. Increased income and wealth inequality have directed more and more funds into speculation through institutions such as investment and hedge funds.

ÖZGÜR ORHANGAZI

See also:

Bretton Woods regime; Finance and economic growth; Financial crisis; Financial innovation; Financial instability.

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Financial literacy

While no universally-accepted definition of financial literacy exists, one that is broad and often cited comes from the United States President's Advisory Council on Financial Literacy (2008, p.4): "the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial wellbeing." Economists (and other researchers), however, are particularly concerned about two issues regarding financial literacy: (i) how best to improve financial literacy; and (ii) how much of an impact (if any) higher financial literacy rates will have on actual financial behaviour.

One of the most comprehensive studies of Americans' financial knowledge, skills and behaviour comes from the FINRA Investor Education Foundation (2009). They surveyed over 28,000 people across the United States in October 2009. The survey included a basic financial literacy test that resulted in a failing average grade (less than 60 per cent). Also, they found that only 35 per cent of households had enough savings to cover three months of expenses (rainy-day funds). 73 per cent of households had at least one credit card, but only 41 per cent of them reported that in the last 12 months they always paid their debts in full. Despite these findings, over two-thirds of people surveyed ranked themselves as highly knowledgeable about personal finance overall.

Financial illiteracy is a worldwide problem. Recent cross-national studies (see Atkinson and Messy, 2012; Xu and Zia, 2012) show that people in many countries (including the United States) have difficulty answering basic personal finance questions. These studies also found significant similarities between countries as to the most financially illiterate groups. For example, women had comparatively lower financial literacy scores in almost all countries. Further, financial literacy follows an inverted-U shape where younger people and older people have the lowest levels of financial literacy (Xu and Zia, 2012).

The need for improved financial literacy has grown over the past 30 years as the complexity and availability of consumer financial products has expanded (student loans, credit cards, complex mortgages). Also, people are increasingly responsible for their financial planning. For example, in the United States (and other countries) a shift from defined benefit plans (for instance, pensions) to defined contribution plans (for instance, 401(k) plans) has placed a greater burden of retirement planning onto individuals – many of whom, as shown in the FINRA survey quoted above, have trouble managing their basic personal finances. Thus, many 401(k) plans have lower returns and lack long-run risk pooling (Ollerman and Boivie, 2011; Olen, 2012).

Among younger people, the Jump\$tart Coalition for Personal Financial Literacy developed a comprehensive personal finance test that they administered to high-school seniors biennially from 1997 to 2008 (a total sample of over 16,000 students). Students taking the test in 1997 scored an average of 57.3 per cent (the highest score of all six years) compared to 48.3 per cent in 2008 (the lowest score in all six years). The number of students passing the exam (scoring at least 60 per cent) fell from 47.2 per cent in 1997 to 31 per cent in 2008. Perhaps the most disturbing result from Jump\$tart's surveys is that after controlling for factors such as teacher quality and student interest/ability, students who took at least a one-semester course in personal finance performed worse than all other students (Mandell, 2008).

Therefore, it is unlikely that financial literacy alone will keep many people from making adverse financial decisions. Some researchers (see Garon, 2012; Olen, 2012) argue that the reasons people have difficulty managing their finances has less to do with inadequate knowledge and skills and more to do with the domestic economy. Stagnant median wages, rising income inequality, rising costs of health care and education, among other factors, are squeezing the balance sheets of households. As a result, many people accumulate debt – less out of ignorance than a necessity to maintain a standard of living. Financially savvy people are not immune to unemployment, health problems, and rising college costs. Also, significant financial literacy (and legal knowledge) is needed to understand complex credit card contracts, fraudulent mortgage loans and other predatory lending practices.

In addition to these macroeconomic effects, many behavioural economists (and psychologists) argue that personal finance decisions are as much (or more) influenced by emotion as logic. Much of this emotion is culturally driven. As Veblen (1899 [1994], p. 109) wrote, “[p]ropensity for emulation [. . .] is a pervading trait of human nature”. Financial education, therefore, should not only teach basic finance concepts, but also explore the behavioural aspects of spending, saving and investing. An innovative attempt at influencing behaviour while teaching finance skills is through videogames (Tufano et al., 2010). If the argument is valid that violent videogames can beget violence, then it is possible that games promoting financial responsibility can result in greater financial responsibility in the real world. Game on.

ROBERT H. SCOTT

See also:

Financial crisis; Financial innovation; Housing bubble.

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Financial repression

The term "financial repression" (FR) was introduced by McKinnon (1973) and Shaw (1973) in order to analyse State intervention in financial markets. For these authors, banking interest rate regulations (such as corridors limited by ceilings and floors for both loans and deposits), lending rates of development banks or public commercial banks below the "market" rate, reserve requirement ratios or capital controls are some examples of how governments and central banks "repress" free market forces and block the efficient adjustments of the loanable funds market. Of course, the monetization of fiscal deficits is also a type of FR, but because it is related to government expenditures, it has other implications. Let us therefore focus strictly on monetary and financial policies.

FR is largely supported by the Wicksellian approach: any persistent State intervention in order to determine the monetary interest rate below (above) the natural rate of interest (or the natural rate of unemployment in Friedman's approach) generates a cumulative inflationary (deflationary) process. Thus, a persistent expansionary financial and monetary policy will be neutral in "real" terms (that is, without impact on productive capacity).

Consider a hypothetical developing country whose government (via central bank rediscounts to private banks or directly via commercial and development public banks) provides "subsidized" long-term loans at negative real interest rates to accommodate the credit demand of the emerging industrial sector (manufactured exports share is low). According to the FR literature, this example would reflect discretionary allocations of the (scarce) loanable funds that, in this analysis, promote inefficient "crony capitalism". While competitive sectors (commodity exporters, for example) are forced to take expensive credit, inefficient sectors are awarded with cheap credit. Hence, FR would reflect suboptimal and exogenous income redistribution by a sort of taxation that appears with increasing financial costs to competitive sectors.

At some point, FR supposes that "low" (or negative) real interest rates stimulate investment in the short run. However, since this expansionary policy is artificially determined by autonomous forces, it is neutral in the long run. Curiously, although with strong different foundations, the Keynesian "euthanasia of the rentier" and the Kaleckian "principle of increasing risk" also follow a similar short-run analysis, when they point out a negative relationship between the monetary interest rate and investment (Petri, 1993). Given the marginal efficiency of capital and in absence of uncertainty, the entrepreneur should invest when the differential between the profit rate and the interest rate is positive. Thus, as least in analytical terms, by increasing that differential the central bank could achieve full employment. Note that Keynes, in fact, relied more on fiscal rather than

monetary policies, or more precisely on the “socialization of investment”, to achieve full employment.

Therefore, one could conclude that FR is at least a consistent short-run analysis and the theoretical debate would be shifted to a political level between “repressor” governments and “repressed” bankers and landowners. However, from a post-Keynesian or classical Keynesian approach, it is possible to visualize the theoretical problems of the FR analysis. On the one hand, FR assumes the existence of a “natural” rate of interest that equilibrates investment and saving decisions. A decreasing function of the interest rate is impossible, however, unless one accepts the marginalist principle of substitution (Garegnani, 1978, 1979). On the other hand, in a monetary economy it seems reasonable to assume that as a result of competition the profit and interest rates will tend, over a sufficiently long period of time, to move in step with one another. So, there are no motives to take the marginal efficiency of capital as given but as a residual (Pivetti, 1991).

Hence there are no “real” forces capable of being repressed by exogenous monetary and financial variables. The level of the interest rate is not a (real) objective and endogenous outcome but a monetary phenomenon determined by a “convention”. Thus, as the central bank is a special “agent” regulating financial markets and acting as lender of last resort, it can self-validate its own (conventional) policy rates of interest.

Moreover, since the quantity of money is demand determined and credit driven, the developmental strategies adopted in many countries to provide cheap long-term loans to the industrial sector have been impacting on distributive variables rather than determining the investment schedule (which depends on expected demand, if we consider the principle of effective demand). For development banks, more important than their interest rates, is the amount of long-term credit that they provide as any private banks do. For that reason, in cases where stock markets are small and underdeveloped, only the State can accommodate the long-run credit demand. For example, it would be difficult to explain the Chinese economic growth without the existence of China’s public banks or the interaction between public investment and financial policy.

For that reason, one could argue that another type of “financial repression” occurs, in fact, when the financial system is exclusively based on commercial banks, because banks cannot be financial agents of economic development under prudential leverage ratios.

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See also:

Capital controls; Corridor and floor systems; Endogenous money; Lender of last resort; Natural rate of interest; Reserve requirements; Wicksell, Knut.

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Financial supervision

Financial supervision is a basic tenet of a resilient financial system. Supervising the various components that make up the financial system – to wit, financial institutions, markets, and infrastructures – is indeed a critical precondition for the implementation of a consistent framework for financial regulation aimed at enhancing the resilience of the financial system as a whole. Against this backdrop, financial supervision and financial regulation are intimately related. Beyond identifying and assessing emerging risk to financial stability stemming from the macroeconomic and financial environment (through macro stress tests, for instance), supervisory authorities must continuously monitor that the regulatory framework in place provides an even playing field for financial institutions and that, accordingly, it does not prompt the latter to shift their activities to other less or non-regulated segments of the financial system (the so-called “boundary problem in financial regulation”; see Goodhart, 2008, pp.48–50).

Broadly speaking, the onset of the 2008–09 global financial crisis has brought about two major changes in the scope and architecture of financial supervision. The first change relates to the shift from a micro-prudential to a system-wide, macro-prudential approach to financial supervision and regulation, focused on the stability of the financial system as a whole and its linkages with the “real side” of the economy. As a matter of fact, the pre-crisis financial supervisory framework was overly focused on supervising financial institutions (mainly banks) on a stand-alone basis to enhance their safety and soundness and, eventually, limit the risk of their failure. Yet too little emphasis was put on the supervision of financial players performing bank-like activities but falling outside the perimeter of the traditional banking system – so-called “shadow banking” financial intermediaries – whose relevance in the global financial landscape has increased dramatically since the 1980s, ending up being at the epicentre of the 2008–09 financial crisis. By the same token, supervisory authorities paid little or no attention to the endogenous nature of systemic risk with regard to the collective behaviour of financial institutions – a shortcoming addressed by macro-prudential supervision (Borio, 2011).

The second change, closely connected to the first, pertains to the transition currently under way in the institutional architecture of existing financial supervisory frameworks. In this regard, a tendency towards consolidation (integration) of financial supervisory powers has gained prominence following the 2008–09 financial crisis. Supervisory powers that were heretofore exercised by a constellation of functionally and institutionally specialized authorities are now being put into the hands of a restricted number of supervisory authorities – in accordance with a kind of “integrated approach to financial supervision” (Group of Thirty, 2008, p.36). Against this backdrop, central banks have been called upon to play a leading role in the supervision of the whole financial system. They have been entrusted with the task of carrying out macroprudential supervision (jointly with other newly created authorities) and also of supervising large and complex systemically important financial institutions. In the euro area, for instance, while micro-prudential supervision remains, to date, outside the scope of the European Central

Bank's (ECB's) tasks and is carried out by the European Supervisory Authorities (ESAs) jointly with national authorities, macro-prudential supervision has been delegated to the European Systemic Risk Board (ESRB) – chaired by the president of the ECB. Moreover, the effort to create a European banking union – designed to break the negative feedback loop between banks and sovereign debt – has recently led the European Commission to support the establishment of a Single Supervisory Mechanism (SSM) for banks, to become effective in 2014, which entrusts the ECB with the additional task of supervising systemically important European banks on a micro-prudential basis. The integration of micro-prudential supervision into the realm of the ECB, however, stands in glaring contrast with the recommendations of the de Larosière report – one of the most important contributions for reforming the European (and international) financial architecture – according to which adding micro-supervisory duties to the ECB “could impinge on its fundamental mandate” of maintaining price stability (see Balcerowicz et al., 2009, p. 43).

Quite the same pattern is currently underway in the United States, where the Dodd–Frank Act has been enacted in response to the shortfalls of the pre-crisis supervisory framework, mainly because of its highly fragmented structure and lack of macro-prudential supervision. The Financial Services Oversight Council (FSOC) has been charged with macro-prudential oversight of the US financial system, while the US Federal Reserve has been endowed with the responsibility of supervising bank holding companies with total consolidated assets of 50 billion US dollars or more and other systemically important (non-bank) financial institutions and financial market utilities.

Now, consolidating the conduct of monetary policy and micro-prudential and macro-prudential supervisory powers under the roof of the central bank increases the danger that “the pendulum may well have swung too far” (Friedman, 1968, p. 5). To put it bluntly, there is actually a risk of overburdening central banks with too many tasks and responsibilities (other than monetary stability) that they are not able to perform. In this respect, the potential conflicts arising from the interplay of these three broad areas of responsibility within the same institution must not be underestimated. Another concern is that financial supervision remains, to date, overly focused on supervising individual financial (especially banking) institutions, thereby overlooking other non-bank players in the financial landscape that also pose a threat to systemic financial stability. Overcoming this deficiency is especially critical in those financial systems, such as the US system, where a large fraction of financial intermediation occurs through capital markets rather than through regulated banks.

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See also:

Financial crisis; Financial instability; Macro-prudential policies; Shadow banking; Systemically important financial institutions.

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Financial transactions tax

A financial transactions tax (FTT) is a tax imposed on financial transactions. It is aimed at reducing the trade of short-term financial instruments that speculate on the demand price of capital assets to attain financial gains. The goal of the FTT is to lengthen the ownership of financial assets, to reduce both the volatility of their prices and financial instability in the whole economic system. It should be a small tax, with negligible burden on asset holders who provide liquidity to financial markets but that should increase transaction costs for investors who trade financial instruments for the sole purpose of making financial gains.

Speculation in financial markets is linked to non-ergodic systems, where an unknown and unpredictable future creates uncertainty with respect to prospective returns on investment. Such speculation is not neutralized by capital markets granting liquidity to non-liquid assets with the intention to calm down investors' "nerves and makes [them] much more willing to run a risk" (Keynes, 1936, p. 160). Indeed, Keynes's arguments are that the demand price of investment is based on psychological conventions, with no real anchors, subject to high volatility that induces a casino-type of activity with big financial gains (and losses), irrespective of economic fundamentals. This behaviour dominates in highly organized capital markets whose main characteristic is that financial transactions are almost costless.

In this framework, Keynes (1936, p. 160) argued that "[t]he introduction of a substantial government transfer tax on all transactions might prove the most serviceable reform available, with a view to mitigating the predominance of speculation over enterprise in the United States". Its objective is to make it less accessible and more expensive for the professional investors to trade financial instruments for the sake of price differentials. In other words, an FTT aims to curb financial speculation.

The huge financial imbalances resulting from the breakdown of the Bretton Woods regime in 1972–73 revived the debate over an FTT. Tobin (1974) suggested the adoption of a tax aimed at limiting speculative transactions on foreign-exchange markets (see Dimand and Dore, 2000, p. 516). Yet Tobin's proposal was different from Keynes's, as it affected all foreign-exchange transactions, ignoring the differences between speculative, trade and service flows, and concerned all types of financial instruments (*ibid.*, p. 518). Grabel (2003, p. 325), following Tobin's definition, referred to this tax as a "modest ad-valorem tax on all spot transactions in foreign exchange", which was amended by Tobin (1996, p. xv) to encompass forward and swap transactions as well.

Through history, there have been different versions of FTTs adopted by various countries. An FTT was first adopted in Britain in 1694 as a charging stamp duty on equity purchases, and, as recently as 14 February 2013, 11 European Union member countries announced the decision to impose an FTT on a variety of financial market transactions within and across their borders.

Mainstream economists oppose the FTT on the basis that speculation stabilizes financial markets, because it creates a process of riskless arbitrage that leads to the determination of the true prices of financial securities. This view was developed notably by Friedman (1953) and strengthened by the efficient-market hypothesis. Heterodox economists have criticized this position in various ways. Erturk (2006), for example, has questioned the existence of true prices and, more importantly, limitless arbitrage processes.

Heterodox economists, however, are not unified in their support of an FTT. For instance, Davidson (1997, 1998) argues that, rather than decreasing instability, an FTT *à la* Tobin amplifies it, by reducing financial deepness in the market. Grabel (2003) considers that it is not an effective means to reduce fragility risks, since the amount of an FTT is low in relation to the expected profits associated with financial speculation and it does not prevent herding behaviour. Particularly, an FTT is unable to raise transaction costs sufficiently without drying up financial market liquidity. Further, financial transactions are better explained in terms of bandwagon consensus or irrational exuberance, which can only be limited by market makers or directly through forbidding capital movements for speculative purposes. An FTT “may inflict greater damage on international trading in goods and services and service and arbitrage activities” (Davidson, 1998, p. 650) without affecting speculation.

Other heterodox economists reach an opposite conclusion. Arestis and Sawyer (1997) argue that higher volumes of financial transactions amplify and deepen capital markets as well as their volatility. Since an FTT increases their trade costs, it can partially curb speculation. As they explain, “in organized markets where transaction costs are minimal, the unknowability of the long-term future will cause speculation to dominate enterprise, and thickness of the market and volatility will both be effects of this. Thus the argument is not that one causes the other but that both are symptoms of pathological tendencies in financial markets” (ibid., p. 754).

More importantly, some economists argue that an FTT is a means of collecting significant government revenues, which is opposed by free-market economists and globalization-prone policy makers. Also, supporters of an FTT argue that the trading of financial assets does not directly increase the flows of goods and services, as such trading is a form of unproductive activity in the sense of Bhagwati (1982): financial transactions “may be privately profitable but do not directly increase the flow of goods and services” (Pollin et al., 2003, p. 530). In this respect, Erturk (2006, p. 76) argues that an FTT can “reduce the time horizon at which the price deviation begins to exert a negative influence on the elasticity of expectations and alters trade belief about risk characteristics of the market in which it is imposed”. Hence, an FTT can “slow down traders’ speed of reaction and lower their elasticity of future price reactions expectations with respect to current price changes” (ibid., p. 77), or can reduce speculation when the elasticity of expectations is greater than one. Arestis and Sawyer (1997, p. 760) maintain that “[a] rise in price generates a larger rise in expected price, leading to increased demand now in anticipation of higher future prices, thereby exacerbating the rise in price. [. . .] A transaction tax would be expected to reduce substantially short-term dealing”.

The FTT is a controversial issue even among those who argue that financial transactions are a source of profit, which does not provide finance for productive activities to increase real income. The question that has still to be addressed is whether an FTT can be converted into a device that would deter capital mobility. From the above arguments

it can be argued that a negligible tax rate will neither reduce speculation nor stabilize financial market transactions but definitively will force *rentiers* to part with a portion of their returns.

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See also:

Asset price inflation; Bretton Woods regime; Efficient markets theory; Financial crisis; Financial deregulation; Financial instability; Tobin tax.

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First and Second Banks of the United States

The United States is unique among Western industrializing nations in that it had no central banking institution during its initial period of sustained economic growth (1840–1910). It experimented with a form of central banking in its first 50 years of nationhood, but ultimately turned away from central banking in favour of a divorce between the central State and the banks and direct monetary stabilization by the Treasury.

Between 1790 and 1840, the US federal government chartered two banks, both called at the time the Bank of the United States, but subsequently differentiated, for the convenience of history, as the First and Second Banks of the United States. Both institutions were commercial banks chartered to address problems in public finance; both were the largest banks in the country and the only ones allowed to operate a national branch network; and both encountered political opposition to their charter renewal and closed after operating for 20 years. The First and Second Banks carved out a distinct niche in the US monetary system, supplying larger-denomination notes and drafts that circulated throughout the national economy and were regarded as equivalent to specie (gold and silver coins), the ultimate reserve and settlement asset at the time.

The First Bank of the United States (1791–1811) was the brainchild of the first US Secretary of the Treasury, Alexander Hamilton, and was one part of his plan for placing national finance on a sound foundation after the fiscally disastrous years of the Confederation (1783–89). Hamilton consolidated the Revolutionary War debt at the national-government level, converted it into British-style consols, and refunded it by reserving custom duties, the primary public revenue source formerly collected by the states, for the federal government.

The First Bank was designed to support this restructuring of the public debt in several ways. The government made its notes legal tender for federal revenue collections; collected customs duties through the Bank; kept its deposits with the Bank; transferred funds between cities through the Bank; and serviced its debt through the Bank (Wetteteau, 1937, pp. 270–72). The Bank was a success, commercially and in terms of performance of its public duties. But its bid to be rechartered still failed in Congress, with opponents arguing that the US Congress lacked the authority to charter a bank, and that the State-chartered banks could do everything the First Bank did, but even better.

The Second Bank was chartered in 1816, five years after the closure of the First Bank, during which time the US government had waged war against Great Britain without the benefit of a national bank. Ironically, some of the Second Bank's most ardent supporters in the US Congress were legislators who had opposed the rechartering of the First Bank. Like the First Bank, the Second Bank of the United States was a mixed enterprise in terms of ownership, and was closely tied in to the federal government's fiscal affairs in many of the same ways. After a rocky start, with weak leadership and macroeconomic instability, the Second Bank hit its stride under the presidency of Nicholas Biddle, who developed a new business model for the Bank based on a large-scale expansion of the Bank's operations in long-distance payments (Smith, 1953, pp. 99–146).

The Second Bank is perhaps best known for the “war” waged upon it by President Andrew Jackson (1829–37). The Bank won support for its charter renewal in both houses of the US Congress, but Jackson vetoed the bill to recharter, which was then upheld by Congress. Jackson believed that the Bank aspired to have more power than the presidency; his veto proved that it did not. It is generally thought that Jackson's populist rhetoric against the Bank secured his re-election in 1832, but that the economic effect of the demise of the Second Bank was the devolution of the “money power” to the state governments and their State-chartered banks (Hammond, 1957, pp. 443–5). A financial boom (1832–37) and bust (1837–42) followed the closure of the Second Bank, after which the US federal government pulled its funds out of banks and did its business on a specie basis (Knodell, 2006, pp. 547–69).

The First and Second Banks had an uneasy relationship *vis-à-vis* the State-chartered banks. They were simultaneously their regulators and their competitors. Because of their fiduciary obligations to their shareholders, the First and Second Banks had to put their own survival above that of their fellows during monetary crises, a trade-off that modern central banks never have to confront. State-chartered banking grew continuously during the period when the First and Second Banks operated. In 1791, there were only three State-chartered banks; 20 years later, there were over 100. By the time the Second Bank was chartered, there were 230 banks, and 20 years later, 460. State governments had an incentive to freely charter banks after they started taxing bank capital; additionally, they

secured preferential access to finance through charter provisions. Some, but not all, of the State-chartered banks became part of the coalitions that formed in opposition to these early proto-central banks.

The political and academic debates over the First and Second Banks have featured long-standing themes in US history about the role of government in the economy, the relationship between the government and financial institutions, and the right balance of power between the federal and state governments. Both Banks exerted a stabilizing influence over the economy and over their competitors, the state banks, without being full-blooded central banks. Both ultimately came to an early demise because of their privileges and close association with the central government.

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See also:

Biddle, Nicholas; Federal Reserve System; Settlement balances.

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Fisher effect

The Theory of Interest (Fisher, 1930) is grounded in neoclassical economic thought. According to Fisher (*ibid.*, p. 495), the interest rate is determined by three conditions: (i) market equilibrium; (ii) "at the margin of choice", the equalization of the rate of time preference with the market interest rate; and (iii) the equalization of the "rate of return over the cost" with the market interest rate. The equilibrium interest rate is therefore determined by real (non-monetary) variables: the rate of time preference that determines savings (an upward-sloping function), and the marginal return on investment that determines the demand for loans (a downward-sloping function).

Fisher (*ibid.*) argued that, in the absence of inflation (that is, a situation with a "stable purchasing power of money" in Fisher's own words), the nominal rate of interest and the real rate of interest would be the same according to his theory, while changes in the purchasing power of money would involve a discrepancy between these two rates. This is because inflation, provided that it is foreseen, increases the return on investment, thereby increasing the number of transactions and pushing investors to increase the demand for loans until the nominal interest-rate increase equals the rate of change in the price of transactions.

Fisher (*ibid.*, pp. 493–4) insisted that this "perfect theoretical adjustment" is an approximation of what happens in the real world, where "the appreciation or depreciation of the monetary standard does produce a real effect on the rate of interest [. . .]. This effect is due to the fact that the money rate of interest, while it does change somewhat

according to the theory [. . .] does not usually change enough to fully compensate for the appreciation or depreciation". However, Fisher considered that the imperfect adjustment of the money rate of interest was a short-run phenomenon, owing to some lag in the real-world adjustment process ("money illusion" was assumed to play a crucial role in this respect). In the long run, changes in the purchasing power of money should lead to a proportional change in the money rate of interest, without a substantial effect on the real rate of interest: "the results and other evidence, indicate that, over long periods at least, interest rates follow price movements. [. . .] Our investigations thus corroborate convincingly the theory that a direct relation exists between $P\dot{c}$ [the change in price] and i , the price changes usually preceding and determining like changes in interest rates" (ibid., p. 425).

The Theory of Interest was actually presented under three "approximations" of increasing complexity: (i) assuming that each person's "income stream [is] foreknown and unchangeable" (except by loans, which means that there are no investment opportunities); (ii) assuming that income streams are modifiable by loans and other means (investment opportunities); and (iii) assuming that income streams are uncertain.

The great shortcoming of the first and second approximations, from the standpoint of real life, is the complete ruling out of uncertainty. This exclusion of the risk element was made in order to make the exposition simpler and to focus the reader's attention on the factors most relevant to the theory of interest. But in real life the most conspicuous characteristic of the future is in its uncertainty. Consequently, the introduction of the element of chance, or risk, will at once endow our hypothetical picture with the aspect of reality. (Fisher, 1930, p. 206)

Fisher (ibid.) was therefore conscious that uncertainty interferes strongly with the determination of the rate of interest in the real world, but, owing to his fascination with mathematics and to the quantitative relations he was seeking, he considered uncertainty a mere empirical perturbation that theory should disregard:

In the economic universe, as in astronomy, every star reacts on every other. From a practical point of view we cannot ignore the many perturbations. But from the theoretical point of view we gain clearness, simplicity and beauty, if we allow ourselves to assume certain other things equal, and confine our laws to a little part of the whole, such as the solar system. From such a point of view, the second approximation is the most instructive, rather than the first which rules out the important element of investment opportunity, or than the third which becomes too complicated and vague for any complete theoretical treatment. (Fisher, 1930, p. 497)

Obviously, Fisher's methodological choice has a tremendous impact on the realism of both his theory of interest and his analysis of the effect of an expected inflation rate on both real and nominal rates of interest. It was Keynes who, in 1936, proposed a "general theory" that fully considered the effects of uncertainty on interest rates. This gave rise to the post-Keynesian approach to endogenous money, where (expected or unexpected) inflation involves higher costs of production and therefore a proportional change in the demand for credit. This gives rise to an endogenous proportional change in the credit-money supplied by banks (the causality running from prices to credit-money, not the reverse). As a result, inflation has no effect on the equilibrium rate of interest, unless

monetary authorities fight inflation by means of an increase in their policy rates of interest, as embedded in the Taylor rule and in inflation targeting policies. This is an important conclusion, because if the Fisher effect were observed empirically (see, however, Lavoie and Seccareccia, 2004, pp. 171–7), it would not result from Fisher's theorem, but from the willingness of monetary authorities to manage the rate of interest in order to keep inflation expectations under control. Against this kind of monetary policy, Keynes pointed out the positive effects that an expected rate of inflation entails on the inducement to invest, and, thereby, on effective demand:

The stimulating effect of the expectation of higher prices is due, not to its raising the rate of interest [. . .], but to its raising the marginal efficiency of a given stock of capital. (Keynes, 1936, pp. 142–3)

This suggests that, at least in an underemployment situation, expectations of higher prices could actually stimulate the economy instead of increasing its rates of interest.

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See also:

Classical dichotomy; Endogenous money; Inflation targeting; Money illusion; Taylor rule.

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Flow of funds

The flow of funds (or financial account) is a system of accounting that records all financial transactions of an economy. Bookkeeping both the financial stocks and flows, it tracks the sources and uses of funds for each institutional sector and for the economy as a whole. The flow of funds is one of the key instruments in national accounting together with the national income and product account, the national balance sheet, and the input–output matrix. It is one of the primary components of the System of National Accounts (SNA) of the United Nations. First published in 1953, the flow of funds was incorporated within the SNA in 1968.

The flow-of-funds approach stems from the work of Morris Copeland, an American institutionalist economist who worked at the US Federal Reserve. The intuition of Copeland was to enlarge the social accounting perspective (which had been until then used mainly in the study of national income) to the study of money flows. Hence, with his attempts to find answers to fundamental economic questions such as “when total purchases of our national product increase, where does the money come from to finance them” and “when purchases of our national product decline, what becomes of the money that is not spent”, he laid the foundation of this accounting approach (Copeland, 1949, p. 254). A concrete example of his legacy is represented by the quadruple-entry system.

Since one sector's inflow is another sector's outflow, the standard double-entry principle applied at an aggregated level doubles into a quadruple-entry system.

The work of Copeland was immediately capitalized by the US Federal Reserve System, which in 1951 started publishing its "money flows", whose name was changed in 1955 to "flow of funds" (Vanoli, 2005). The diffusion of this innovation was prompt (as it was adopted in 1958 by the Bank of Japan and in 1959 by the Reserve Bank of India) and continues to this day (for instance, it was adopted by Brazil in 1985, by China in 1986, and by the euro area in 2001).

While the work of Copeland had tremendous implications for statisticians and public institutions such as central banks and national statistical offices, the usage of the generated data to elaborate on economic theory was rather scarce within the academic community. As noted by Cohen (1972), the potential disruptive impact on the study and modelling of the interdependences between real and financial flows failed to occur. Cohen (*ibid.*, p. 13) points to "the lack of a so-called 'organizing theory'" as one of the possible causes of such a drawback. Dawson (1996, p. 89) blames the direction along which economic theory has evolved: "a new kind of division of labor seems to have developed between those who seek to make empirical forecasts of aggregate economic activity and those who seek to build neat, deterministic macromodels in which economic behavior is specified in terms of utility and profit maximization [. . .]. These latter models tend to be more concerned with Walras's Law than with social accounting equations". This different focus (which appears at best myopic in light of the global financial crisis that occurred in 2008–09) finds its justification in the Modigliani–Miller (1958) theorem, as it basically negates part of Copeland's work.

There are, however, a few notable exceptions of authors elaborating models on stocks and flows. For example, Denizet (1967) based his analysis on a framework similar to the post-Keynesian stock-and-flows consistent methodological approach, which provides "a transactions flow matrix that has implicitly all the features of the matrices that were later produced explicitly by Tobin [. . .] and systematically by Godley" (Lavoie, 2014, p. 4). Turnovsky (1977) tried to include financial markets in the standard IS–LM framework, expanding the work of previous authors, such as May (1970) on continuous and discrete time in the analysis of stocks and flows, and Meyer (1975) on the coherence between stocks and flows ("conservation principle").

In the 1980s, two economists started using the flow-of-funds data with a theoretical purpose. On the one hand, James Tobin (see notably Backus et al., 1980; Tobin, 1982) concentrated his analysis on the portfolio choice of households and in doing so highlighted feedbacks between financial and real flows. On the other hand, Wynne Godley focused more broadly on national accounts. Not only did he manage to observe troublesome dynamics (see Godley, 1999) but he also developed a branch of models that integrated stocks and flows in a consistent manner (see Godley and Cripps, 1983).

The fact is that, notwithstanding Tobin and Godley's work, the flow-of-funds approach to economic modelling remained (and is still) marginal within economic literature. The financial and economic crisis that occurred in 2008–09, however, has shed light again on the financial sector, inducing some central banks to look again at the information contained in the flow of funds (see Bê Duc and Le Breton, 2009; Barwell and Burrows, 2011).

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See also:

Federal Reserve System; Financial crisis; Modigliani–Miller theorem.

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Forward guidance

The term “forward guidance” refers to a central bank’s public announcements about the likely future path of its short-term interest rates. Such announcements are made with the intention of affecting long-term interest rates by influencing the expected short-term rates (spot rates) at given maturities along the yield curve.

Forward guidance provides economic agents with an indication of the likely future level of the short-term rate of interest (the federal funds rate in the United States), which the central bank controls directly. This, in turn, allows these agents to form expectations of the rate of interest at which banks will be able to borrow overnight funds from the central bank in the future. Qualitative forward guidance aims to steer interest rate expectations by, for example, providing likely triggers or thresholds to interest rate moves, often the emergence of specific economic conditions. Quantitative forward guidance offers explicit numeric forecasts of interest rates for a given number of periods into the future. The US Federal Reserve moved from qualitative to quantitative forward guidance in December 2012, when it indicated that the prevailing federal funds rate of 0–¼ per cent would be maintained at that level as long as the unemployment rate exceeded 6½ per cent and one- to two-year inflation projections remained below 2½ percentage points.

The theoretical foundation of forward guidance lies in the expectations hypothesis of the term structure of interest rates, which posits that the long-term rate of interest is determined by the market expectations for short-term interest rates over the given investment horizon plus a risk premium. However, empirical studies challenge this theory, showing that while long-term rates of interest reflect the market's expectations of future short-term interest rates, actual future interest rates follow a random walk and are thus essentially unpredictable (Guidolin and Thornton, 2008).

Advocates of forward guidance promote the view that transparency improves efficiency of central bank policy. At the root of this argument is the idea of optimal monetary policy inertia, which states that small but persistent alterations in the short-term interest rate – rather than less predictable, more drastic adjustments of this rate in response to changes in economic conditions – permit the monetary authorities to exert a greater influence on long-term policy rates of interest and thus on total demand (Woodford, 1999).

The theoretical transmission channels of this monetary policy tool may be conflicting. Indeed, a central bank announcement of low future rates of interest may be interpreted by economic agents as a commitment to continued monetary stimulus, arguably associated with higher expected future inflation rates and hence lower expected real interest rates, leading to increased aggregate demand (Eggertsson and Woodford, 2003). Even in the absence of expectations for higher future inflation rates related to monetary stimulus, which is both theoretically and empirically questionable, economic activity may be boosted by the perception of improved future economic prospects, supported by accommodative monetary policy. Alternatively, the same announcement may be interpreted as negative news on the state of the economy, based on information exclusively available to the central bank (Del Negro et al., 2012).

Forward guidance may thus be used for two distinct purposes, namely as a means of commitment to a specified path of interest rates or as a means of sharing information. In the case of the former, the gains from this policy instrument depend on the losses that are associated with the surrender of future flexibility and the costs of deviation from prior commitments. The optimal degree of commitment is likely to be variable over time and dependent on the particular economic and financial environment in which a central bank operates (Gersbach and Hahn, 2008). The costs of deviation are associated with the loss of central bank credibility, which may influence the future effectiveness of forward guidance and raise questions regarding the central bank's competence, whereas the surrender of flexibility may be problematic in the case of unexpected changes in macroeconomic conditions. Gersbach and Hahn (ibid.) question the usefulness of forward guidance as a method for sharing information, because a central bank is unlikely to issue forward guidance that reflects expected future economic or financial turbulence, and thus suffers from a credibility constraint.

Forward guidance may also have the negative impact of diverting market expectations from fundamentals and weakening the market's forecast capacity. Economic agents may overreact to public information at the expense of private information (Morris and Shin, 2002). Forward guidance announcements may also be misinterpreted. On 17 June 2013, when the US Federal Reserve Chairman Ben Bernanke announced that the Federal Reserve would begin "tapering" its asset-purchase programme around mid 2014, the news was interpreted as an implicit promise of tightening, which resulted in a sharp rise

in interest rates at the long end of the yield curve (Harding and Politi, 2013). The breakdown of traditional transmission mechanisms of monetary policy, most notably in the United States, puts in question the ability of the central bank to make accurate projections of economic activity that justify its forward guidance, as such projections are made on the assumption that the expanding monetary policy toolkit will permit the central bank to effectively achieve its objectives.

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See also:

Bank of England; Bernanke, Ben Shalom; Carney, Mark; Central bank credibility; Effective lower bound; Federal Open Market Committee; Monetary policy transmission channels; Random walk; Time inconsistency; Yield curve.

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Fractional reserve banking

The expression “fractional reserve banking” describes a banking system where a particular bank’s liability, namely deposits, is used as means of payment. Deposits become means of payment when they are made transferable, either by cheque or by note, which is a cheque payable to the bearer without reference to the depositor against whose deposit it was originally issued. In this system we can distinguish two kinds of money: (i) legal money, issued by the central bank and held by both banks and non-bank agents as reserves, which are known as “narrow money”, “high-powered money” or “monetary base”; and (ii) bank deposits, that is, bank money. The sum of these types of money is called “broad money”.

The concept of the money multiplier makes it possible to define the link between “narrow money” and “broad money”. Orthodox economists assume that the process begins when, for instance, 100 euros of monetary base, issued by the central bank, are deposited into Bank A. Bank A is not required to create a reserve of 100 euros, as happens in a full-reserve system, but can choose to establish a reserve equal to a fraction k of deposits, for example equal to 10 per cent of deposits. Then Bank A can lend out the remaining 90 euros. The loan recipient soon spends these 90 euros, and we can assume that the receiver of this amount deposits it to Bank B. Bank B is now in the same

situation as Bank A: it sets aside 10 per cent of these 90 euros as reserves and lends out the remaining 81 euros. The process continues until the entire new monetary base will be used by banks to increase their reserves. As reserves correspond to 10 per cent of bank deposits, the maximum amount of deposits that can result from the initial creation of monetary base equal to 100 euros, corresponds to 1000 euros. Denoting by D the amount of deposits, by k the banks' rate of reserves, and by BM the monetary base, we obtain the following equation:

$$D = (1/k) BM$$

The expression $1/k$ is called the "money multiplier": it calculates the maximum amount of bank deposits that corresponds to a new unit of monetary base, given a reserve ratio equal to k (see Realforzo, 1998 for an analysis of the development of the theory of bank deposit multipliers).

Orthodox economists believe that central banks can control the quantity of bank deposits by managing the monetary base and that the money multiplier does not change the nature of banks. Cannan (1921, p. 31), for example, points out that banks do not create money but are intermediaries that lend what they collect: "If the total of bank deposits is three times as great as the total of coins and notes in existence we need no more suppose that the banks have 'created money'".

The analysis of heterodox economists is different. Schumpeter (1954, p. 1114), for instance, criticizes Cannan by stressing that banks create money when they receive a deposit, because they give the depositors an asset that "though legally only a claim to legal-tender money, serves within very wide limits the same purposes that this money itself would serve". This implies that depositors "lend nothing in the sense of giving up the use of their money. They continue to spend, paying by check instead of by coin. And while they go on spending just as if they had kept their coins, the borrowers likewise spend the same money at the same time" (ibid., p. 1114). Further, banks can create money when they grant a loan: in fact, they do not have to lend out legal-tender money. Against the obligation of the borrower, they can supply deposits: that is, an obligation of their own which is transferable by cheque. Schumpeter (ibid., p. 1114) concludes that the relationship between deposits and loans described by orthodox theory should be inverted: "It is much more realistic to say that banks 'create credit', that is, that they create deposits in their act of lending, than to say that they lend the deposits that have been entrusted to them."

The traditional Keynesian theory has not given particular attention to this point: Tobin, for example, developed a theory of financial intermediaries that neglected the banks' ability to create money (see Bertocco, 2011). On the other hand, this point is the core of endogenous money theory, elaborated by post-Keynesians, who invert the causal relationship between deposits and monetary base compared with orthodox theory (see Bertocco, 2010). The supporters of the loanable funds theory, too, following Wicksell's lesson, recognize the banks' capacity to create money, but they conclude that this fact does not modify the structure of the economic system with respect to an economy without banks. In order to challenge the loanable funds theory, which can be considered as the theoretical foundation of the mainstream, the main task of post-Keynesians is to explain why bank money is the crucial element to describe what

Keynes defined as a “monetary economy”; that is, an economic system where the presence of money radically changes the features of the production process (see Bertocco, 2013a, 2013b).

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See also:

100% money; Bank deposits; Central bank money; Chicago Plan; Endogenous money; High-powered money; Monetary circuit; Money and credit; Money multiplier; Reserve requirements.

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Free banking

The term “free banking” is generally used to describe a structure of the credit market based on the principle of *laissez-faire* and characterized by the absence of entry and exit barriers, freedom of monetary issue and the possibility of unrestricted lending and borrowing.

The best-known examples of free banking are those observed in Scotland (from the end of the monopoly of the Scottish Bank to the Peel Act) and in the United States (between 1837 and 1863).

One of the principal supporters of a free banking regime was Mises, whose theories were adopted (and further developed) by the Austrian School. He declared his approval for free banking while recognizing its limitations. In his view, acceptance of a liberalized banking activity did not imply abolition of every form of control over monetary issue: his awareness that banks could issue money without any limit led him to turn his attention to an integral gold monetary system (see Mises, 1949).

A return to free banking was also recommended by Hayek (1976), who suggested giving freedom of issue back to commercial banks. The role of banks would thus be purely that of intermediaries between depositors and borrowers. Although Hayek’s analysis, unlike Mises’, did not focus on the difference between the monetary function and the credit function of the banking system, it had the merit of underlining the substantially equivalent role of commercial banks and the central bank on the question of monetary issue.

A third approach, New Monetary Economics (see Cowen and Kroszner, 1987), is based on the studies of Black (1970), Fama (1980) and Hall (1982). This identifies elements in

the recent economic and financial crisis, and in the evolution of the payments system, to justify the return to a regime of free banking. In light of the global financial crisis that erupted in 2008, Dowd (2009, p.9) further recommended free banking “anchored on a commodity-based monetary standard”. This brought to light the metallist vision often underlying the proposals of those in favour of a free banking system.

Finally, Selgin and White (1994) underlined the view of free banking as a system of free competitive monetary issue by private banks, regulated by clauses to guarantee convertibility. In line with the supporters of the Banking School, they maintained that the law of reflux protected the system from the risk of overissue. They too observed that the information revolution tended inevitably towards a regime of monetary issue free from external control, and that technological development, together with privatization in the creation of means of payment, could only result in an advantage for the economic system, reducing the issuing profits of the central banks (see Selgin and White, 2002).

In the debate on free banking, one of the topics under discussion was the possibility that such a regime could lead to situations of instability at a systemic level (see Dow, 1996). But the basic disadvantage of the hypothesis of a return to free banking is that its theoretical reference model, of a monetized exchange economy, enables it to carry out the functions of a barter economy but not of a capitalist economy (see Graziani, 2003). It should be noted that Menger’s approach, in line with this hypothesis, does not consider the role of money as a social relation (see Ingham, 2000) or its decisive role in the economic system.

In this respect, monetary circuit theory underlines how the role of the banking system should be defined in light of the workings of a monetary production economy, which characterizes a capitalist system. This would lead to a new financial architecture at both national and international levels, guaranteeing stability and economic growth (see Rochon and Rossi, 2007).

The proposal of the Dijon School in this respect is based on the fundamental distinction between money, income and capital (see Schmitt, 1984). This gives rise to a subdivision of the banking system into three departments (monetary, financial and fixed-capital), their inflows and outflows booked according to the nature of the underlying payment (see Rossi, 2010).

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See also:

Banking and Currency Schools; Financial crisis; Financial instability; Hayek, Friedrich Augustus von; Metallism; Monetary circuit; Money and credit; Reflux mechanism; Settlement system.

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Friedman rule

There is some terminological variety, and hence confusion, in the academic literature and the economics profession regarding "the Friedman rule", which should rather read "the Friedman rules". Indeed, there are at least three distinct meanings, or versions, of what has been referred to as the "Friedman rule" (or "Friedman's rule"). These three versions basically correspond to the evolution of Milton Friedman's own ideas on the appropriate rules to govern monetary (and fiscal) policy. He himself admits the contradictory prescriptions to policy makers embodied in his earlier and later work, for instance in the heading and content of his concluding section, "A final schizophrenic note", of one of his major essays (Friedman, 1969, pp.47–8).

To clarify this conceptual confusion, I denote the three rules Friedman has recommended at different stages of his scholarship as follows: (i) "first Friedman rule", or "exogenous bond (stock) growth rule", or "original Friedman rule" (Friedman, 1948); (ii) "second Friedman rule", or "constant (k per cent) money (stock) growth rule", or "monetarist rule" (Friedman, 1960); (iii) "third Friedman rule", or "Friedman rule for the optimum quantity of money", or "final Friedman rule" (Friedman, 1969). I next summarize these rules in reverse chronological order – equivalently, also in decreasing order of their perceived importance in the subsequent theoretical monetary literature – with minimal reference to studies confirming or challenging them.

Friedman states his third rule as follows: "Our *final rule for the optimum quantity of money is that it will be attained by a rate of price deflation that makes the nominal rate of interest equal to zero*" (Friedman, 1969, p.34, italics in original). He originally formulated this rule in a model of a "hypothetical simple society" based on 13 listed assumptions (*ibid.*, pp.2–3). But the rule has more generally emerged as a rather robust result in a core literature on monetary economics that could be denoted as "theory of monetary policy". It assigns to the optimal (monetary–fiscal) policy the equalization of the return on money and other assets by setting the nominal interest

rate to zero and aiming at a mild deflation, thus guaranteeing a positive real interest rate. This third Friedman rule has subsequently been derived in various environments of a specific class of general equilibrium macroeconomic models where certain frictions (also known as “shortcuts”) rationalize a positive value of money (see Arestis and Mihailov, 2011, for a survey). Most commonly, either transaction-technology costs have been invoked, such as a “cash-in-advance” (CiA) constraint (Clower, 1967), or real money balances have directly been embedded in the utility function (“money-in-the-utility-function” (MiUF) approach) (Sidrauski, 1967). The early CiA or overlapping-generations (OLG) set-ups with money assume only net lump-sum transfers (or taxes) available as “the policy instrument” and find this Friedman rule Pareto optimal. Phelps (1973) noted, though, that its optimality may hinge exactly on this restrictive assumption. Chari et al. (1996) show that it remains optimal in extensions allowing for distortionary taxes in the absence of lump-sum transfers. Assuming full commitment under a benevolent social planner and sticky prices, Khan et al. (2003) find support for the Friedman prescription of deflation, but with a low positive nominal interest rate because of price rigidity. More recently, da Costa and Werning (2008) show that the optimum quantity Friedman rule is Pareto efficient when combined with a non-decreasing labour income tax in an economy with heterogeneous agents subject to nonlinear taxation of labour income.

Nevertheless, the third Friedman rule has not been uncontroversial (see Bewley, 1980; Woodford, 1990). Positive inflation is found optimal by Weiss (1980) but zero inflation by Freeman (1993) in similar OLG set-ups. Last but not least, the optimum quantity Friedman rule has remained just a theoretical curiosity. Central bankers have never embraced it, by achieving a weak deflation on average, in their real-world monetary policies. The diversity of results on it is due to the differences implied by key model assumptions, for instance between infinitely-lived representative agent (ILRA) and OLG set-ups, as well as between CiA and MiUF assumptions (Gahvari, 2007).

The second Friedman rule has been at the centre of monetarism. However, Brunner and Meltzer, the other two major figures within this school of thought, have not always been affirmative of a constant (say, 2, or 5, or k per cent per year) growth rate for the money stock, or money supply (Nelson, 2008). In Friedman’s words, this second rule is defined as “increasing the quantity of money at a steady rate designed to keep final product prices constant, a rate I have estimated to be something like 4 to 5 per cent per year for the U.S. for a monetary total defined to include currency outside of banks and all deposits of commercial banks, demand and time” (Friedman, 1969, p. 47). Friedman’s main justification for such a k per cent rule is to induce stability in the business cycle by the predictability of monetary policy.

Such an idea, however, obviously ignores any feedback to the state of the economy, and has naturally been criticized both within mainstream monetary policy theory (see, for instance, McCallum, 1981, and the well-known New Keynesian literature) and heterodox approaches (see Davidson, 1972; Moore, 1988; Rochon and Vernengo, 2003). In the mainstream, monetary policy reaction functions include a systematic (deterministic or feedback) component as well as a monetary shock (stochastic or money surprise) component. Beyond the closed-loop, mathematically solvable systems describing a macroeconomic model in the mainstream, heterodox approaches commonly stress “endogenous money” arising from the needs of the economy, with the central bank

accommodating money and credit demand within the limitations of its objectives. The heterodox approaches highlight, in essence, the role of “inside money” created by the banking system and financial instability in the macroeconomy from an evolutionary, open-ended perspective that is less technical but arguably more general. Whereas the k per cent rule has led to theories and central bank practices of monetary targeting in the 1970s and 1980s, though with changing targets for the money growth on a yearly or quarterly basis, these have been replaced gradually over the 1990s and the 2000s with explicit or implicit inflation targeting strategies.

The original, first, Friedman rule envisaged bond – not money – stock growth to be exogenous to cyclical economic activity (McCallum, 1981). It has rarely been mentioned, though, in the subsequent literature, and has stayed far from the overwhelming influence in monetary policy debates in academia and central banks that the other two Friedman rule versions have enjoyed. While McCallum (1981) does not see much merit in the constant money growth, monetarist rule of Friedman, he considers the original rule worth further investigation.

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See also:

Endogenous money; Inflation targeting; Monetarism; Monetary targeting; Money supply; Rules versus discretion.

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G

Gibson's paradox

The Gibson paradox is the positive correlation between the long-run rate of interest and the price level. As observed by Tooke (1838, 1844), who by this time had become the main representative of the Banking School in opposition to the Currency School in the nineteenth century in England, “[a] higher rate of interest, in consequence of the absorption by the war loans of a considerable proportion of the savings of individuals; such higher rate of interest constituting an increased cost of production” (Tooke, 1838, p. 347).

Wicksell (1898 [1985], p. 69) emphasized the relevance of Tooke as an economist “equipped with an infinite amount of practical experience and unhampered by any very great theoretical ballast”. After Tooke, only Wicksell realized the positive impact of lasting changes in the rate of interest on money and prices. His explanation, based on the marginalist theory of prices and distribution, is grounded in the variation of a non-observable natural rate of interest as a guide of money rates of interest. Obviously, the above-mentioned variation is inferred from the change in the money rate of interest, which is clearly observable.

According to this view, the natural rate of interest is set by real capital supply and demand, whereas the actual money rate of interest, lately adapted by the central bank, follows the natural rate of interest with a delay. Changes in prices are induced by the difference between both rates of interest: if the natural rate of interest is higher (lower) than the money rate of interest, price variation will be positive (negative). In this way, lasting changes in the money rate of interest can be observed as part of the normal price of production of a commodity (Wicksell, 1898 [1985], p. 85).

Later, Keynes (1930, p. 198) called this relationship “Gibson's paradox” because, according to the marginalist theory, the correlation between interest rates and prices is negative: the higher the interest rate, the lower the level of investment, therefore a minor investment level would imply a lower pressure on prices. Keynes (*ibid.*, p. 198) added that “it is one of the most completely established empirical facts within the whole field of quantitative economics though theoretical economists have mostly ignored it”.

In fact, based on Gibson's (1923, 1926) notes, Keynes (1930, pp. 198–288) seemed to change his mind about the sign of the correlation between interest rates and prices, but his interpretation of the Gibson paradox remained within the marginalist mainstream, which considers that prices go up when the money rate of interest is below the natural rate of interest, inducing an increase in the former rate.

Gibson's notes suggested that the gold standard had little to do with generating this positive correlation, as put forward by Barsky and Summers (1988). Indeed, Keynes (1930, p. 199) himself showed that during a 137-year period the gold standard was suspended for 32 years (from 1797 to 1821, and after 1914) but nothing seemed to disrupt the continuity of the positive correlation between interest rates and the price level.

More recently, Pivetti's (1991) classical interpretation of Tooke's view – within the Sraffa framework – restores Tooke's original position, taking as given the techniques of production and the money interest rate (and not the techniques of production and

the wage rate). According to Pivetti (1998, p. 43), “there is nothing ‘paradoxical’ in the positive correlation between interest [rates] and the price level”.

The logic of that correlation is a cost-push channel of monetary policy, where the rate of interest plays a role in the cost of opportunity for firms to invest and it affects their cost of production and pricing decisions.

Many empirical models have been proposed to understand the impact of interest rates on marginal costs. For instance, Klein (1995) showed supporting evidence for US data; Barth and Ramey (2001) provided the same evidence using US data for 1960–96, showing that after a restrictive monetary policy shock, the price–wage ratio increases. In a similar vein, Hanson (2004) finds evidence of a price puzzle from 1959 to 1979.

Other denominations of Gibson’s paradox are “the Cavallo–Patman effect” (Taylor, 1991) and “the price puzzle” (Eichenbaum, 1992).

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See also:

Banking and Currency Schools; Natural rate of interest; Wicksell, Knut.

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Glass–Steagall Act

The expression “Glass–Steagall Act” is commonly used to refer to the provisions of the US Banking Act of 1933, relating to the separation between commercial banks and investment banks (see Norton, 1987).

Although they have been only partially implemented, the Glass–Steagall Act limitations to commercial banks’ involvement in security activities had a profound and

long-lasting influence on banking in the United States. With the Great Depression of the 1930s, the share of corporate securities in commercial bank security portfolios shrank considerably, and in the following decades never returned to its pre-1929 levels. The share of government securities grew correspondingly. The Glass–Steagall Act is considered to be the main determinant of this trend, even more than the Great Depression and the enormous increase in the issuance of government bonds needed to finance the Second World War – indeed, it is the only one of these three factors whose influence was not of a temporary nature (see Ramirez and DeLong, 2001, pp. 97–101).

The effects of the Glass–Steagall Act on the business of investment banking were also relevant. Before the reform, investment banks and commercial banks constituted financial conglomerates, owned by the same financiers and run by the same directors: the huge pool of deposits was thus enslaved to the needs of investment banking, making commercial banks the passive underwriters of the securities to be placed, and allowing investment banks to cash disproportionately high fees without bearing any risk. After the reform, investment bankers had to “organize” themselves the money in order to carry the securities, and then find non-bank long-term investors willing to buy them (see Carosso, 1970, pp. 427–32).

The Glass–Steagall Act had as its main purpose to prevent commercial banks from entering the capital market: public authorities – through deposit insurance and access to the lender of last resort – accorded commercial banks the privilege to operate the transformation of a short-term riskless funding into longer-term risky loans. In no event would this privilege be used to purchase securities, thus fanning the flames of financial speculation.

The end of the arrangement given to US banking by the Glass–Steagall Act dates back to long before the formal repeal of that Act in 1999 (see Barth et al., 2000). Since the 1970s, a new and growing wave of unchecked developments of financial transactions channelled short-term liquid loans into capital markets, in a way, however, different from that of the pre-Glass–Steagall Act era. The link between the money market and the capital market has not been recreated through the practice of the interlocking banking managements and the commercial bank subscription of bonds and stocks, but rather through the development of money market instruments alternative to deposits. Investment banking has become a highly leveraged business financed in a completely unregulated money market – the so-called shadow banking system – dominated by financial institutions without banking licences, which carried out a role similar to that of traditional banks.

Behind these non-bank intermediaries there are of course also the traditional banks themselves, which, since the early 1980s, were permitted by public authorities to engage in transactions prohibited by the Glass–Steagall Act. At the beginning of this new, very profitable and completely unregulated financial circuit, commercial banks played only a marginal role – something much to the taste of investment banks, which in fact campaigned against the progressive emptying of the compartmentalization measures. Commercial banks, on the other hand, pushed for the abolition of a set of rules that, instead of promoting their traditional field of action, had come to exclude them from the market-based financial intermediation that was impetuously developing with the blessing of public authorities.

The global financial crisis that erupted in 2008 has put an end to two decades during which practitioners and academics produced a huge number of studies to demonstrate

that the introduction of the Glass–Steagall Act in 1933 was an emergency measure without any rational justification, and had adversely affected the development of American capitalism (see, for example, Benston, 1990). Since then, many voices, even within financial orthodoxy, have been raised against the repeal of the Glass–Steagall Act, calling for a return of its provisions. The usefulness of this return is controversial, not only because the climate of hostility against every form of financial regulation that prevailed over the last decades has been little changed by the crisis. The unholy concentration of power and wealth in the hands of a few who control the financial system and, through it, the whole industrial and political system of the United States is today undoubtedly similar, if not even more pernicious, than the one that occurred at the beginning of the twentieth century. However, the nature of this concentration of power and the ways in which it operates have since then radically changed, and it is not at all obvious that old-style Glass–Steagall prohibitions can be as effective today as they were at the time.

The reintroduction of prohibitions as formulated in 1933 would restrict the traditional activities of commercial banks, without impairing “non-bank” activities, thus simply restoring the unsatisfactory pre-1999 state of affairs. While in 1933 the separation of commercial banks from investment banks was sufficient to separate money market activities from capital market activities, today this is obviously not the case. A new and effective Glass–Steagall Act could hardly refrain from making impractical any gimmick that makes long-term investor commitment perfectly “liquid”. From a legal standpoint, this goal could be accomplished by restricting the access of investment banks to the money market, irrespective of the intermediary and the financial instrument used. This solution raises the problem of how to accommodate the demand for short-term liquid assets that offer a safe return. The way to deal with this problem today seems to be the same as in the decades before the 1980s, when the main financial instrument of the money market was the Government debt.

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See also:

Financial crisis; Investment banking; Lender of last resort; Narrow banking; Shadow banking.

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Goodhart's law

In the early 1970s central banks increasingly began to adopt monetary targets as an intermediate, and potentially manageable, variable in pursuit of their final objective of controlling inflation. Naturally each country that did so, including the United Kingdom, tended to choose that particular monetary aggregate that, up to the date of choosing, appeared to have the most stable relationship with nominal incomes, and hence inflation. By 1975, however, these econometric relationships had in many cases broken down, not only for most demand-for-money or velocity relationships, but particularly so in most countries for that aggregate chosen as the monetary target. While some decline in (predictive) relationship might have been expected in light of the disturbances of 1973–74, for instance the oil shock, sharp rise in inflation, house/property boom/bust, sharply varying interest rates, and so on, what was remarkable was that it was in the case of the chosen targets where the breakdowns seemed most extreme. As Governor Bouey of the Bank of Canada is reputed to have said, “We did not leave the monetary targets; rather they left us.”

It was that observation that led me, at a Reserve Bank of Australia conference in Sydney in 1975, to the comment that the breakdown of such relationships accorded with “Goodhart's Law, that any observed statistical regularity will tend to collapse once pressure is placed upon it for control purposes”. The best source to find this quote now is Goodhart (1984). It was intended as a humorous, throwaway line, and, unlike the Lucas critique, was not based on some deeper underlying analysis, just some limited empirical observation.

Some ways of describing relationships catch on, whereas others do not. Although I had never expected this semi-jocular statement to become regularly used, and moreover used seriously, it was taken on in a broad range of cases, mainly in the social sciences and mainly in the United Kingdom, as an explanation why the translation of prior statistical relationships into control targets so often led to the breakdown of the prior relationship. Goodhart's law, of course, encapsulates the core of the Lucas critique, which is that a change to the control mechanism will elicit a change in the behaviour of the controlled, as they will usually now have an incentive to adjust their behaviour so as to meet the target. But it is also rather more general; in particular the authorities having set a target often feel an incentive to show that their targets are met, and can either change their own behaviour or forebear when they perceive the regulated is manipulating the outcome, so as to be able to claim a “success”.

Anyhow, the common validity of the concept was clear, and the presentation of Goodhart's law seemed simpler than that of the Lucas critique, and so was widely taken on, and became elevated, again by others (not by me), into a serious component of the social sciences, particularly in the United Kingdom. It was dignified, for example, in the paper by Chrystal and Mizen (2003) on “Goodhart's law: its origins, meaning and implications for monetary policy”, and has been extended into other social sciences. Thus, as noted in Wikipedia, Keith Hoskin (1996) has illustrated its broader applicability. See also Strathern (1997), who restated the same concept noting that “When a measure becomes a target, it ceases to be a good measure”.

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See also:

Monetary aggregates; Monetary targeting.

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Greenbacks

Money confers upon its holder the right to claim ownership and control of labour time, produced output, and existing tangible assets. The method by which money is issued in an economic system is thus of critical importance. Money issuance influences the amount of power an agent, an institution, or a sector of the economy has to claim resources. Nation states assert the right to define what legally constitutes money as a means of payment. Governments also define the legitimate issuers of money, as well as the means of issuing it. Monetary arrangements are consequently contested terrain as different alliances attempt to gain more power.

For example, restrictions on the ability of the State to create money (or to issue debt to institutions allowed to create money) are typically loosened in the event of war. Self-imposed monetary constraints, like a gold standard requiring convertibility of a currency on demand, impose budget constraints on the public sector. During war efforts, these self-imposed constraints are typically loosened or suspended, as was the case with Greenbacks issued by the Union side of the US government during the Civil War.

Facing limited powers of taxation and falling import duties on the revenue side, low domestic bank demand for federal government bonds (given fundamental uncertainty about the longevity of the war, and hence the issuer of the bonds itself), and interest rates ranging from 24 to 36 per cent on borrowing from foreign banks, US President Lincoln sought innovations in public finance. US Treasury Secretary Salmon P. Chase persuaded the US Congress in July 1861 to issue 50 million US dollars in demand notes that were printed with green ink on one side. These notes, however, could still be redeemed in gold specie on demand at any US Treasury office. A bleak report on US Treasury finances in December 1861 encouraged banks to suspend convertibility of their own banknotes into gold. Redemption demand by holders of demand notes also rose to a pace high enough that the US Secretary Chase, who was a strong supporter of commodity currencies, suspended convertibility of demand notes by December 1861. Chase instead allowed a yield to be paid on these notes, effectively turning them into perpetual bonds.

As this measure failed to improve the attractiveness of demand notes enough to open up a new financing vehicle for the Civil War effort, and as it became clear that the war was going to take longer than originally anticipated, US President Lincoln persuaded

Congress to pass the Legal Tender Act in late February 1862. This act authorized the issuance of 150 million US dollars in unconvertible (into gold) US notes to pay for the labour and goods required in the war effort. Greenbacks were required to be accepted as a legal means of final payment of all public and private debts – effectively making them a fiat currency, and suspending convertibility of Union currency into gold. Greenbacks were not acceptable, however, as means of payment for import duties, or for payment of interest or principal on public debt, which still required gold coins at pre-Civil War parity. While some may have believed convertibility at par into gold would be reinstated at the end of the Civil War, exchange of these US notes for federal government bonds, which were still convertible into gold, was prohibited in July 1863.

Total outstanding greenbacks peaked at around 449 million US dollars by January 1864. In April 1866, the US Contraction Act required a reduction of the outstanding stock to 356 million US dollars by year-end 1867, in preparation for a post-war resumption of the gold standard. It is estimated that around 15 per cent of US federal spending was funded by greenback issuance, making a substantial contribution at critical points when insufficient tax revenues and bond issuance were placing the Union's war effort in jeopardy (Mitchell, 1903, pp. 119–20). An abstract of US President Lincoln's monetary policy summarizes some of the apparent advantages of greenback issuance:

The government should create, issue and circulate all the currency and credit needed to satisfy the spending power of the government and the buying power of consumers [...]. The privilege of creating and issuing money is not only the supreme prerogative of Government, but it is the Government's greatest creative opportunity [...]. The taxpayers will be saved immense sums of interest, discounts and exchanges. The financing of all public enterprises, the maintenance of stable government and ordered progress, and the conduct of the Treasury will become matters of practical administration [...]. Money will cease to be the master and become the servant of humanity. Democracy will rise superior to the money power. (Owen, 1939, p. 91)

The balance of political power, however, was not such to allow the continued use of a sovereign currency after the war. While the US National Banking Act of 1863 required greenbacks and government bonds to be reserves for national banks, the inflation that had accompanied the war helped the alliance, demanding a return to the pre-war gold standard, gain the upper hand. Salmon Chase later became Chief Justice of the US Supreme Court, and ruled in 1870, in the case of *Hepburn versus Griswold*, that the issuance of greenbacks was unconstitutional. The US Treasury Secretary's convictions in commodity money were so strong that he willingly implicated himself. One year later, new members of the Supreme Court were able to override hard money advocates like Salmon Chase. As legal authorities recognized the implications for contracts made in greenbacks, the entire decision was overturned in the case of *Knox versus Lee*. Such was the contested terrain of monetary arrangements.

Agitation in favour of greenbacks grew as the post-war deflation dragged on, culminating in the panic of 1873. Nevertheless, by 1875, the US Resumption Act was passed by a lame duck Republican Congress, setting 1 January 1879 as the date for redemption of greenbacks in gold specie at par. Yet this move towards resumption of convertibility into gold was also contested, and the US Congress allowed 350 million US dollars in greenbacks outstanding to remain part of the US currency stock. Support for the Greenback Party peaked in 1878 at a 10 per cent share of votes, and further initiatives

were channelled into the “free silver” movement, which demanded the remonetization of silver, and culminated in William Jennings Bryan’s presidential campaign in 1896.

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See also:

Bank money; Fiat money; Money and credit; National Banking Acts; State money.

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Greenspan, Alan

Writing before the global financial crisis, Blinder and Reis (2005) refer to Alan Greenspan’s (1926–) 18½ year tenure as Chairman of the Board of Governors of the US Federal Reserve and of the Federal Open Market Committee (FOMC) as a period in which he was both “lucky” and “good”. During Greenspan’s tenure the United States experienced two relatively short and shallow recessions (July 1990 to March 1991 and March 2001 to November 2001), and the unemployment rate fell to its lowest level for 30 years. However, in a broader historical framework, Greenspan’s performance may be more questionable.

Greenspan was not an obvious choice to be a central banker (see Woodward, 2000; Greenspan, 2008). He lacked an academic background in central banking and/or practical experience in retail or investment banking (though he served on the Board of Directors of JP Morgan). However, he had decades of experience as an economic analyst of the US economy and as a political advisor on economic matters. Following a degree and masters in economics (1948, 1950) at New York University and work as a business research statistical analyst for the National Conference Board (NCB), he began a PhD at Columbia University, whilst also taking on freelance analytical work for *Fortune* magazine. He was introduced to Ayn Rand, whose attitudes to free-market capitalism remained consistently influential throughout his life (see Rand et al., 1966). In 1953, William Townsend invited him to formalize his freelance work and NCB contacts to create the corporate economic consultancy firm Townsend–Greenspan.

In 1967–68 Greenspan was coopted to Nixon’s Presidential campaign as an economic advisor. He served under Ford as Chairman of the Council of Economic Advisors (CEA) from 1974 to 1977, but was dispensed with by Carter. As the *de facto* senior Republican economist, he was coopted to Reagan’s Presidential campaign, and following Reagan’s election victory in 1980 served in a variety of capacities. In 1987, Paul Volcker stepped down from the Fed at the end of his second term, and Greenspan was offered and took the job of Chairman, holding the position until Ben Bernanke replaced him in February 2006.

Whilst at the Fed, Greenspan adhered to the New-Keynesian-synthesis position and with a focus on price stability. During his tenure, the Fed continued its shift from tracking monetary aggregates to a greater emphasis on manipulation of the Fed funds rate

of interest. The emerging context was different from that faced by Volcker. As inflation rates fell, the need for significant changes in interest rates diminished. The Fed was able to develop a strategy of small incremental changes in the Fed funds rate of interest, in conjunction with a variety of “Fedspeak” that communicated a trend in that rate of interest but was sufficiently “constructively ambiguous” to (in principle) create some uncertainty.

Greenspan remained committed to the joint position that deregulated markets are more efficient based on the information-gathering self-interest of agents and expert counter-party surveillance, and that asset bubbles are difficult to identify and deflate. He tacitly accepted that an “efficient” system creates potential financial crises that a central bank then seeks to manage, whilst he also committed his growing authority as Chairman of the Fed to providing testimony against the need for greater oversight and regulation of markets, including finance (Morgan, 2009).

In terms of managing crises, Greenspan acquired a reputation as a competent figure in orchestrating general fixes and specific rescue plans. The Fed’s response to “Black Monday 1987” was to issue the statement that the Fed would supply all necessary liquidity to the system. In 1998, he helped to orchestrate a private bailout of Long Term Capital Management through the intervention of the New York Fed. He also responded to the dot.com crash beginning March 2000 and the events of 9/11 with a series of interest-rate cuts that took the Fed funds rate to 1.25 per cent in October 2002 and 1 per cent in June 2003.

In so far as the United States benefited from the deflationary effects of globalization, Greenspan did not have to face the same inflationary challenges as Volcker. As such, his record within that framework is not particularly impressive, particularly if one considers it in light of a tacit 2 per cent Fed CPI target from 1996. The average inflation rate in the United States during Greenspan’s tenure was approximately 3 per cent, similar to that of equivalent countries such as the United Kingdom and Germany. By the Fed’s own measure, Greenspan was typically overshooting, despite the claimed deflationary benefits of globalization. Moreover, Greenspan placed no figures on his productivity boost and deflation effect argument for low interest rates in the 1990s, nor did he appropriately respond when markets failed to react to the FOMC’s slow tightening of interest rates after the low of June 2003 (see Taylor, 2009). Instead, he translated his scepticism regarding bubbles into a positive statement that housing markets were likely dealing efficiently with current expansions and that new securitization potentials were allocating risk efficiently.

There is a great difference between an acknowledgment that one cannot know and a statement that encourages further market activity. This in turn highlights the contradiction in Greenspan’s commitment to a particular brand of free-market capitalism. In so far as he consistently applied his growing authority to a deregulation position and then matched this with an interest-rate policy that failed to rein in asset expansion, it could be argued that Greenspan contributed to the problems he was then forced to manage and which, following his retirement, became the global financial crisis. A system that was assumed to function on the basis of information efficiencies about which a key agent of the system actively discouraged information collection is always open to the possibility of hidden dysfunction. In terms of modern central banking theory, one might add that the basic failure of the Fed to emphasize the role of and control the rate

of growth of monetary aggregates was also a basic vulnerability that developed during the Greenspan era.

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See also:

Asset price inflation; Bernanke, Ben Shalom; Bubble; Federal Open Market Committee; Federal Reserve System; Financial crisis; Housing bubble; Investment banking; Monetary aggregates; Volcker experiment.

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Gresham's law

Students of economics are often introduced to various laws, such as the "law of demand", "Walras's law", "Say's law", the "law of comparative advantage", and so on, only to discover that, as they pursue their studies or research at a more advanced level, these "laws" succumb to criticisms that can severely limit their applicability. Indeed, among the oldest of these "laws" is Gresham's law, which was espoused by Sir Thomas Gresham during Elizabethan times in the mid sixteenth century, but one can perhaps find traces of it that go back to the writings of Aristophanes in ancient Greece. However, it only became described as an economic law for the first time in 1858 by H.D. MacLeod in *The Elements of Political Economy*, at a time when it was fashionable among classical economists to propose "laws", such as the "iron law of wages" and the "law of the falling rate of profit". Unlike these other laws of classical economics that have not withstood the test of time, Gresham's law persists in the vocabulary of economics even in the contemporary world, even though its relevance is highly debated.

As it is described in the textbooks, the law is succinctly stated as a catchphrase: "Bad money drives good money out of circulation", and it may be argued that, in its most general form, the principle applies to any good that circulates and for which the principle of fungibility is put into question, as for instance "lemons" in the market for used automobiles. However, the lack of fungibility has even more severe ramifications in the case of money, because of tremendous externalities that can arise if the commodity money ceases to be the economy's means of payment.

A monetary unit, such as the dollar, the euro, or the pound, is an abstract monetary yardstick that finds meaning for a community only because of what it commands in exchange or because it allows one to account for the build-up of financial assets or to extinguish one's debts, all denominated in that abstract fungible unit sanctioned by law

and the legal apparatus of the State. In much the same way, a complex private/public accounting system of credit/debit relations exists on the basis of these abstract units of account, whether they are represented by coins, fiduciary notes, deposits in an individual's balance sheet, or in the microchip of a debit card. It is only when the fungibility criterion is no longer fulfilled that the full force of Gresham's law comes into effect. For instance, if one is not indifferent to the specific monetary unit that one holds, whether it is in pennies, nickels, dimes, quarters or equivalent paper dollars, then the principle of non-fungibility applies and the "bad" money can chase the "good" money out of circulation, as long as the two coins have been decreed to exchange at par and, yet, could serve different uses (Hayek, 1967, p. 318). A striking example of this non-fungibility is how silver dimes and quarters quickly disappeared from circulation in North America in the 1960s and were hoarded by the public once other metal coins of the same face value, but of less intrinsic worth, replaced them.

Unlike our modern monetary systems, where coins constitute such a minuscule portion of the economy's means of payment, because of the overwhelming importance of commodity money in medieval times, difficulties of this nature became especially acute. This is because, much as in modern times, feudal law gave the king monopoly right over the mint to issue coins in circulation. However, lacking sufficient fiscal instruments to raise funds in these pre-banking/commodity-based monetary systems, cashed-strapped medieval governments frequently resorted to modifications in the precious metal content of coins in circulation, often termed monetary debasement. One of the most illustrious of scholastic writers, Nicholas Oresme, in fourteenth century France, wrote a famous treatise entitled *Traité de la Première Invention des Monnaies* (ca. 1355), in which he described the implications of persistent monetary debasement and the consequent flight from money along the lines also described by the Polish Nicolaus Copernicus in the early sixteenth century and Thomas Gresham in mid sixteenth century England (Estrop, 1966). It is not known whether Gresham had actually read Oresme or Copernicus, but Gresham's law was well known much before Gresham. However, by the nineteenth century the "law" became associated with Gresham's name and it also reached its peak of popularity because it fitted well the classical commodity-based view of money as put forth by the Currency School tradition in Britain. The overissuing of paper currency relative to its gold base was deemed somewhat analogous to Gresham's conception of monetary debasement.

In the Ricardian tradition of the Currency School, banknotes that were not backed by gold reserves (as compared to those issued at par but fully convertible to gold) would generate an inflation tax or seigniorage revenues much as supposedly occurred because of the behaviour of the monetary authority in Oresme's times when issuing debased metallic currency. Hence, while having the same face value, the issuing of unbacked notes would have similar consequences as medieval currency debasement. Moreover, despite the fact that, since the collapse of the gold standard in the 1930s, we live in a world of inconvertible money, some modern theories of money following the intellectual tradition of the Currency School and the quantity theory of money find some intellectual affinity with Gresham's view of currency debasement. However, Gresham's principle applies only to non-fungible commodity-based currency units that are set at par, which, one may argue, is of little relevance for modern fiat *cum* bank credit money systems.

In more recent times, even those supporters of the mainstream tradition have been

uncomfortable with the predictions of Gresham's law. If the law is correct, then in a world of good and bad monies the workings of the law would suggest that only the worst monies ought to eventually be circulating. That appears empirically untenable and some have argued that the opposite is closer to reality (see Mundell, 1998). In a famous pamphlet on competing currencies, Hayek (1976) argued that, when two currencies denominated in different units are allowed to compete in the same economic space, the result would be a Gresham's law in reverse. The issuing unit whose notes would depreciate the least (the good money) would drive out those that would depreciate the most (the bad money). While some have argued that such analysis can provide insights as to why countries with high inflation rates may choose to dollarize, much as with the examples of currency debasement in the Middle Ages, these manifestations were often mirroring deeper political problems with failed States and not necessarily the workings of Gresham's law.

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See also:

Banking and Currency Schools; Commodity money; Debasement; Fiat money; Hayek, Friedrich Augustus von.

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H

Hayek, Friedrich Augustus von

The contribution by the Austrian economist Friedrich Augustus von Hayek (1899–1992) to monetary theory enhanced a stimulating debate about the role of money in the framework of general equilibrium theory and the challenges for macroeconomic stability. Hayek searched for a systematic elaboration of the Austrian theories of capital, money, business cycles, and comparative monetary institutions.

One definite contribution of Hayek's theory of capital and money is his emphasis on the study of the effects of monetary changes on the relative prices of commodities in the framework of industrial fluctuations. In fact, since the early 1930s Hayek had been concerned about the theory of production (Hayek, 1931). For Hayek, money is neutral; that is to say, the existence of money leaves production and the relative prices of goods undisturbed, as money is simply considered a medium of exchange. In his theoretical approach, the explanation of the causes that make investment more or less attractive can only be reached by closely analysing the factors determining the relative prices of capital goods in the different stages of production. Changes in the relation between saving and investment not only affect the money-streams and purchases of consumers and entrepreneurs but also influence relative prices and the structure of production.

Influenced by Eugene Böhm-Bawerk's theory of capital, Hayek deeply examined the effects of monetary policy on the process of capital accumulation. In order to expand their productive capacity, entrepreneurs can use bank credit to purchase capital goods, if this credit may be obtained at a rate of interest lower than the rate of yield on existing capital (Hayek, 1995). This process will continue until the price of capital goods is so increased that the rate of yield is lowered to equal the rate of interest. As regards investment decisions, Hayek considered that an inflationary credit expansion by the central bank can lead to capital misallocation over time, caused by artificially low interest rates.

Hayek's monetary theory stimulates a far-reaching debate on the role of the government in monetary management and the effects of alternative policies in regulating the issuance of money. The fundamental problem in economics, for Hayek, is that of coordinating the plans of many independent individuals. *The* main advantage of a competitive market order, in Hayek's view, is that rational agents respond to price signals, which convey the relevant information available in the markets, for the purpose of economic calculus. In his view, competition, through the price market system, leads to such a coordination. The underlying critique relies on arbitrary interventions related to the presence of the State in economic systems (see, for example, Hayek, 1944).

Hayek discussed the redefinition of the legitimacy of the State and stressed the need to defeat the growing State intrusion in a democratic framework. Besides, he privileged the analysis of the values that shape the interrelations of individuals in a free society, such as the inviolability of human beings, individual freedom, and justice. Assessing the practical superiority of the free market dynamics over governments' actions, Hayek believed that no government can know enough to effectively plan the future path of the economy and society. Further, central banks do not have the relevant information to correctly manage the money supply.

Friedrich von Hayek, in fact, restated the relevance of concepts and ideas proposed by the classical liberal philosophy, in order to apprehend the contemporary threats to the voluntary decisions of individuals. His aim was to rebuild the foundations of constitutional governments to face the institutional decay in contemporary societies. In the 1970s, Hayek proposed the abolition of the government's monopoly over the issue of fiat money in order to prevent price instability (see for example Hayek, 1976). His defense of a complete privatization of money supply stemmed from his disappointment with central banks' management, which, in his opinion, had been highly influenced by politics. Expressing concerns about the fragile contemporary institutional set-up, where government actions have deleterious effects on social cohesion, the Austrian economist pointed out that political interference over monetary policy and price stability is incompatible with social cohesion. Hayek's proposal of institutional reform relied on a denationalization of money in the framework of a free market monetary regime. At equilibrium, competitive market forces determine the free-floating exchange rates between competing currencies issued by profit-maximizing banks. In this framework, only those currencies that have a stable purchasing power will survive.

In Hayek's contribution to monetary policy, employment and price stability are not necessarily in conflict. However, priority should be given to monetary stability. Aware of the price stability challenges, Hayek strongly highlighted the dangers that arise from monetary financing of public spending. He recommended indeed to dissolve "*the unholy marriage*" (Hayek, 1976, p. 117) *between monetary and fiscal policy*, which, in his opinion, had formally consecrated the victory of "Keynesian" economics after the Second World War.

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See also:

Fiat money; Free banking; Gresham's law; Money neutrality; Money supply.

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High-powered money

Also known as monetary base, high-powered money corresponds to central bank money (coins, notes, and bank reserves) that perform the payment function by virtue of its legal tender status. Under the central bank monopoly of issuance, the monetary base is indeed a claim that the general public, the government and banks have on the central bank. The monetary base is part of the liabilities in the central bank's balance sheet in the form of currency in circulation; that is to say, cash in the hands of the public outside the banking system, and bank reserves, either vault cash at commercial banks or commercial bank deposits at the central bank (required and free reserves).

The monetary base is also called high-powered money because in the neoclassical model changes in the monetary base have magnifying effects on the money supply by the action of the money multiplier. According to this approach, to model money-supply creation, the central bank links the monetary base (MB) to total money supply (M); that is to say, to the total sum of currency in circulation and demand deposits with banks. This relation can be represented using the formula $M = m \times MB$, where m , the money multiplier, is higher than one. Its value depends on the depositors' decisions about holding currency (notes and coins) and the proportion of compulsory and free bank reserves with respect to bank deposits. More precisely, the money multiplier formula can be represented as $m = (1 + c)/(r + e + c)$, where c is the currency–deposit ratio, r is the compulsory reserve–deposit ratio, and e is the free reserve–deposit ratio.

According to this conventional money multiplier analysis, commercial banks borrow funds from depositors and make loans to households and businesses. It supposes that if banks have free reserves above minimum requirements, they will expand loans at a given interest rate. The exogenous increase of reserves on their balance sheets is the starting point of additional loans and deposits (Samuelson, 1948).

Critical of this conventional model, Tobin's (1963) classic contribution highlights that, in fact, banks do not have incentives to expand loans and deposits beyond the profitable level. Credit expansion is the result of profit expectations founded on credit demand, costs of backing liabilities and interest-rate spreads between a set of lending and deposit rates. As a matter of fact, banks create deposits in the process of lending and hold reserves after evaluating opportunity costs.

The interactions between the central bank and commercial banks refer to uncertain decisions in a monetary economy, where, according to Keynes (1936), money, as a conventional institution, is a link between the present and the future. As a result, money is non-neutral in the capital accumulation process that develops through time and involves credit contracts. Considering the non-neutral role of money through the business cycle, Minsky (1982) emphasizes that financial instability relies on endogenously driven fluctuations of credit and money supply.

The post-Keynesian endogenous money theory challenges monetarist recommendations related to money supply quantitative rules and targets in order to achieve price stability. Kaldor (1982), an early critique of monetarism, emphasized both the ability of banks to create new financial instruments to serve as money and the inability of central banks to control the money supply. In the monetarist view, discretionary money supply management explains short-run cyclical fluctuations in the framework of a general equilibrium model, where money is neutral and the demand for money is considered stable. As inflation is always a monetary phenomenon in his view, Friedman (1968) assessed that central banks should control their own liabilities, the money supply and the price level. The monetarist assumptions are founded on empirical evidence that shows a close correlation between variations in money supply and in nominal aggregate income (Friedman and Schwartz, 1963a, 1963b).

As a matter of fact, according to post-Keynesian economics, the money supply is credit driven and demand determined (Moore, 1988). While the post-Keynesian horizontalist approach points out that the central bank accommodates any increase in banks' demand for reserves as a result of increasing loans (Lavoie, 1984; Rochon, 1999), the structuralist

approach highlights that the money supply also depends on the asset and liability management practices of banks (Wray, 1990; Pollin, 1991; Palley, 1997).

In this regard, Minsky's (1982, 1986) structuralist approach to the understanding of the process of money creation shows that banks can search for new sources of funding as well as make use of any additional reserves at the central bank to make loans. Following Minsky, the attempt to control the monetary base can force an increase in the volatility of the rates of interest in the interbank market. To avoid this challenge, central banks have chosen the stability of nominal interest rates and the amount of the monetary base turns out to be a result of multiple decisions that influence financial dynamics.

Indeed, central bank management can influence credit market features by changing costs and availability of bank reserves. Even if a central bank refuses to accommodate additional demands for reserves, however, banks will still be able to partially accommodate an increase in loan demand through their own initiatives, as long as credit expansion is profitable after risks assessment. In a period of boom, banks may introduce financial innovations through interbank loans and securities. Growing financial fragility might put pressure on the central bank to act as lender of last resort so as to face the banks' liquidity constraints. As a result, throughout the business cycle, any credit expansion turns out to be more elastic if the central bank meets the banks' reserve demands. The evolution of money supply is, then, highly dependent on the central banks' reserve management.

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See also:

Asset management; Cash; Central bank money; Endogenous money; Financial innovation; Financial instability; Friedman rule; Inflation; Liability management; Minsky, Hyman Philip; Monetarism; Monetary aggregates; Monetary targeting; Money and credit; Money multiplier; Money neutrality; Money supply; Reserve requirements.

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Housing bubble

A housing bubble is a type of financial bubble that takes place in residential markets. It is distinguished from the broader terms of real-estate bubbles or property bubbles, which include commercial real estate.

The key feature of housing bubbles is a fast appreciation of housing prices, which at some point reach unsustainable levels and then decrease rapidly. For example, from 1997 to 2006 housing prices rose on average by 188 per cent in the United States, while by mid 2009 they had already declined on average by 33 per cent from their peak. The impact of housing bubbles is generally not considered beneficial. The economic slump that usually follows a housing bubble can destroy a sizeable amount of wealth and cause economic discomfort for a prolonged period.

Housing bubbles are a relatively recent phenomenon. Even though the expansion of housing markets and their prices has been witnessed since the 1980s, the term was rarely used until 2002, when it suddenly started becoming increasingly popular (see Case and Shiller, 2003). Housing bubbles have also become a worldwide phenomenon; besides the United States, housing or property bubbles have been witnessed in many countries during the 1990s and 2000s, including Australia, Great Britain, Ireland, Spain, Cyprus, India and China.

Overall, housing bubbles are explained by three types of causes: monetary policy, expectations, and practices in credit and financial markets.

Standard theory emphasizes the transmission mechanism of monetary policy, which is relevant to housing bubbles and must be addressed by monetary policy through higher or lower short-term interest rates (see Mishkin, 2007). These channels of transmission include both direct and indirect effects. Among the direct channels, there is the impact of interest rates on the user cost of housing capital, expectations of future house-price movements, and housing supply. The indirect effects include interest rates on economic activity through wealth effects from house prices and balance sheets, credit-channel effects on consumer spending and balance sheets, and credit-channel effects on housing demand.

A different explanation is proposed by behavioural economics. In this framework, the most important variables are expectations of large future price increases in the housing market and the confidence that sustains these expectations. The relatively widespread contemporary disposition to view house ownership as an investment for wealth appreciation rather than as a residential necessity is a critical feature of housing bubbles (Case and Shiller, 2003). In addition, according to Shiller (2005), housing bubbles are decisively influenced by amplification mechanisms that take the form of price-to-price feedback owing to expectations and confidence.

There has also been a large and mainly post-Keynesian literature that gives greater emphasis to the importance of speculative finance, debt and the credit-creation practices of lenders. Speculative finance in the form of Ponzi finance, which is the focus of Minsky's (1986) financial instability hypothesis, has been utilized to explain how modern forms of housing finance such as mortgage-backed securities facilitate housing bubbles (Keen, 2009). Davidson (2008), however, stresses securitization as the cause of housing bubbles rather than Ponzi finance, because most borrowers cannot speculate as they have minimal equity in their homes and are unable easily to obtain a second mortgage

loan. Finally, another line of argument inspired by Fisher's (1933) debt-deflation theory explains that with the collapse of a housing bubble, the financial burden of repaying or defaulting on the loan rises. This happens because the price of houses decreases while the amount of debt remains constant.

A key question is whether monetary policy can be used to prevent housing bubbles in a manner similar to other types of bubbles. For example, according to Cúrdia and Woodford (2010), monetary policy can respond to asset bubbles through the incorporation of the credit spread between the yield on long-term bonds issued by risky private borrowers on the one hand and those issued by the government on the other.

With respect to housing, Dokko et al. (2009) conclude that expectations of future house-price growth among borrowers, lenders and investors were decisive for the occurrence of the housing bubble in the United States, in line with the views expressed by Shiller (2007). During this episode, mortgage credit was easily accessible and as long as borrowers were able to sustain their accumulation of housing equity the rise in house prices was uninterrupted. While loose monetary policy was certainly providing strength in the housing market, macroeconomic conditions did not drive the housing bubble. In addition, according to Bernanke (2010), interest-rate increases during the period 2003–04 capable of constraining the housing bubble could have seriously weakened the economy and led to an economic slump. In this framework, the housing bubble in the United States must be attributed also to the increased use of exotic types of mortgages and the decline of underwriting practices in line with those explanations that attribute importance to the credit-creation practices of lenders. As a result, the most effective response to housing bubbles is regulatory, not monetary (ibid.).

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See also:

Asset price inflation; Bubble; Credit bubble; Debt deflation; Financial bubble; Financial crisis; Financial instability; Financial instability hypothesis; Minsky, Hyman Philip; Monetary policy transmission channels.

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Hume, David

David Hume (1711–76) is primarily remembered as a philosopher. However, he also made significant contributions to political economy. Among neoclassical economists and the public at large, he is primarily remembered as an antecedent to neoclassical monetary theory for making a clear early statement on the quantity theory of money, which Friedman (see Mayer, 1980) would reanimate to great effect. Given that it was made in an international (that is, open-economy) framework, it has been labelled the price–specie flow mechanism. This is such a common assessment that Krugman (2011) claims that Hume’s “Of the balance of trade” (see Hume, 1752 [1955], pp. 60–78) “was arguably the first example of modern economic reasoning”. However, this emphasis on those particular passages that resemble modern versions of the quantity theory of money do a disservice to Hume’s sophistication as a monetary theorist.

First, it must be noted that “Of the balance of trade” is actually unusual in Hume’s economic writings, because it posits a direct and unequivocal link between specie and prices. In most of his other economic writings he posited a much more complicated and institutionally dependent relationship between “money” and prices. Elsewhere in his *Political Discourses* (the collection of essays in which “Of the balance of trade” appears, see Hume, 1752 [1955]), Hume argues that in the “intermediate situation” (which appears to be something of a transition period) it is the quantity of employed resources and their productivity that adjusts, rather than prices:

In my opinion, it is only in this interval or intermediate situation between the acquisition of money and rise of prices that the encreasing quantity of gold and silver is favourable to industry [...]. Here are a set of manufacturers or merchants, we shall suppose, who have received returns of gold and silver for goods which they send to Cadiz. They are thereby enabled to employ more workmen than formerly, who never dream of demanding higher wages, but are glad of employment from such good paymasters [...]. It is easy to trace the money in its progress through the whole commonwealth; where we shall find, that it must first quicken the diligence of every individual, before it encrease the price of labour. (Hume, 1752 [1955], p. 38)

In his letters, when pushed on his seemingly strong statement, Hume wrote that “I never meant to say that money, in all countries which communicate, must necessarily be on a level, but only on a level proportioned to their people, industry, and commodities” (Hume, 1750 [1932], pp. 142–3). In other words, his “price–specie flow mechanism” was a model of a special case, that of full employment without further income-driven productivity increases.

To understand its place in his writing, one must understand that price-level movements were just one possible mechanism to justify his fundamental (and explicitly religious) belief that in the long run there is convergence in per-capita incomes between countries. In his earlier writings, Hume relied on a modified version of the quantity theory of money to explain why continuous gold inflows would lead to disadvantageous price increases and thus convergence. In a letter responding to Josiah Tucker (whose arguments flowed from the plausibility of divergence) Hume makes a clear statement of this position:

It was never surely the intention of providence, that any one nation should be the monopolizer of wealth; and the growth of all bodies, artificial as well as natural, is stopped by internal causes, derived from their enormous size and greatness. Great empires, great cities, great commerce,

all of them receive a check, not from accidental events, but necessary principles. (Hume, 1752 [1955], p. 201)

However, after much criticism, the price–specie flow mechanism was later abandoned in favour of a technological transfer argument. Rather than the economic growth of countries with balance-of-payments surpluses being checked by a continuous rise in prices, Hume went on to argue in “Of the jealousy of trade” (Hume, 1758 [1955], pp. 78–81) that other countries would catch up by adopting “every art, the inventions and the improvements of our Neighbours” (ibid., p. 79). Hume thus abandoned his earlier belief that the “lead” countries would receive a “check”, but still posited convergence by claiming that the “lagging” countries could catch up. He was open to this change in positions, because he was much more committed to a belief in convergence than to any particular causal argument.

Hence, Hume was a complex writer who, in his most mature writings on economics (and in some of his immature writings), rejected most of the premises of the simple quantity theory of money vision attributed to him by later authors. Instead, he was something of a synthesis of the positions of “mercantile” writers and classical liberals. Indeed, he has often been labelled a “liberal mercantilist”. This can especially be observed in the next generation of political economists he befriended and influenced, namely James Steuart and Adam Smith (Elmslie, 1995). In a kind of reverse dialectic, these writers are a thesis and an antithesis to his own synthesis. Like Hume and his contemporary Tucker, Steuart (see Eltis, 1999; Hudson, 2009) developed the idea that increases of effective demand flowing from balance-of-payments surpluses could lead to increasing employment and productivity, and that this is a cumulative process that can go on indefinitely. Hume’s belief that England’s commercial success would eventually help Scotland was a major influence on Smith (Elmslie, 1994) and helped form his ideas on growth and development. Like Hume, Smith (Hudson, 2009) also criticized (to the point of polemics) the alleged confusion in “mercantile political economy” between wealth and specie.

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See also:

Money neutrality; Quantity theory of money.

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Hyperinflation

Hyperinflation is generally defined as an extremely rapid rise in prices. Its length of duration is short and its end abrupt. The hyperinflationary threshold ranges from 50 to 1000 per cent monthly rate of inflation. This threshold is arbitrary and is set for convenience purposes, rather than those of descriptive accuracy or analytical precision.

The first major burst of hyperinflation occurred in the aftermath of the First World War. The second burst occurred during the Second World War. It has reappeared later on some rare occasions in Latin America, Africa and Eastern Europe.

The record rate of inflation is attributed to Hungary, which between August 1945 and July 1946 recorded an average rate of inflation of 19,800 per cent per month with an extreme of $4.2 \cdot 10^{16}$ per cent in July 1946 (Cagan, 1987). More recently, in November 2008, Zimbabwe nearly reached these levels ($7.96 \cdot 10^{10}$ per cent).

The study of hyperinflation has led to some important developments in theory, contributing to discussions on the real-balance effect and on forced savings, and to the introduction of expectations as a fundamental determinant of the value of money (Robertson, 1926 [1989]). At the policy level, hyperinflation is associated with stabilization debates and institutional and market reforms (Feldman, 1993; Heyman, 1993).

The study of hyperinflation also leads to an understanding of the conditions under which monetary systems break down. Keynes (1919 [1988]) remarked that hyperinflation destroys the very foundations of capitalism, namely the relationship between debtor and creditor. More importantly, hyperinflation turns the entrepreneur into a speculator “destroying the psychological equilibrium which permits the perpetuance of unequal rewards” (Keynes, 1923 [1971], p. 24).

Hyperinflation has been analysed under the lens of two competing theories. The first, the balance-of-payments approach (BPA), focuses on external imbalances and continuous depreciations in the exchange rate. The weight of the explanation is put on the relationship between the nominal exchange rate, wages, and prices. This explanation was developed in Germany during and after the First World War, and traces hyperinflation to the reparation payments imposed by the Treaty of Versailles and its subsequent effect on the balance of payments (Helfferich, 1927 [1969]). The BPA was further refined by Robinson (1938), Kaldor (1985), and Davidson and Kregel (1980), putting the emphasis on wages and indexation as a transmission mechanism between the exchange rate, costs and prices.

The second approach, the fiscalist approach (FA), was developed by Cassel (1922) and combines the quantity theory of money with the theory of purchasing-power parity (PPP). It was applied as a rebuttal to the BPA view of the German hyperinflation (1922–23) by Bresciani-Turroni (1937). It traces the cause of hyperinflation to budget deficits as a result of wars, reconstruction, reparation payments, large debt obligations, weak governments, and inefficient taxation systems. The ensuing monetization of budget deficits, its relationship to the inflation tax (that is, the real depreciation of money balances owing to inflation), and its transmission to prices and the exchange rate forms the core of the FA analysis. The latter was elaborated upon by the monetarist and rational expectations schools, as a way to show the universal validity of the quantity theory of money (Cagan, 1956; Sargent and Wallace, 1973).

Hyperinflations end abruptly. As Kaldor (1985, p. 61) pointed out, they are “like the

great plagues of the past. They burn themselves out". The FA explains the sudden stop of price increases in terms of a regime change: "an abrupt change in the continuing government policy, or strategy, for setting deficits now and in the future that is sufficiently binding as to be widely believed" (Sargent, 1983, p.42). The implementation of such a regime change has come at an enormous social and economic cost. An alternative interpretation, in line with the BPA, emphasizes changes in external conditions, incomes policies and the political economy of hyperinflation (see Kalecki, 1962). Also, under hyperinflation the indexation lags between prices and costs tend to become shorter, weakening the feedback forces of both variables.

Consistently with this viewpoint, it can be argued that hyperinflation illustrates Keynes's (1936) recommendation of the need to make wages sticky, to guarantee "the stability of values" in a monetary production economy.

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See also:

Inflation; Monetarism; Monetary approach to the balance of payments; Quantity theory of money; Real-balance effect.

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¹ The opinions here expressed are those of the author and may not coincide with those of the institutions with which he is affiliated.

I

Impossible trinity

The impossible trinity, also known as the “trilemma”, defines a set of economic policies that a country cannot manage together in open economies. This “trilemma” is widely accepted by mainstream (and also most heterodox) academic economists and policy makers. According to this proposition, it is impossible for a country to simultaneously stabilize the nominal exchange rate of its currency and engage in an autonomous monetary policy (to set domestic interest rates any different from foreign interest rates) if capital mobility is perfect.

The expression “trilemma” was first used by Obstfeld and Taylor (1998), although this open economy trade-off in establishing the economic-policy mix is a well-known and established result derived theoretically from the Mundell–Fleming model. This model, developed some decades before, is an open-economy extension of the Keynesian IS–LM model (with rigid nominal wages and prices) in which, in a framework of perfect capital mobility and fixed exchange-rate regime, any domestic nominal interest rates set differently from foreign interest rates will generate a change in foreign exchange reserves, and consequently in the stock of high-powered money and money supply. The effect of this last variable on domestic interest rates guarantees that monetary policy is ineffective; that is, there is an automatic mechanism that equalizes domestic and foreign interest rates through adjustment in the domestic money supply.

Nowadays, the impossible trinity is theoretically grounded in the uncovered interest parity theorem. In this way, under a credibly-fixed exchange-rate regime and perfect financial integration, it is impossible for a monetary authority to set domestic interest rates any different from foreign interest rates, as “arbitrage in open capital markets [. . .] clearly defeat[s] the objective [that is, the ability to drive local interest rates]” (Obstfeld et al., 2005, p. 423). It is worth noticing, however, that although nowadays this result is not theoretically referred to the Mundell–Fleming model, the same kind of adjusting mechanism of domestic interest rates to international capital flows is necessary to imply the lack of monetary policy autonomy.

As a corollary of the impossible trinity, at the beginning of the 2000s some economists believed that countries must engage in extreme exchange-rate regimes (either a hard peg as a currency board or a free-floating exchange rate). This “bipolar” view of exchange rate regimes, however, was not supported by the experience, because of the collapse of the hard peg system in Argentina in 2002 and the very successful experience of countries that adopted intermediate exchange-rate regimes, such as heavily managed or “dirty” floating (Fischer, 2008).

In the late 2000s, a related empirical challenge to trilemma supporters was to explain the process of accumulation of massive quantities of foreign-exchange reserves by a vast group of developing countries. Some economists, such as Aizenman (2013, p. 11), claim that this new fact adds a “fourth dimension in the Trilemma”, as countries hoard foreign-exchange reserves in order to gain degrees of freedom to operate monetary and exchange-rate policy, even in a framework of perfect international capital mobility.

In addition to these empirical challenges faced by the “impossible trinity”, there are

also some criticisms regarding the theoretical framework that supports it. The first one refers to the idea that perfect capital mobility implies that capital flows are extremely sensitive (infinitely elastic) to interest-rate differentials. Even if a country does not impose some sort of capital control, imperfections in international capital markets, like the imperfect substitutability between assets in different countries, can reduce this sensitivity. Additionally, there is no guarantee that any amount of capital flows can really be attracted to a country just because domestic interest rates are higher than foreign rates of interest without the risk of some credit rationing. This means that the trilemma's free capital mobility concept also presupposes the very strong hypothesis of perfect international capital markets, which does not seem to happen in practice (Serrano and Summa, 2015).

Another theoretical criticism is concerned with the mechanism of adjustment of domestic interest rates to foreign interest rates, which is based on the assumption of non-sterilized interventions. Following the exogenous interest rate/endogenous money approach, there is no automatic mechanism that would force the central bank to adjust domestic interest rates to foreign interest rates. At the interest rate set by the central bank, changes in foreign-exchange reserves have no reason to lead to equal changes in the monetary base. If the monetary authority also pegs the nominal exchange rate, then sterilization occurs automatically and naturally (Lavoie, 2001).

Moreover, the trilemma ignores that there is a strong asymmetry between maintaining domestic interest rates below or above foreign interest rates, when the exchange rate is pegged; that is, between situations in which a country is losing or accumulating foreign exchange reserves (Frenkel and Rapetti, 2008). This is so, as foreign-exchange reserves are finite and when they are depleted the monetary authority cannot sustain the peg any longer. On the other hand, as several countries can always issue government bonds denominated in their own currency, there is no upper limit to a positive interest-rate differential when the stock of foreign-exchange reserves is increasing.

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See also:

Endogenous money; High-powered money; International reserves; Money supply; Optimum currency area; Sterilization; Triffin dilemma.

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Inconvertibility

Inconvertibility (the opposite of convertibility) means *de jure* or *de facto* impossibility for a national currency of being converted into (i) a given type of commodity or precious metal (gold or silver) under a commodity-money standard, or (ii) other national currencies (foreign currencies) under a fiat money (paper money) standard.

Under a *metallic standard* consisting of gold or bimetallism (gold and silver), inconvertibility means *de jure* or *de facto* inability of exchanging a paper currency for metal, either fully or in part, or at an exchange rate fixed in advance. In a situation like this, the primary source of the purchasing power of money is considered to be not the value of the metal but the authority and power of the sovereign, the legal mastery of the State.

A kind of inconvertible paper money was issued in twelfth century China (as evidenced by Marco Polo). A century later, a similar type of money was issued in Persia; and yet another century later, in Japan. Subsequently, fiat money spread to Europe basically in two major forms. The first was paper money issued by the State or the Treasury, and could be referred to as fiscal (State) paper money, and the second form of money was issued by banks or a given bank that was granted a monopoly (charter) over this activity by the State. To the first type of money belong the “Assignats” and “Mandats” from the French Revolution period, and the “Continental currency” from the time of the American Revolution, the “Greenbacks” and the “Confederate notes” from the American Civil War period, as well as the multiple issues of Russian “Assignats” by the Russian tsars. To the second type – the bank-issued inconvertible paper money – belong the banknotes issued by the Bank of England (1797–1821) or by the Banque de France during the Revolution in 1848 and after the Franco-Prussian War in 1870–71.

In monetary theory, economists believed for a long time that fiat money could not be considered as genuine money but rather as money substitutes introduced under extraordinary circumstances, such as in times of war or natural disasters. Inconvertibility was seen as a temporary disruption of the healthy rule of guaranteed circulation by precious metals (gold and silver until 1873, and gold only in the period 1873–1914). According to the majority of economists, convertibility was a source of confidence in money, of price stability and fiscal discipline.

After World War I, attempts were made to restore the convertibility of paper money into gold. For that purpose a number of monetary conferences were held under the auspices of the League of Nations (for example the Genoa conference in 1922). In most countries, however, stabilization and convertibility were introduced for a short time (mostly during the period 1925–36). The Great Depression inevitably led to a widespread currency control, clearing and compensation schemes. After World War II, under the Bretton Woods (1944) regime, the gold-dollar standard was introduced whereby only the US dollar was convertible into gold (35 dollars per gold ounce), and all other currencies were convertible into dollars. The system continued as far as 1971, when the US dollar was devalued and its link with gold was severed. Since then, money has no longer been convertible into gold and exchange rates have been manageable to different degrees.

Today, in a situation of modern fiat and credit money, inconvertibility can take various forms subject to the range of activities, which are restricted, or subject to the range of economic agents concerned. In this sense, it can be full or partial, external or internal.

A full, integral inconvertibility exists when the injunction or incapability of a national currency to be converted into foreign currencies extends to all external economic deals (practically the whole balance of payments) and to all economic agents (residents and non-residents). In this case, we can speak of economic autarchy, of economic and monetary nationalism. In the case of partial inconvertibility, restrictions exist with regard to the exchange of a national currency into a foreign currency for certain types of activities, for instance in trade operations, tourism, or in transactions in equity instruments or financial assets. An external inconvertibility is when non-residents are limited in converting a national currency into a foreign currency, while with internal inconvertibility such a limitation exists in relation to residents. A note should be made here that according to Art. VIII of the International Monetary Fund Statute, individual countries are required to introduce convertibility of their currencies on their current account operations.

Currency inconvertibility exists for both economic and political reasons, which as a rule go hand in hand. The economic reasons are mainly associated with the chronic deficit of the balance of payments and the outflow of foreign-exchange reserves. The most prominent political reasons are the aspiration for military and resource independence, which are coupled with a nationalistic, anti-globalist and often left-leaning ideology. An example of an economic motive is the practice of currency monopoly, currency clearings and compensation deals during the inter-war period and especially their wide use within the German zone of influence (Central Europe and the Balkans). Within these systems there is a broad range of exchange rates for the different types of transactions with strongly segmented trade entities and foreign-exchange markets in most cases. Another example of ideological convertibility is the socialist COMECON experience (1949–91): its member states' currencies were inconvertible not only *vis-à-vis* Western currencies but also among themselves. COMECON countries aspired to break away from the world economy and the price movements in the international market. Therefore, they resorted to currency inconvertibility and arbitrary setting of their exchange rates.

Among the range of exchange-rate regimes, what stands out most are currency board arrangements, which offer full convertibility and coverage of the monetary base in foreign currency at a legally fixed exchange rate, radically limiting the monetary policy of the country adopting this exchange-rate regime. In a sense, they reproduce many of the gold standard principles. Currency boards were introduced in Ireland (1943–79), Hong Kong (since 1983), Djibouti (since 1949), Argentina (1991–2002), Bulgaria (since 1997), Estonia (1992–2011), and Lithuania (since 1994), among others.

NIKOLAY NENOVSKY

See also:

Bank money; Bretton Woods regime; Commodity money; Currency board; Fiat money; Greenbacks; State money.

Inflation

Inflation is currently defined either as a persistent rise in the general price level or as a decrease in the value of money; that is to say, a decrease in its purchasing power. If one

assumes that the purchasing power of money is inversely proportional to the price level, one could easily infer that, *ceteris paribus*, a continuous rise in prices is but a decrease in the value of money. But is this assumption correct? Is it right to claim that a general rise in price levels affects, always and necessarily, the purchasing power of money? Inflation can be defined as a persistent rise in the general price level if and only if the answer to these questions is positive.

The intuition that links a higher level of prices with a reduction in money's purchasing power rests on the idea that in any national economy the purchasing power of money is given by the value of the goods that can be purchased through the expenditure of national income. However, if prices measure the value of goods, every increase in prices defines an equivalent increase in their value so that, even if fewer goods can be purchased when prices are higher, the value obtained in exchange for a given sum of money remains unchanged. The purchasing power of money is not less, because the decrease in the quantity of goods is offset by the increase in their value. It follows that, in order to properly define inflation, we should begin by correctly defining the value of goods and their relationship to money. The national accounting equivalence between national product and national income is the key to the solution. It is because money and currently produced output are the two terms of an equivalence that money has a positive purchasing power. Let us suppose a country's national output to be monetized, through the payment of its cost of production, by 100 units of money. The country's national income is equal to 100 units of money, and its real content is the country's national output. A correct analysis of inflation has to explain how it is possible for the 100 units of national money to lose part of their real content (see Cencini, 1995).

Instead of addressing this question, economists have confined their analysis of inflation to the empirical observation of consumer price index fluctuations and to the search for the microeconomic causes of these fluctuations. In doing so they have mistakenly underestimated the need to carefully distinguish inflation from a rise in the cost of living. In fact, even though a rise in the consumer price index may reduce somebody's standard of living, this may well have nothing to do with inflation, which defines a reduction in the overall purchasing power of money and not just in some individual incomes (see Rossi, 2001).

Mainstream economists have traditionally regrouped the causes of "inflation" into two broad categories: demand-pull and cost-push. Bankers, consumers, and the State are believed to be at the origin of demand-pull inflation when they finance overspending or overspend themselves. Trade unions are said to generate cost-push inflation when they impose a rise in wages exceeding the increase in labour productivity. Yet, a simple analysis shows that under no circumstances can behaviour alter the relationship between money and produced output. An increase in taxes merely redistributes income between economic agents, while an increase in wages gives rise only to a change in the monetary expression of newly produced output and not to a reduction in the real content of money. As for a reduction in savings, it would increase total demand only if demand could be reduced by saving in the first place. This is never the case since saved income necessarily takes the form of bank deposits, and bank deposits do not reduce the amount of income available in the economic system.

Let us represent the purchasing power of money as the merging of money (a numerical form) and current output (its real content) (Figure 3).

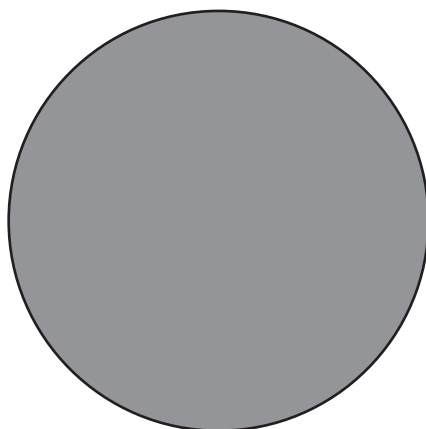


Figure 3 The “merging” of money and output

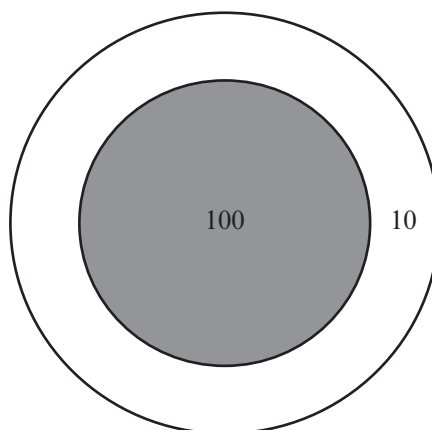


Figure 4 The numerical increase of nominal money units

Inflation occurs when the same output (say, in the value of 100) is distributed over an increased number of money units. Suppose that 10 units of money are added to the 100 units defining the cost of current output (Figure 4).

As a result of the emission of 10 units of “empty” money, current output is now carried by 110 money units: every money unit loses some of its real content; that is, some of its purchasing power. How this can happen is explained by Schmitt’s (1984) quantum monetary analysis, which identifies inflation as one of the consequences of the pathological process of capital accumulation. Besides the case where public or private deficits are covered by money creation – a pathological intervention that most central banks avoid at all costs – inflation occurs in situations where the present system of payments is inconsistent with the logical/analytical distinction between money, income and fixed capital. It is because such a distinction has so far been ignored that capital accumulation leads to the mechanical emission of inflationary “empty” money.

Fixed capital is formed through the investment of profit, and Schmitt (1984) proves that, from the very outset of our banking systems, this expenditure has taken place in a pathological way. The production of consumer, capital and amortization goods gives rise to three distinct sectors, because wages that paid for the production of fixed capital goods are purely nominal. Inflation, the unavoidable consequence of this “empty” emission, is not limited to the formation of fixed capital goods. The production of amortization goods required to restore fixed capital to its initial value also leads to an empty emission, which confirms for good the pathological distinction of the economy into three sectors. Inflation will be definitively overcome only when a monetary reform is implemented by the banking system, based on the introduction of a threefold distinction between monetary, financial, and fixed capital departments, and replacing the existing distinction between sectors (consumer, capital, and amortization goods).

ALVARO CENCINI

See also:

Bank deposits; Consumer price indices; Core inflation; Inflation measurement.

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Inflation measurement

The measurement of inflation reflects the conventional understanding of this phenomenon. In so far as inflation is considered as an increase in the general price level, statisticians and economists refer to some price index in order to calculate the rate of inflation by assuming that the latter results from the rate of change in that index over time.

The traditional measurement of inflation is therefore based on some form of the Consumer Price Index (CPI). Based on a basket of goods and services purchased during the reference period by so-called “representative” consumers, the CPI provides an index number for the price level of this basket of consumption goods at time 0 (the reference period). Calculated at time t (the current period), this index number represents the price that a consumer has to pay, if s/he wants to buy the very basket of goods and services bought by the representative consumers during the reference period. If so, then the percentage rate of change of the price index between the reference period and the current period is a proxy for the inflation rate.

In mathematical form, the rate of inflation based on the CPI is calculated as in equation (1).

$$\pi^t = \frac{\sum_{i=1}^n p_i^t \times q_i^0}{\sum_{i=1}^n p_i^0 \times q_i^0} - 1 \quad (1)$$

Equation (1) shows that the rate of inflation (π) in the current period (t) is the ratio between the expenditure required in the current period to purchase the basket including n goods and services (i), expressed in the reference period (q^0) at current prices (p^t), and the amount of money spent in the reference period to purchase the same basket (q^0) but at the prices paid during the reference period (p^0), minus one. The result of equation (1) is usually expressed in percentage points. Suppose for instance that the numerator in equation (1) is equal to 102 and the denominator equals 100. In this case, the rate of change in prices is equal to 2 per cent: it means that in order to buy in period t the same basket of goods and services bought in period 0, the representative consumer will have to spend 2 per cent more than s/he spent in the reference period. Assuming (implicitly) that the quality of the items within the basket does not change between periods 0 and t , one simply infers that the rate of inflation is equal to 2 per cent between these two periods.

The traditional measurement of inflation, however, suffers from a superficial understanding of the latter. Indeed, the essence of inflation (that is, a loss in money's purchasing power) is captured by its surface phenomenon (an increase in the general price level, proxied by some price index). As shown by Rossi (2001), there may in fact be other factors beyond inflation that can explain an increase in the general price level (or its proxy), such as a higher markup by firms (owing to their increased market power) or a higher tax rate (for instance, value added tax), both of which exert an upward pressure on consumer prices without modifying the purchasing power of money – since both affect income distribution across the economy but not its total amount at a particular point in time.

This conclusion remains valid for all other inflation measurements used to date, such as the Retail Price Index without mortgage payments (RPIX) used by the Bank of England for its monetary policy strategy, the Personal Consumption Expenditure (PCE) index considered by the US Federal Reserve, the Harmonised Index of Consumer Prices (HICP) calculated by Eurostat, as well as any “core inflation” indices established by monetary authorities or national statistical offices as proxies for the rate of change in money's purchasing power over time.

In fact, the loss in money's purchasing power cannot be measured by price indices, since the latter may remain stable or even be reduced in spite of inflation. Suppose, for instance, that the selected price index between the reference and current periods remains at 100. This is not enough to deduce that – in light of price stability – inflation is non-existent: owing to technical change, as a matter of fact, production costs diminish over time; if, nevertheless, prices do not diminish, this may be ascribed to a loss in money's purchasing power (to wit, inflation), whose origin remains to be understood and explained logically (Cencini, 1995, ch. 3). The same occurs when the selected price index diminishes, inducing one to infer that the rate of inflation is therefore negative: owing to technological progress, which reduces production costs, the price level could be lower than it appears, if the purchasing power of money is reduced by inflation. Figures 5 and 6 illustrate these stylized cases (see Rossi, 2011).

To be sure, to date, inflation measurement is based on a microeconomics understanding of inflation – that is, an increase in prices that one imagines to capture with an “aggregate” of prices in the form of some price index. In fact, inflation being a macroeconomic disorder, a truly macroeconomic approach is required in order to understand and to address it correctly. As modern monetary circuit theorists have shown (Bradley

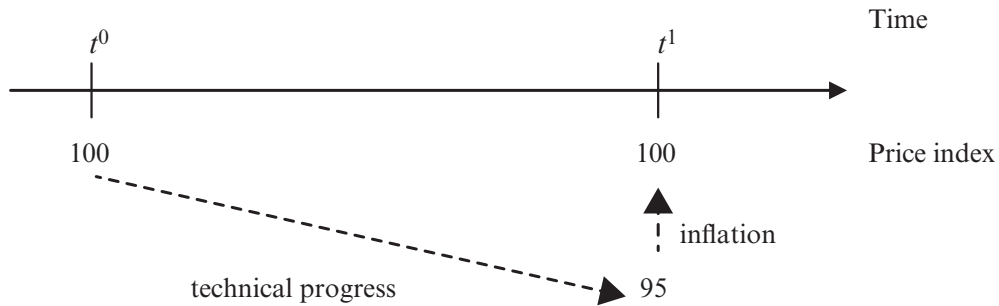


Figure 5 Inflation and price stability can coexist

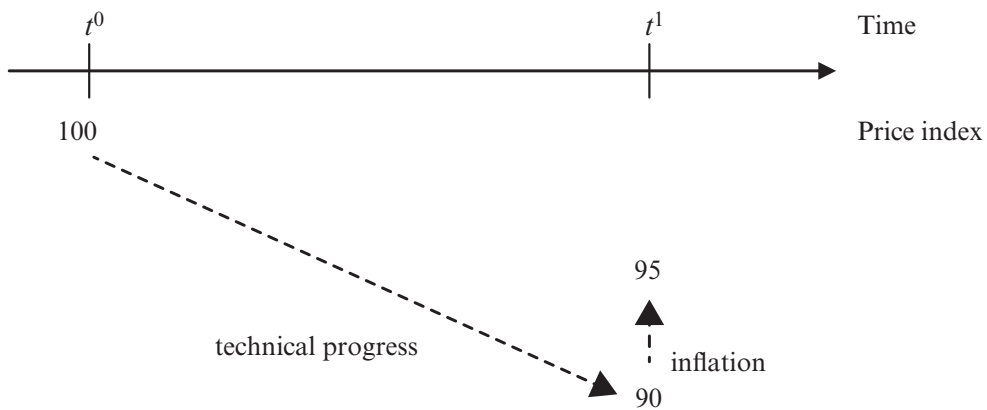


Figure 6 Inflation can coexist with a reduction in the price level

and Piégay, 2012), inflation has to be explained by the process of capital accumulation on the factor market, rather than by the process of income expenditure on the market for produced goods and services.

SERGIO ROSSI

See also:

Consumer price indices; Core inflation; Inflation; Money supply.

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Inflation targeting

Inflation targeting is a monetary policy strategy that consists in targeting a rate of inflation to fulfil the central bank's mandate. This strategy is characterized as follows (see Bernanke et al., 1999, p. 4):

- (1) a public announcement of official quantitative targets (or target ranges) for the inflation rate over one or more time horizons;
- (2) an institutional commitment to price stability as the monetary policy's primary long-run goal, and a commitment to achieve the inflation objective in any case;
- (3) an information-inclusive strategy in which many variables and not merely a monetary aggregate are used in the monetary-policy decision-making process;
- (4) vigorous efforts to communicate the plans as well as the objectives of the monetary authority to the public; and
- (5) an increased accountability of the central bank for attaining its inflation rate objectives.

Inflation targeting regimes have been in fashion since the early 1990s, after the Reserve Bank of New Zealand first introduced such a regime in 1989, to reduce the double-digit inflation rate that had been observed in that country during most of the 1970s and 1980s.

According to Bernanke et al. (1999, pp. 299–301) inflation targeting is a “half-way station” between a rule-based and a fully discretionary monetary policy. As they call it, it is a sort of discretionary monetary policy under constraint. Indeed, inflation targeting is not as rigid as a rule, since it does not imply an automatic intervention by the central bank in the case of some particular event such as an increase in the rate of inflation. This monetary policy strategy is, however, not as flexible as the theoretical case for absolute discretion, as the central bank is obliged to announce the rate(s) of inflation that it targets over a given time horizon. Owing to this public announcement, the central bank is accountable for the effects of its monetary policy interventions, for instance as regards the rate of inflation or real GDP growth. This is likely to affect the central bank's credibility, hence the agents' expectations, with important implications for the time lags and effects of monetary policy on the economic performance of the relevant country (Rossi, 2004).

An important issue in this regard concerns the numerical value of the targeted inflation rate that one may consider as the definition of price stability. As Svensson (1999, p. 277) notes, two alternative views exist. The first view considers that price stability prevails when the measured rate of inflation is low and stable (around 2–3 per cent). The second view defines price stability literally – that is, a zero-measured rate of inflation. The literature distinguishes these alternatives, referring to inflation targeting and price-level targeting respectively (see Lilico, 2000).

Countries that have an inflation targeting regime to date define price stability as a positive rate of inflation. In fact, price-level targeting is more easily conducive to deflation (Mishkin and Schmidt-Hebbel, 2002): if the targeted price level is overshoot, the central bank must induce deflation in some future period, to compensate for the deviation in the target. As deflation gives rise to output and employment losses over time, however, it is much more worrying than inflation, especially if the latter is low and stable (Rossi, 2004).

Another issue concerns the choice between a point target and a target band for the policy-desired inflation rate. This choice affects monetary policy flexibility to a significant extent. The *sine qua non* condition for adopting a precise inflation target (say, 2 per cent on a year-to-year basis) without putting monetary policy at stake is that the central bank must be able to persuade both the general public and financial markets' participants that its policy tools allow it to meet the target and that unforeseen shocks (on either demand or supply) may be the cause for over- or undershooting a target (Bernanke et al., 1999, pp. 294–5). Only in this case will the economic agents be disposed to accept a deviation from the inflation target without losing confidence in the central bank, which is necessary for a point target strategy to influence agents' expectations. By contrast, a target band for the rate of inflation offers more flexibility to monetary policy makers, and informs the public that a central bank cannot control the inflation rate independently of the economic situation. In this case, however, markets will react more strongly – and the central bank's credibility will be more at issue – if the observed inflation rate lies outside the targeted band than if it does not correspond to the point target. As a result, agents' expectations would be more volatile and uncertain. Nevertheless, a central bank must carefully assess the width of its target band: if this band is too large (in order to meet it more easily), it may jeopardize the central bank's credibility as well as its ability to implement a disinflation policy effectively (that is, with low costs in terms of output and employment). If the band is too narrow, by contrast, the likelihood that the central bank will not meet it increases considerably, which might give rise to some monetary policy credibility problems (see Mishkin, 2000).

SERGIO ROSSI

See also:

Central bank credibility; Credibility and reputation; Inflation; Inflation measurement; Monetary aggregates; Monetary targeting; Price-level targeting; Rules versus discretion; Taylor rule.

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Ingot Plan

Monetary theory and policy remained among David Ricardo's fields of interest throughout his entire academic life. In his first published articles in the popular press (see

Ricardo, 1809 [2004]; 1810–11 [2004]), Ricardo defended a position within the Bullionist Controversy, where he blamed the Bank of England for the observed gold premium and bullion drains. Although he later changed his focus towards value and distribution theory (see Ricardo, 1817 [2004]) – certainly his most outstanding contribution to economic science – monetary discussions would come up again in his last work, the *Plan for the Establishment of a National Bank* (1824 [2004]), published six months after his death. With few exceptions, Ricardo's monetary thought has been mostly underestimated, under the belief that he added nothing to the received quantity theory and Humean price-specie flow mechanism (see, for instance, Rist 1938 [1966], pp. 140 and 173).

Ricardo's ideas were inspired by the specific political and institutional conditions of his time, namely the British "Restriction Period" (1797–1821). During those years of suspended cash payments and Napoleonic Wars, inflation accelerated rapidly. In contrast to the former Price Revolution (c.1520s–c.1650), however, the phenomenon was not generalized, but affected England specifically, thereby ruling out any explanation rooted in the gold and silver mines. The fact that inflation surged in combination with a persistent gap between the mint price and the market price of gold made the inflationary bias of the inconvertibility of banknotes the focal point of debate among classical scholars.

The transition towards gold convertibility became a major concern after the end of the Napoleonic Wars in 1815. Instead of returning to the pre-1797 regime, Ricardo suggested an innovative plan for restoring cash payments: the "Ingot Plan". As Bonar (1923) reminds us, different versions of the Ingot Plan were put forward in Ricardo's successive monetary works. It was first published as an appendix to the fourth edition of the *High Price of Bullion* (1810–11 [2004]), then as a separate pamphlet in his 1816 *Proposals for an Economical and Secure Currency*, and finally developed in his posthumous *Plan for the Establishment of a National Bank* (1824 [2004]). Specifically, the Ingot Plan aimed at maintaining gold as the standard of money but substituting it with paper as a medium of circulation. Such a goal could be achieved by making banknotes redeemable directly in bullion, rather than coins. As a result, there would no longer be a wasteful alternation of coining and melting, or the inconvenience of circulation in metal. Further, the country's gold reserves could be reduced, thus freeing resources that could be directed toward production.

Ricardo's Plan was actually embodied in the Resumption Act of 1819, but its most relevant clauses did not become operative (Schumpeter, 1954 [1994], p. 662). The transition from an inconvertible paper system to renewed specie convertibility took place in a framework of deflation and recession, ending up with the financial crisis of 1825. Deflation was sensitively larger than expected: Ricardo had projected a price reduction of 5 or 6 per cent following resumption, equivalent to the excess of the market price above the mint price of gold (Ricardo, 1819 [2004], p. 385). The fall in prices, however, was twice as steep. According to Ricardo (*ibid.*), prices decreased exceedingly owing to the inconvenient market purchases of specie by the Bank of England, in view of the forthcoming restoration of convertibility. Such behaviour was at odds with his recommendation of reducing the price of gold according to a fixed scale until the mint price was reached, but without increasing the Bank's bullion reserves (*ibid.*, p. 381).

As Sayers (1953) points out, Ricardo's contemporaries rejected the Ingot Plan, and understood it as a transitional phase from inconvertibility to specie payments. For instance, Smith (2011) highlights Tooke's critique to Ricardo, which stressed that the

Plan implied a small bullion reserve relative to the needs of the balance of payments. Nevertheless, a century later, many countries would adopt it, under the gold exchange standard. It would also be invoked as the source of inspiration for Marshall's *Symmetrical* system (Marshall, 1887 [1925], pp. 204–05), a monetary arrangement advanced by him in times of the Bimetallic Controversy (c.1880–98).

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See also:

Bullionist debates; Hume, David; Inconvertibility; Quantity theory of money; Ricardo, David.

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Inside and outside money

A multitude of instruments perform the functions of money (means of final payment, units of account, stores of value). The distinction between inside and outside money derives from an examination of the conditions of supply for that instrument from the perspective of the private sector (Lagos, 2006). Should a zero net supply exist for an instrument performing the functions of money in a closed economy with no public sector, then private claims against each other cancel out and this amounts to saying that money was created inside the private sector. To be more specific, inside money is created, exists and is destroyed through a set of balance-sheet operations within the financial sector. This is nothing more than an application of double-entry bookkeeping and observing that across private sector balance sheets, in a closed economy with no public sector, assets must always equal liabilities.

However, the existence and influence of the public sector must be admitted. Accordingly, outside money has a positive net supply from the perspective of the private sector since

it is not offset by a corresponding claim existing solely within the private sector. Outside money therefore represents a net asset for the private sector as a result of its origination outside the set of balance-sheet relationships that inform the existence of inside money. Outside money arises as a result of the public sector engaging in transactions with the private sector. It is possible to open the domestic economy and admit the existence of a foreign sector, but nothing essential is gained for the distinction between inside and outside money given that outside money is the exclusive domain of the public sector.

A continued differentiation of the subcategories of inside and outside money is possible and may yield useful information for analysis of the critical role of money in capitalist economies. However, staying at the current level of abstraction and classification it is possible to bring to the front two additional implications surrounding the distinction between inside and outside money.

In the first place, the identification of a distinction between monies created within and without the private sector calls for additional inquiry into the general nature of money. Orthodox accounts of the origin and nature of money issue from a particular view regarding the working of the economy. Essentially, in orthodox theory, money emerges as the most sellable physical commodity through the consensual interaction of market participants. Then, it is often argued, seeing an opportunity for enrichment the public sector assumes a monopoly over the supply of money, most often through the imposition of seigniorage. Alongside of the intervention of the state comes the emergence of depository institutions. Such “banks” enable an expansion of the private or state money stock beyond its physical quantities; hence the distinction between inside and outside money for the orthodoxy. It should be noted that, as such, money is something external to the working of the economy. Money’s place today as the most sellable of all commodities is preserved either through its continued general acceptability in exchange, some vague association with “real” money (that is, gold) or legislative fiat.

By way of contrast, heterodox monetary theories stress the significance of money as a social relationship and, importantly, a hierarchical one. Admitting that there are several instruments that more or less perform one, some, or all of the functions attributed to money, it follows that there is actually a pyramid consisting of both inside and outside monies (see Foley, 1987 [1989]; Bell, 2001). A number of the various heterodox schools presented by Smithin (2000) argue that the essence of the social relationship underpinning the hierarchical nature of money is most often of the creditor–debtor variety. Further, based on their liquidity and risk characteristics, some of these monies may pay an interest to their holders. The analytical consequence that money is always in the nature of a debt is that, following Keynes (1936 [1964], p. 167, fn. 1), “we can draw the line between ‘money’ and ‘debts’ at whatever point is most convenient for handling a particular problem”.

Second, a most unfortunate ramification of the distinction between inside and outside money has been the emergence of the erroneous notion that the supply of outside money may have some influence on the ability of the private sector to create inside money. Conventional reasoning asserts that, for a variety of reasons, such as the inflationary bias of inside money creation and the monetary constraint imposed by reserve requirements, there is (or should be) some identifiable relationship between the supply of outside money and the capacity of the private sector to create inside money. However, this line of reasoning – predicated upon the assertion of an exogenous money supply – appears to

be crumbling under the theoretical assault brought forth by endogenous money theorists, practicing central bankers, and empirical evidence. This development is fortunate in that, while the distinction between inside and outside money will remain relevant, theoretical emphasis will shift away from revealing the detrimental effects of inside and outside money creation for economic activity and towards the more relevant question of how the creation of inside and outside money is essential to the operation of capitalist economies.

JAMES ANDREW FELKERSON

See also:

Bank money; Central bank money; Commodity money; Endogenous money; Fiat money; Reserve requirements; State money.

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Interdependence of money demand and supply

Money is a component of the total liquidity of the economic system. The traditional view, which goes back to the Currency School, considers money demand and supply as independent. According to this conception, the central bank has the ability of controlling the money supply by expanding or constraining the monetary base, independently of money demand. This is the typical monetarist exogenous view, which looks at the monetary base as a control variable. It is shared by the "New neoclassical synthesis", which, combining Keynesian and classical elements, assumes sticky wages and prices and a stable LM curve, and proposes a questionable policy of inflation targeting.

This picture, which reflects the orthodox view, is not realistic. Today, a large part of the nominal supply of money consists of endogenous credit-money issued on demand of firms by commercial banks, in the form of bank loans and overdraft facilities, to meet the needs of production. This is inside money, not a legal tender, but a liability for the issuer.

The exact nature of the nominal supply of money in an economy where fiat and credit money coexist is still a matter of debate. It is convenient to distinguish between "narrow" and "broad" money supply. The monetary base – the sum of currency in circulation and reserve balances – is usually supposed to be under direct control of the monetary authority, but there are authors who consider it endogenous, as ultimately influenced by the decisions of commercial banks (Rochon and Rossi, 2003). Broader aggregates of money, which include demand deposits, are fully endogenous.

A basic issue concerning the choice of the control variable of monetary policy is the direction of causality of the transmission mechanism of the shocks involved. Does

the causality relation go from the supply of money to real economic variables, through the banking system, or the other way round (“reverse causality” between money and income and between deposits and loans)? Is the supply of money an effect of the demand for money, or a cause of it? This is not simply a point of doctrine. What is at stake is the role and the relative effectiveness of monetary and fiscal policies.

Absolute reverse causality is assumed by those full endogeneists who think that the influence of aggregate demand is equally important in the short- and in the long run, and that so does the effectiveness of monetary policy on real variables (Lavoie, 1992). My personal view is somewhat different: there is fundamentally a bidirectional causality and a basic interdependence of money demand and supply, especially in the long run.

Most post-Keynesians (PKs), in the Banking School tradition, consider the supply of money infinitely elastic at the interest rate established by the monetary authority. They regard it as fully endogenous – that is, credit driven and demand determined – and represent it by a horizontal line in the interest-money space (Moore, 1988). This position is shared by some “monetary circuitists”, who consider money a means of payment created *ex-nihilo* by banks, without limits, to meet the demand for finance of firms (not as a possible store of value, nor a result of portfolio decisions).

It has been objected that this view is not reconcilable with Keynes’s liquidity preference theory, that it presupposes a monetary equilibrium framework, not ensured by the closure of the monetary circuit, and that by downgrading the relevance of the monetary base and bank reserve requirements as tools to regulate the endogenous money supply, it underrates the role of the central bank in the money creation process.

The endogeneist view of money supply is opposed by the monetarists of the Chicago School and by all those who believe in the long-run validity of the quantity theory of money and in the logical priority of savings over investments. The vertical money supply schedule these economists have in mind is considered as suitable to be shifted rightward or leftward by open-market operations of the monetary authority, and as matched by a downward-sloping curve of the demand for money.

A different, less fundamentalist position is held by those “structuralists” who consider the supply of money a positively sloped line, due to the presence of institutional constraints, uncertainty and increasing financial risk (Palley, 1991). They are PKs who deny that the expansion of credit money can go on indefinitely and maintain that banks have a liquidity preference which can affect negatively their responsiveness to the demand for credit.

Other scholars of established heterodox reputation reject from an authentic Keynesian perspective the idea of a long-run neutrality of money and the “New Keynesian consensus” vision of a central bank following an interest rate Taylor rule and of inflation as an exclusively monetary phenomenon. They refuse a policy of inflation targeting, do not identify all money with transferable credit rights and do not attribute to the nominal supply of money a definite endogenous nature, implying a view of the central bank as an accommodating price-maker and quantity-taker lender of last resort. They accept the idea that money supply is essentially endogenous, but think that a fully accommodative reserve policy by the central bank is unrealistic in the presence of policy constraints. What is truly endogenous is the real supply of money, which depends on the velocity of circulation of money (Cavaliere, 2004).

DUCCIO CAVALIERI

See also:

Banking and Currency Schools; Bank money; Central bank money; Endogenous money; Fiat money; Inflation targeting; Inside and outside money; Lender of last resort; Monetarism; Monetary aggregates; Monetary circuit; Money supply; Open-market operations; Quantity theory of money; Reserve requirements; Taylor rule.

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Interest rate pass-through

The interest rate pass-through denotes a two-stage process through which shifts in monetary policy interest rates initiated by the central bank are transmitted to retail bank interest rates. In a first stage, changes in policy interest rates are transmitted to short-term money market interest rates. These modifications are then passed on to long-term market interest rates along the yield curve. In a second stage, banks adjust their interest rates on loans and deposits following these variations in market interest rates (Égert et al., 2007).

The interest rate pass-through is an important part of the monetary policy transmission mechanism, as it is conditional on its completeness that a change in monetary policy stance will affect the investment decisions of firms, as well as households, finally influencing aggregate demand, and thus output.

In the perfect competition model of Freixas and Rochet (2008), the interest rate on loans is equal to the market interest rate augmented by a markup, while the interest rate on deposits equals the market interest rate weighted by the proportion of deposits that are not held in required reserves plus a markdown. Therefore, in this theoretical model the interest rate pass-through is complete on loans, as well as on deposits in the case of no reserve requirements.

The empirical results for the euro area, where the financial system is bank-based, show that a shift in the monetary policy rate of interest is entirely transmitted over the long run to the one-month and three-month interbank market rates of interest (De Bondt, 2005). Yet the long-run pass-through of changes in the market interest rates is limited on current account deposit rates and consumer loan rates, while it is about two-thirds on lending rates to firms, as highlighted by Kok Sørensen and Werner (2006). In the United States instead, where the financial system is market-based, the long-run pass-through on deposit rates and short-term lending rates of interest addressed to enterprises is complete, whereas it is partial on lending rates to households (Kwapil and Scharler, 2010).

These differences in the level of the long-run interest rate pass-through between loans

and deposits in the euro area may be due to a greater elasticity of loans' demand relative to deposits' supply (De Bondt, 2005). The interest rate pass-through also varies between households and firms, because they are not affected to the same extent by asymmetric information problems in their access to financing. Indeed, large firms have a greater bargaining power with respect to households, owing to their capacity to finance themselves on financial markets. Finally, the magnitude of the long-run interest rate pass-through is lower for short-term than for long-term bank deposits. The rationale may be the difference in the supply elasticity between savings deposits and time deposits.

Moreover, the literature shows that both microeconomic and macroeconomic factors affect the interest rate pass-through. Bank balance-sheet features, such as the level of banks' liquidity, capitalization and the importance of the bank–customer long-run relationship have an impact on banks' interest rates short-run adjustment behaviour on short-term loans. The composition of banks' liabilities influences the short-run interest rate pass-through on current account deposit rates (Gambacorta, 2008). Macroeconomic factors like the GDP growth rate, inflation, money market interest rate volatility, the extent of bank competition, the development of the money market and the level of the public sector share in the bank ownership also affect the level of the interest rate pass-through (Cottarelli and Kourelis, 1994; Sander and Kleimeier, 2004; Gigineishvili, 2011). This explains why the interest rate pass-through differs among countries within the euro area (Mojon, 2000; Sander and Kleimeier, 2004; Kok Sørensen and Werner, 2006), or among the regions of a country like Italy, as explained by Montagnoli et al. (2012).

Finally, is the interest rate pass-through uniform throughout the interest rate cycle? Actually, following an upward change in the market interest rate, banks are not necessarily inclined to raise their lending rates in the presence of asymmetric information, as they are likely to attract riskier borrowers and may prefer to ration credit (Stiglitz and Weiss, 1981). In addition, banks may have the incentive to delay the revision of their interest rates, owing to the existence of adjustment costs and relationship banking until the costs of not adjusting exceed those of adjusting (Sander and Kleimeier, 2004).

NATALIA ANDRIES

See also:

Exchange-rate pass-through; Monetary policy transmission channels; Policy rates of interest; Reserve requirements; Yield curve.

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Interest rate rules – post-Keynesian

In an endogenous money environment, the central bank’s policy instrument is an interest rate rather than the quantity of money in circulation. For post-Keynesians, this raises the “Smithin question” (Smithin, 2004, p. 63): in the absence of a Wicksellian natural rate, at what level should the interest rate be set? Answering this question involves postulating an interest-rate rule that guides the setting of interest rates by the central bank.

According to Rochon and Setterfield (2007, 2008, 2012), two qualitatively different types of interest-rate rules emerge from the “activist” and “parking it” approaches to monetary policy in post-Keynesian economics. These approaches share important similarities: their fidelity to endogenous money theory, and their rejection of the dedicated use of monetary policy to target inflation. But they differ with respect to the roles they ascribe to monetary policy, and the precise interest-rate rules to which they give rise.

The activist approach is predicated on the idea that monetary policy has a vital – although by no means exclusive – role to play in short-run macroeconomic stabilization (Palley, 1996, 2006; Fontana and Palacio-Vera, 2006). The activist approach calls for the central bank to change the interest rate whenever cyclical or other disturbances cause economic outcomes to deviate from the central bank’s preferred outcomes. The interest-rate rule therefore takes the form of a reaction function, in which the nominal interest rate (i) is altered in response to any deviation of macroeconomic variables (summarized by the vector Ω) from their target values (Ω_T) as set by the central bank:

$$\Delta i = f(\Omega - \Omega_T) \quad (1)$$

In accordance with equation (1), the expectation is that the central bank will change the interest rate frequently in response to deviations of macroeconomic variables from their target values and, in so doing, will “fine tune” the economy towards these target values.

The “parking it” approach is allied to the claims that fiscal policy should play the dominant role in countercyclical stabilization policy, and that greater attention should be paid to the distributional consequences of monetary policy – in particular, the effect of interest rates on the income share of the *rentier* class (Smithin, 2004; Godley and Lavoie, 2007; Wray, 2007). An important feature of the “parking it” approach is the idea that the central bank should establish a level of the interest rate that is invariant to economic fluctuations over the course of the business cycle. Three distinct variants of the “parking it” approach can be identified, each giving rise to a specific interest rate rule (Rochon and Setterfield, 2007, 2008, 2012). The “Smithin rule” claims that the optimal real interest rate is approximately zero, consistent with accumulated financial capital maintaining

(but neither losing nor increasing) its value in real terms (Smithin, 2004). The Smithin rule therefore involves setting the nominal interest rate equal to the trend rate of inflation in the economy. The “Kansas City rule”, meanwhile, is based on the idea that, absent government intervention to drain excess reserves from the banking system, the nominal interest rate will tend towards zero. The Kansas City rule therefore advocates setting the nominal interest rate equal to this “natural” rate of zero (Forstater and Mosler, 2005), as a result of which the real rate will generally be negative. Absent their assuming sufficient risk, this would effectively involve the “euthanasia of the *rentiers*”. Finally, the “Pasinetti rule” (or fair rate rule) aims to leave unchanged the purchasing power of financial wealth in terms of labour time (Lavoie, 1996, p.537). This requires, in the first instance, that financial wealth grow at the same rate as the nominal wage. Since nominal wage growth must equal the sum of the rates of inflation and productivity growth in order to maintain a constant wage share of income, the Pasinetti rule ultimately requires that the nominal interest rate be set equal to the rate of inflation plus the rate of productivity growth.

The three variants of the “parking it” approach can be summarized by the composite interest rate rule:

$$i = \beta_p p^* + \beta_q q^* \quad (2)$$

where p^* and q^* denote the equilibrium or trend rates of inflation and productivity growth, respectively, and either:

$$\beta_p = 1, \beta_q = 0 \quad (\text{the Smithin rule})$$

or

$$\beta_p = \beta_q = 0 \quad (\text{the Kansas City rule})$$

or

$$\beta_p = \beta_q = 1 \quad (\text{the Pasinetti rule}).$$

In accordance with equation (2), the expectation is that the central bank will change the interest rate only infrequently in response to changes in the trend or equilibrium values of p and/or q , in order to consistently maintain a particular distributional stance *vis-à-vis* the income share of *rentiers*.

MARK SETTERFIELD

See also:

Endogenous money; Inflation targeting; Monetary policy and income distribution; Natural rate of interest; Policy rates of interest; Wicksell, Knut.

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Interest rates setting

In monetary economics it is useful to distinguish short-term interest rates from long-term interest rates. Short-term interest rates refer to the interbank market rates of interest on central bank money, while long-term interest rates refer to the cost private-sector agents must pay either to get credit-money from banks or to sell bonds in capital markets.

The view that central bank interventions have a powerful impact on interbank interest rates is widely accepted. For instance, in their effort to increase rates as high as they want, central banks can withdraw reserves from the interbank market if they offer an attractive reward, or they can issue reserves as required to allow banks to borrow at a zero interest rate. Actually, it may be sufficient for central banks to simply announce the desired (target) interest rates and let market rates converge, although effective interventions are sometimes necessary.

The setting of long-term rates of interest, however, is more problematic. The modern neo-Wicksellian mainstream view is that competitive forces drive the long-term interest rate to the equilibrium interest rate (the "natural" interest rate), which makes supply and demand for saving equal as stipulated by the "loanable funds theory". Nevertheless, to the extent that, in this conceptual framework, the long-term interest rate can deviate temporarily from the "natural" interest rate, it is admitted that authorities may have temporary control over the long-term interest rate through the setting of the short-term interest rate. When the market's long-term interest rate is below (above) the equilibrium interest rate, the economy is experiencing inflation (deflation), and the central bank can increase (reduce) the short-term interest rate so that the long-term interest rate increases (decreases) towards the "natural" rate of interest. This is the rationale for the so-called "Taylor rule" and "inflation targeting" strategies.

According to this theoretical framework, the relation between the short-term rates and the long-term rates of interest (that is, the term structure) depends on the valuation

of risks (higher risks attached to long-term contracts, hence higher long-term interest rates in principle). Insofar as risks are considered as “structural” factors, the interest rate spread provides a stable relation through which a central bank can control effectively the long-term interest rates by simply setting the short-term rate of interest adequately.

It was the essence of Keynes’s *General Theory* (1936) to show that, as the future is fundamentally uncertain, competitive forces simply cannot anchor the economy to any predetermined “natural” position. In the absence of such a predetermined anchor, the equilibrium long-term rate of interest is determined by the market’s subjective views about the future (a “convention”, insofar as the future is not objectively predictable). As Keynes (*ibid.*, p. 203) noted in this respect:

The long-term rate of interest is a highly conventional [. . .] phenomenon. For its actual value is largely governed by the prevailing view as to what its value is expected to be. Any level of interest which is accepted with sufficient conviction as likely to be durable will be durable; subject, of course, in a changing society to fluctuations for all kinds of reasons round the expected normal.

Indeed, as long as the actual interest rate is below (above) the conventional level, the market interest rate is logically expected to increase (decrease). Therefore, bearish (bullish) expectations in financial markets continue to fuel (reduce) liquidity preference and make money relatively more scarce (more abundant) and more expensive (cheaper), so that the long-term interest rate eventually goes back to the conventional interest rate.

It thus appears that monetary authorities may fail to reduce long-term interest rates below the conventional interest rates for any extensive period of time, because the demand for money (liquidity preference) may be capable of maintaining the relative scarcity of money and the related long-term interest rates against the wish of a central bank.

Thus a monetary policy which strikes public opinion as being experimental in character or easily liable to change may fail in its objective of greatly reducing the long-term rate of interest, because M_2 may tend to increase almost without limit in response to a reduction of r below a certain figure. (Keynes, 1936, p. 203)

This questions the stability of the relation between short-term and long-term interest rates, and therefore the capacity of monetary authorities to set the long-term interest rates through the setting of short-term interest rates (see Atesoglu, 2005, for empirical evidence). To do so, monetary policy must be convincing enough as to curb the market’s subjective expectations, which does not always depend on the sole goodwill of the authorities (Keynes, 1936, pp. 202–04).

The long-term rate, therefore, may fluctuate for decades about a level which is chronically too high for full employment; particularly if it is the prevailing opinion that the rate of interest is self-adjusting, so that the level established by convention is thought to be rooted in objective grounds much stronger than convention, the failure of employment to attain an optimum level being in no way associated, in the minds either of the public or of authority, with the prevalence of an inappropriate range of rates of interest. (*Ibid.*, p. 204)

Finally, some post-Keynesians argue that central banks can effectively control even long-term interest rates (see Lavoie, 2006, for instance). This view gave rise to the post-Keynesian literature on interest-rate rules aimed at offering an alternative to the

“inflation targeting” strategy (see Rochon and Setterfield, 2007, and Asensio, 2012, for a discussion).

ANGEL ASENSIO

See also:

Central bank money; Inflation targeting; Interest rate rules – post-Keynesian; Interest rates term structure; Money and credit; Natural rate of interest; Policy rates of interest; Taylor rule; Wicksell, Knut; Zero interest-rate policy.

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Interest rates term structure

The term structure of interest rates refers to the values assumed by the time profile of interest rates for the same debt instrument over different maturities. This concept, while intimately related to the more familiar “yield curve”, is distinct in that it concerns the actual interest rates observed, while the yield curve is the depiction of such in the form of a graph illustrating the relationship between interest rates and maturities.

The concept of a term structure of interest rates consists of two related topics. First, what determines the rate of interest paid on a debt over different terms to maturity? Second, what (if any) informational content is embedded in the term structure of interest rates with respect to future economic activity; that is, can observation of the term structure of interest rates be used for predictive purposes in monetary policy formulation?

A widely used textbook on the subject presents three stylized facts that “a good theory of the term structure of interest rates must explain” (Mishkin, 2010, p. 131). These are: the comovement of interest rates over different maturities; the relationship between low (high) short-term interest rates and high (low) long-term interest rates; and the historical phenomenon of long-term interest rates greater than those of shorter maturities.

We can follow Mishkin (2010) further, and distinguish three prevailing theoretical explanations for the determination of the term structure of interest rates. The first is known as the expectations theory, whose intellectual ancestry can be found in an attempt by Hicks (1939 [1946], p. 164) to ground Keynes’s (1936) liquidity preference theory of interest rates in something more substantial than uncertainty regarding the future course of interest rates. Simply put, and resting upon the critical assumptions that bond holders do not discriminate between the different maturities and that all bonds are held to maturity, the expectations theory argues that arbitrage will ensure that the rate of interest on debts of longer durations equals the average of expected interest rates on

shorter-term debts over the whole life of the longer-term debt. A second theoretical explanation is the segmented markets theory, which holds that substitutability between debts of the same type but of different maturities is not as great as that presumed under the expectations theory. Advocates of this approach, such as Culbertson (1957), stress the non-substitutability among debts of different maturities and that, although expectations and liquidity considerations are not to be ignored, it is ultimately the idiosyncratic preferences of debt issuers and debt holders operating in thoroughly independent markets that determine the term structure. By maintaining that higher credit and income risks, and therefore liquidity premia, are attached to debts of longer maturities, it is possible for the segmented markets theory to provide a defensible explanation for the historical phenomenon of higher interest rates on longer-term debts relative to those of shorter-terms. The third and perhaps the most widely accepted theoretical explanation of the determination of the term structure today is the liquidity premium theory and its corollary, the preferred habitat theory. The liquidity premium theory expands upon the expectations theory view that long-term rates of interest are a function of the shorter rates of interest expected to rule on average over the life of a debt, but in order to address the possibility of borrower default makes explicit the role of interest-rate risk. This means that longer maturities are assigned higher premia. A similar result can be obtained through the introduction of heterogeneous agent time preferences that allow for individual debt holders to discern among debts of different maturities. This approach follows the observation made by Modigliani and Sutch (1966) that a higher return is required to induce debt holders of one “habitat” to hold debts of longer maturities and vice versa. The correspondence between the liquidity premium and preferred habitat theories is found in a shared vision regarding a positive spread (which increases with maturity) between interest rates. Thus, Mishkin’s (2010) criteria of what constitutes a “good theory of the term structure of interest rates” are fulfilled.

However, it is unclear whether the liquidity preference and preferred habitat reconstitution of expectations theory to allow interest-rate risk and heterogeneous agent preferences is entirely immune to the criticism made by Kahn (1954) that the expectations theory depends upon an unrealistic assumption regarding market behaviour. If leveraged traders, who are concerned above all with capital gains and losses, were to dominate debt markets in the place of income investors, the direction of causation would be reversed with changes in long-term debts instrumental in the determination of those of shorter maturities. Thus, the admission of the speculative adjustment of debt portfolios in response to short-term profit opportunities makes it possible to have a liquidity preference theory that takes uncertainty and expectations into consideration in meaningful way, and thereby does “not hang by its bootstraps” as alleged by Hicks (1939 [1946], p. 264).

If one ascribes to the conventional notion that the decision to hold interest-bearing financial assets is largely related to intertemporal decisions regarding current versus future consumption, it is possible to identify within the term structure of interest rates some predictive competence regarding future economic activity. For example, should long-term interest rates fall with respect to short-term rates of interest, a recession is indicated in that agents are bidding up the price of longer maturity debt in an attempt to prepare for a fall in output and employment. The debate on this matter continues, however, and it is far from certain that conventional economic models fully appreciate how financial market variables affect the real economy. Nevertheless, a review of the lit-

erature (see Wheelock and Wohar, 2009) musters evidence in favour of the argument that the term spread can be an effective policy tool.

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See also:

Interest rates setting; Policy rates of interest; Yield curve.

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International gold standard

The establishment of the gold standard, internationally, was a historically contingent process. A decisive moment in its establishment was the defeat of France in the Franco Prussian War (1870–71) and Germany's subsequent use of war indemnity to expand a gold-based currency.

Gold (or currency convertible into gold) was the principal means of settling international payments across most of the world during the international gold standard. The heyday of the gold standard (that is, the period between 1870 and 1914) is regarded as a model of a stable international monetary system. The Currency School attributes this stability to the workings of the price–specie flow mechanism. Trade deficits lead to outflows of gold that reduce the stock of gold within the deficit country. This leads to a fall in its price level and thus to a restoration of its competitiveness. The period, however, witnessed relatively small gold flows. In light of this, stability was explained by the actions of central banks that played by the "rules of the game" – reinforcing or substituting for the price–specie flow mechanism. Empirical evidence, however, suggests that these rules were routinely violated in the pre-war period (Bloomfield, 1959). Even so, authors like Eichengreen (2008) argue that a credible commitment to convertibility by "core countries" was enough to ensure a pattern of stabilizing international capital flows, so that the system could withstand temporary deviations from the rules of game without disruption. This commitment was buttressed by the relative insulation of national central banks from domestic political compulsions and the cooperative consensus among core countries in Europe on maintaining convertibility, until the First World War.

In contrast, approaches within the Banking School tradition argued against any automatic equilibrating mechanism under the international gold standard. Trade deficits would lead to gold outflows and a rise in domestic interest rates and debts, thus dampening investment. Keynes (1980) pointed to the inherent deflationary bias of the gold

standard. For him, the smooth workings of the international payments system in the late nineteenth century rested on the pivotal role played by the Bank of England in replenishing the gold and capital of its partners through overseas lending. This meant that some of the burden of adjustment was being borne by the creditor country, alleviating the deflationary spiral of downward adjustments (ibid.).

The stability of the international monetary system, during this period, thus depended on its “management” by the Bank of England, which was able to calibrate international movements of gold and capital, with relatively small gold reserves, by manipulating its own policy rate of interest.

The efficacy of the Bank’s interest rate policy hinged on the emergence of an international financial system centred on and dominated by England in the last two decades of the nineteenth century. The financial revolution in England saw the rapid development and concentration of joint-stock banks, merchant banks and discount houses, while the surge in international trade fuelled the growing use of sterling bills as a mechanism of finance that was independent of the Bank of England (de Cecco, 1984). With the emergence of the “Bill on London” as a means of international payments, international liquidity could be created, despite a small gold base and beyond the constraints imposed on note issues by the Peel Act of 1844 (see de Cecco, 1984; Vasudevan, 2008).

While it has been argued that the small gold base was a sign of the essential vulnerability of the Bank of England (see Gallarotti, 1995), this was in fact a reflection of the strength of the Bank of England’s interest rate policy and its ability to draw gold when necessary. Britain in the period preceding the First World War acted as an international lender of last resort, and injected liquidity by borrowing short and lending long. Its interventions were successful in forestalling a flight of capital in the face of growing trade deficits, dwindling reserves and financial crises (for instance the Barings crisis of 1890).

The provision of international liquidity did not depend on a short-term creditor position of Britain (Vasudevan, 2008). Rather, Britain’s ability to calibrate short-term capital flows and act as a lender of last resort hinged on the willingness of foreign governments and banks to hold sterling liabilities. When crises erupted, the Bank of England was able to prevent a drain of gold not only by borrowing from financial institutions and from other countries but also by borrowing from “special depositors”, including the governments of India and Japan.

Britain’s relation to its empire and to primary export producers in the “periphery” – in particular the triangular pattern of settlements whereby England financed its trade deficits with the United States and continental Europe through the trade surpluses of the empire – was integral to the stable working of the system (de Cecco, 1984). The flow of British investment into primary exporter countries in the Americas also compelled the accumulation of sterling balances to meet debt obligations. Credit expansion was further facilitated by the adoption of some form of gold–sterling standard by countries in the empire, including India, Malaya, Ceylon and Siam (see Lindert, 1969).

Unlike countries in the core, however, countries in the periphery were more vulnerable to crises. While Britain recycled liquidity to the periphery through capital outflows, it could also sharply withdraw lending and cut investments, so that the burden of adjustment during crises fell on the periphery (Ford, 1964; Lindert, 1969). Such crises occurred in Argentina in 1890, Brazil in the 1890s, and Australia in 1893. These crises were aggravated

by the sudden withdrawal of British deposits. Convertibility in the leading countries of the centre was, however, not jeopardized by these crises, at least till the First World War.

The tensions and instability of the inter-war period reflected the erosion of Britain's ability to fulfil the role of lender of last resort in the face of the growing debt and the unravelling of its imperial hegemony.

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See also:

Bank Act of 1844; Banking and Currency Schools; Bank of England; Bretton Woods regime; Capital flight; Financial crisis; Inconvertibility; Lender of last resort.

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International Monetary Fund

The International Monetary Fund (IMF) is an international organization based in Washington, DC that aims to ensure the stability of the international monetary system. It groups 188 countries and is one of the 15 specialized agencies of the United Nations.

The IMF was conceived during the conference at Bretton Woods in 1944 and entered into force on 27 December 1945 with 22 member countries. The Articles of Agreement regulating it underwent six amendments, but the purposes of the IMF, as listed in Article I, are still unchanged and are:

- (i) To promote international monetary cooperation [. . .], (ii) To facilitate the expansion and balanced growth of international trade [. . .], (iii) To promote exchange rate stability [. . .], (iv) To assist in the establishment of a multilateral system of payments [. . .]; (v) To give confidence to members by making the general resources of the Fund temporarily available [. . .] to correct maladjustments in their balance of payments [. . .] (vi) [. . .] to shorten the duration and lessen the degree of disequilibrium in the international balances of payments of members. (International Monetary Fund, 2011, p. 2)

To reach these goals, the IMF can put in place three kinds of actions. First, surveillance, suggesting policies and monitoring the compliance of its members' obligations. Second, financial assistance, financing members encountering problems with their balance of payments. This financial support is conditional to the implementation of policy reforms designed by the IMF. Third, technical assistance, training and advice for its members.

The IMF obtains most of its resources from the quotas that each country must pay to become a member, and occasionally it can resort to borrowing as an additional source of finance. Quotas are meant to reflect the size of each country's economy and play a key role in the functioning of the IMF. Indeed, they determine not only the membership but also the voting power of each country in the IMF Executive Board and the magnitude of the loans each member may obtain.

As regards the governance of the IMF, its key body is the Executive Board, which is in charge of the daily activities of the IMF. It is composed by 24 Executive Directors, elected or appointed by member countries. The Executive Board in turn elects and is chaired by a Managing Director staying in charge for a renewable term of five years. Formally the highest decision-making body of the IMF would be the Board of Governors, constituted by one governor and one alternate governor for each member country. However, the Board of Governors delegates most of its powers to the Executive Board with the exception of those related to the structure of the IMF as the admittance of new members. The staff and two committees (the International Monetary and Financial Committee, and the Development Committee) support the work of the two Boards.

During its history the IMF had to mutate to adapt to the evolution of the world economy. It was indeed meant to institutionalize the new monetary system arising from the conference of Bretton Woods. According to the Bretton Woods system, all countries had an exchange rate pegged to the US dollar, whose exchange rate was fixed with respect to gold. In this setting, the role of the IMF was twofold. It worked first as a regulator, defining the rules of the system, and second as a stabilizer, providing financial assistance to members experiencing balance-of-payments imbalances so severe as to undermine the exchange rate of their currency. With the collapse of the Bretton Woods system in 1973, the consequent adoption of floating exchange rates by industrialized countries, and the dramatic growth of capital markets, the IMF moved the focus of its lending activity to developing economies (Felushko and Santor, 2006) and, according to the 1976 amendment of Article IV of the Agreement, introduced its supervision activity. A further major set of reforms followed the 2008 global economic crisis to increase its financing capacity and effectiveness, and to address problems in its governance (Mountford, 2009). This led to the review of quotas, to the increase of access to borrowed resources, and to the development of a new and more flexible lending framework.

The IMF played a central role in all major financial turmoil after the end of the Bretton Woods system (to wit, the Latin American debt crisis in the 1980s, the 1997 Asian financial crisis, the 2008–09 global financial crisis and the euro-area crisis in 2009–10), providing financial support in the aftermath of these crises. The IMF interventions have been highly controversial and received numerous and harsh criticisms mostly focused on the policy agenda imposed through loans' conditionality (Chang, 2002; Ocampo, 2003; Stiglitz, 2003; Papadimitriou et al., 2012). According to critics, the conditions imposed by the IMF emerge from a dogmatic and simplistic economic approach imposing fiscal austerity, privatization and liberalization regardless of the specific economic environments. The resulting policies have been considered (Pastor, 1989; Varoufakis et al., 2011) both harmful for growth and more functional to the economic interests of international corporations than to the official purposes of the IMF.

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See also:

Bretton Woods regime; Dollar hegemony; Financial crisis; International settlement institution; Keynes Plan.

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International reserves

International reserves (also called official international reserves) include all those external liquid assets that are controlled by monetary authorities for meeting the financing needs of the balance of payments, intervening in foreign-exchange markets, and for other related purposes, such as maintaining confidence in the currency and the economy, and serving as a basis for foreign borrowing (Independent Evaluation Office of the International Monetary Fund, 2012).

International reserves include foreign-exchange reserves (foreign currency deposits and bonds), gold reserves, special drawing rights and other reserve positions at the International Monetary Fund (IMF). The main reserve currency is the US dollar, and to a lesser extent the euro, the pound sterling, and the Japanese yen.

In theory, international reserves are not needed under flexible exchange-rate regimes. However, the end of the Bretton Woods era in the 1970s saw a strong growth in the demand for international reserves, which as a ratio to GDP climbed dramatically. From the 1990s onward, two factors exacerbated this trend: the deeper international financial integration of emerging countries – which increased exposure to volatile short-term inflows of capital subject to frequent sudden stops and reversals – and the generalization of export-led growth strategies. International reserves increased from 1,000 billion US dollars in 1990 to more than 10,000 billion US dollars in 2013, of which two-thirds were driven by emerging economies. Their sharp accumulation has resulted in large global imbalances.

In attempting to explain the high demand for international reserves by emerging economies, the conventional wisdom insists on self-insurance motives. The primary reason for a central bank to hold reserves is to protect the domestic banking sector, and domestic

credit markets more broadly, while limiting domestic currency depreciation. The need for such protection is necessary, given the multiplication of risks in more financially open economies, where potential currency mismatches and a combination of internal drains (runs from bank deposits to currency) and external drains (flight to foreign currency or banks) can place large demands on a central bank's foreign exchange reserves (Obstfeld et al., 2010).

This explanation has been contested by further studies showing that the relative weight of the determinants has changed over time, more particularly since the 1990s, when emerging economies switched from being net international debtors to net creditors (Delatte and Fouquau, 2011). The precautionary motives have faded away in favour of mercantilist motives, which rely on sterilized interventions by the central bank to maintain an undervalued currency and defend export competitiveness (Aizenman and Lee, 2007). Recent explanations of the reserve-stocks dynamics in the modern era of globalized capital markets insist on the size of domestic financial liabilities that could potentially be converted into foreign currency (M2), financial openness, the ability to access foreign currency through debt markets, and exchange-rate policy.

The debate over the cost of international reserves is ongoing (see for instance Ghosh et al., 2012). Rodrik (2006) estimates the cost of holding international reserves at close to 1 per cent of GDP for all developing countries. By contrast, Levy Yeyati (2008) argues that the cost of central bank interventions tends to vary considerably. In the end, the conventional view that reserves are costly, owing to wide sovereign spreads or heavy quasi-fiscal losses, appears to be somewhat overstated.

It is true that if we refer to the Guidotti–Greenspan IMF rule, emerging countries accumulate excessive international reserves. According to this rule, countries should have no more than what is needed to meet a massive withdrawal of short-term foreign capital. Yet international reserves held by emerging central banks are much higher than their short-term external debt (maturity of one year or less), implying a ratio of reserves to short-term debt greater than one.

The global financial crisis, however, has demonstrated the usefulness of such a strategy, especially if associated with a less open capital account (Bacchetta et al., 2013). Results of empirical studies suggest that countries with high international reserves relative to short-term debt suffered less from the crisis under the presence of capital controls (Bussiere et al., 2014). Another unresolved puzzle is that emerging economies have been accumulating reserves without reducing their levels of debt. This behaviour is puzzling precisely because these economies could also decrease their vulnerability by decreasing their external debt.

From a post-Keynesian perspective, the accumulation of international reserves is expensive for developing countries and deflationary for the global economy: it reduces global demand, output and employment. If many developing countries pursue this accumulation strategy at the same time, they generate a “fallacy of composition” that feeds into global imbalances: they generate a current-account surplus and an additional demand for safe assets that is contractionary on the world economy, unless it is matched by a current-account deficit and a supply of assets by the issuer of the international reserve currency (Carvalho, 2010). Capital controls would be a better option. However, the best alternative would be the organization of an international monetary system based on a true international or supranational currency.

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See also:

Bretton Woods regime; Capital controls; Capital flight; Dollar hegemony; International Monetary Fund; International settlement institution; Sterilization; Sudden stops.

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International settlement institution

An international settlement institution does not exist yet. It is needed, however, in order for any payment across two currency areas to be final for the countries concerned by it, namely the payer country and the payee country. The logical reason supporting the creation of such an institution stems from the nature of money, which is an acknowledgment of debt by the bank issuing it in payment of any transaction. As no economic agent can pay finally by issuing his own acknowledgment of debt logically and as a matter of fact, non-bank agents need to obtain a means of payment from a non-agent in their transaction. This non-agent is a bank, which issues the number of money units required in order for the paying agent (a purchaser of a good, service or asset) to discharge her/his debt against the payee (another agent, who has sold a good, service or asset to the former agent). The same logic applies to any kind of banks, including central banks: banks need a non-agent, in the form of the domestic central bank, in order for their payments to be final on the interbank market. This means that any payments between two central banks in different currency areas require an international settlement institution (a supranational bank for central banks) in order for the relevant payment to be final for the two countries involved thereby. Payment finality means that, once the payment has been carried out by the relevant settlement institution, the payer has no further debt to the payee, who has therefore no further claims on the payer (Goodhart, 1975 [1989], p. 26).

In the history of economic thought, different authors have pointed out the importance of an international settlement institution to guarantee monetary order. The initial, and most well-known, economist proposing to reform the international monetary regime in that regard is John Maynard Keynes. In his now famous "Proposals for an International

Clearing Union”, Keynes (1942 [1980], p. 168, emphasis added) suggested setting up an international settlement institution in order for it to issue “an instrument of international currency having general acceptability *between nations* [. . .]; that is to say, an instrument of currency used by each nation in its transactions with other nations, operating through whatever national organ, such as a Treasury or a central bank [. . .], private individuals, businesses and banks other than central banks, each continuing to use their own national currency as heretofore” (in this perspective, see also Schmitt 1973, 1975, 1977, 1984, 1985, and Davidson 1982, 1992–93).

At the global level, the International Monetary Fund could and should also operate as an international settlement institution, issuing a supranational currency to be used only by national central banks in the final payment of international transactions (that is, transactions between nations, each represented by its central bank) across different monetary spaces. This would contribute to reducing the so-called “global imbalances” between China and the United States, in so far as it would lead the creditor country (China) to spend its positive balances at the international settlement institution in payment of commercial imports from debtor countries, notably the United States. The rebalancing of foreign trade would thereby be expansionary rather than being a factor of economic contraction, as this occurs when the United States reduces its imports in order to limit its trade deficits (see Piffaretti and Rossi, 2012).

At the European level, the European Central Bank (ECB) could and should operate also as an international settlement institution within the euro area, allowing its member countries to issue their own national currencies for domestic payments. This would enable these nations to recover their monetary sovereignty, which provides an important economic policy tool in the form of interest and exchange rates, particularly in times of crisis, whilst making sure that any debtor and creditor positions within the euro-area-wide payment system (TARGET2) are finally paid through the issuance of supranational currency units by the ECB (see Rossi, 2012). Unfortunately, as Rowley and Hamouda (1989, p. 2) cogently pointed out long ago, “[t]he attendant complacency restrains our willingness to accept both novel proposals and the revival of older views, previously rejected for adoption in different situations of the world economy, even though such deviations from fashion might provide important ingredients for solutions to our present difficulties”.

SERGIO ROSSI

See also:

Bancor; Bretton Woods regime; Dollar hegemony; European Central Bank; International Monetary Fund; Keynes Plan; TARGET2 system.

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Investment banking

Separate investment banks and investment banking as an aspect of universal banks are most appropriately conceived of as a problem for central banks rather than always a specific regulatory responsibility of a central bank. Central banks have tended to focus on price stability. In so far as price stability has been the main focus, until the global financial crisis that erupted in 2008, central banks have tended to put less emphasis on maintaining financial stability, on the basis that price stability implied financial stability. Investment banking tends to create periodic problems of financial stability, which central banks are then required to manage to prevent contagion.

The definition of investment banking tends to focus on the traditional range of services provided to clients (Iannotta, 2010). These include advice on financing (issuing stock or bonds), the organization and administration of an issue (including matters of regulatory compliance and marketing), and acting as underwriters of the issue. The bank might also offer services in relation to mergers and acquisitions, and provide an in-house market analyst service for clients.

The reality of investment banking since the mid 1970s has been more complex. Increasing competition between the banks and an emerging regulatory regime, combined with new technology, have enabled the banks to take on a greater range of actual roles, and have changed the profit dynamics of investment banking. Banks began to participate in new markets, such as high-yield (junk) bond production and dissemination, began to offer new services to clients, such as hedging products, and as a corollary began to develop financial innovations that became new forms of financial instruments and products (derivatives and so on) (Sundaram and Das, 2010), and began to provide services to, and also operate their own versions of, alternative investment organizations (Stowell, 2012).

Investment banking became global in its extent and increased its concentration via mergers and takeovers. Furthermore, investment banking began to diversify its potential revenue streams, whilst also creating convergent forms of behaviour as the banks collectively trended on specific new markets, practices and products. This generated opportunities to earn fees but also followed an evolution, from investment banks offering market-making services to engaging in proprietary trading, and employing their own sub-units and desks of traders.

In many respects, a modern investment bank has come to resemble a hedge fund more than it does the traditional image of an underwriter and adviser. This analogy, however, is limited (Berman, 2010), because an investment bank lacks the strict contractual terms for investment strategies a hedge fund might enter into with its investors, and because an investment bank is diversified in its strategies and practices, and does have clients rather than simply passive investors. Investment banks have, however, shared with hedge funds a tendency to be leveraged, the tendency (in the absence of a retail arm) to have a thin capital base, and the tendency to constantly exceed, and often seek to evade, the regulatory reach of relevant oversight bodies.

The United States best illustrates the issues that arose prior to the global financial crisis. For example, by 2007 the US's fifth-largest investment bank, Bear Stearns, was heavily leveraged and dependent on securitization. As this market became dysfunctional Bear Stearns began to report writedowns. Investment banks had no direct access to the Fed discount window in the US system. The Fed was forced to respond by offering additional liquidity to the finance system, and invoked provision 10b5 of the Federal Reserve Act enabling lending to any US corporation if the US economy is threatened. The Fed was then able to underwrite a private buyout of Bear Stearns by JP Morgan. The problem highlighted by Bear Stearns was that investment banking had the capacity to create impacts across the financial system because of the scale, interconnection, and diversity of practices. The failure to orchestrate a private rescue for Lehman Brothers on 13–14 September 2008 starkly illustrates this.

Since 2008, the relation of central banks to investment banks and the role and position of investment banks have begun to alter and be rethought. The failure of Lehman Brothers resulted in the rapid restructuring of US investment banks. All faced the same problem of a thin capital base, destabilized proprietary trading convergences, exposure to complex securities, and suspicion from potential counterparties. By the end of September 2008, none of the main US investment banks existed in its original form. The current issue in terms of investment banking is the degree to which potential adverse consequences are likely to be forestalled by regulatory changes. Investment banking now features high on the agenda for monitoring the financial system for macro-prudential purposes, advocated through the Bank for International Settlements.

The focus is, for example, repeated on a regional and national scale by the creation of new oversight agencies, some of which are located within central banks. For example, the new Financial Policy Committee at the Bank of England is charged with the duty of tracking financial stability. It is addressed also through legislative moves, such as the Dodd–Frank Act in the United States, and the proliferation of European directives.

As many have noted, central banks are just one authority that now confronts the challenge of dealing with the underlying motivations of modern investment banking. Issues of lobbying to dilute and delay new regulation have become a persistent problem, as has the further issue of what it means to comply and whether in fact it is possible to subvert the intent or evade the jurisdiction of a given regulator. In this regard, there is an ongoing debate concerning the significance of Basel III and new initiatives such as the Volcker rule and living wills (Cannata and Quagliariello, 2011). This in turn is being played out against a steady drip-feed of scandals within banking, such as LIBOR manipulation. Whether the rethink regarding investment banking will translate into constructive reform

of the regulatory architecture has yet to be genuinely tested. One might further place this in terms of developments of Keynes's work for global issues of financial capitalism (Bibow, 2009).

JAMIE MORGAN AND BRENDAN SHEEHAN

See also:

Basel Agreements; BIS macro-prudential approach; Contagion; Financial crisis; Financial innovation; Financial instability; LIBOR.

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K

Kemmerer, Edwin Walter

The American economist Edwin Walter Kemmerer (1875, Scranton, PA – 1945, Princeton, NJ) stands out as a key figure in the history of money and banking throughout the world, and especially in Latin America, for the role he played as a “money doctor” (see Dalgaard, 1982; Drake, 1989; Eichengreen, 1989; Rosenberg, 1999). During the first three decades of the twentieth century, he travelled to over 15 countries, most often accompanied by a group of experts, on what were known as the Kemmerer missions. Their aim was to solve problems related mainly to monetary standards and central banks. In his autobiography, Kemmerer (n.d.) explains how he became known as a “money doctor”.

During his academic studies at Cornell University, Kemmerer worked extensively on the quantity theory of money (Gomez Betancourt, 2010a). It was the subject of both his master thesis and his doctoral dissertation, which he finished in 1903 and published in 1907. In 1903, Kemmerer received a telegram from his former doctoral supervisor, Jeremiah Jenks, asking him to become a member of an American commission that had been established to implement monetary reforms in the Philippines. It was this first position in the US Philippine Commission, for which Jenks and Charles Conant recommended him, and which he held from 1903 to 1906, that launched Kemmerer’s career as a money doctor. After this, he served as economic advisor in various colonies, namely in the Straits Settlements, the Philippines and Puerto Rico. He then worked as head of various commissions charged with developing central banks and gold-standard systems in Mexico (1917), Guatemala (1919, 1924), Colombia (1923, 1930), the Union of South Africa (1924–25), Germany (1925), Chile (1925), Poland (1926), Ecuador (1926–27), Bolivia (1927), China (1929), Peru (1931), and Turkey (1934).

Kemmerer also taught economics at Cornell University from 1906 to 1912, and at Princeton University from 1912 until his retirement in 1943. In addition to being a famed scholar and researcher, he was a professional economic analyst and a well-known public personality. He was in direct contact with both Democrat and Republican presidents of the United States, as well as with ministers of Finance, Treasury officials, high-placed civil servants and a number of businessmen.

His experience as a foreign adviser, his excellent grasp of monetary theory and the political relations he maintained with influential people, led him to participate in the US banking reform debate and contribute to the establishment of the Federal Reserve System (Gomez Betancourt, 2010b). In 1916, he published *The ABC of the Federal Reserve System*, a very successful book that was reprinted 12 times. In this book, Kemmerer outlined the main shortcomings of the American National Banking System, which justified the creation of the Federal Reserve. Among the most problematic issues were the decentralization and rigidity of banks’ reserves, the inelasticity of the supply of banknotes and deposits, as well as the absence of an organized system for domestic and international transfers. He also drew attention to the political role of the central bank and the necessity for all sectors of the economy to be represented on the board of the monetary authority.

Kemmerer understood the nineteenth-century debate between the Currency School

and the Banking School very well. He was also highly influenced by Ricardo's quantity theory of money. Like Ricardo and the Currency School economists, Kemmerer considered gold movements to be necessarily caused by monetary policy, such as overissuing. However, the central bank that Kemmerer envisioned was different from the one advocated by Ricardo. Kemmerer (1944) insisted that flexibility in the money supply and having a lender of last resort were both important and necessary for the banking system.

In Kemmerer's view, a country's specific needs and conditions determined what type of gold standard it should adopt. According to Kemmerer, as the gold-exchange standard requires neither gold-coin circulation nor gold reserves, it remains the most economical of all standards. Kemmerer took for granted that rich countries would opt for a gold-coin standard whereas poorer countries would choose a gold-exchange standard, leaving those countries that are in an intermediary position the option of choosing a gold-bullion standard. Kemmerer played a central part in promoting gold-exchange standard systems and convincing the public opinion of the advantages of these systems. In so doing, he contributed to model the financial institutions in his own country and in many others.

Kemmerer wrote a large number of books and papers, which were published in the most prestigious journals of his time, such as the *Quarterly Journal of Economics*, the *Journal of Political Economy* and the *American Economic Review*. He helped to establish this last journal as co-founder of the American Economic Association, of which he also became president in 1926. Most importantly, he was a crucial member of the twentieth-century's first generation of American economists, along with John Bates Clark, Irving Fisher and Frank William Taussig.

REBECA GOMEZ BETANCOURT

See also:

Banking and Currency Schools; Federal Reserve System; Lender of last resort; Money doctors; Quantity theory of money; Ricardo, David.

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Keynes as monetary adviser

As early as 1913, in *Indian Currency and Finance* recognizing the quality of Britain's responsible international leadership in the pre-war gold-standard regime, Keynes advanced a proposal intended to transform the pre-war regime into a cheaper and more stable system, by economizing on the holding of international reserves, to the benefit of peripheral and new nations (Keynes, 1971–80, vol. I). His attention was devoted to the problems faced by debtor countries, which would subsequently be at the centre of his analysis. After elaborating a series of proposals aimed at alleviating the burden of debtor countries in the hope that surplus countries would allow the adjustment mechanism to operate, Keynes finally designed a new international monetary system requiring creditor countries to assume responsibility for global imbalances, by directly involving creditor countries in managing that system in such a way as to discourage *rentier*-like behaviour at the international level.

While criticizing the antisocial, *rentier*-like attitude of creditors in the post-war gold-standard regime, Keynes showed awareness of the problem of guaranteeing national autonomy (“policy space” in modern jargon) in a global order. A reasonable strategy from the point of view of the individual country, mercantilism (as he argued in *The General Theory* – Keynes, 1971–80, vol. VII, pp. 349, 382–3) could not provide a satisfactory generalizable solution to the “dilemma” of the international monetary system he had exposed in *A Treatise on Money* (Keynes, 1971–80, vols V–VI): an irreducible conflict between international discipline (policies intended to attract foreign capital) and national autonomy (as regards interest rate and foreign lending).

For Keynes, the solution should come from a new international monetary architecture explicitly designed to help member countries face their economic uncertainties. This means adopting the *General Theory* policy of regaining control over the long-term interest rate and helping both the country adopting an adequate interest rate and its neighbours to achieve full employment.

This required, first, that the long-term interest rate should be kept as low as possible, by reducing liquidity preference. Indeed, in his 1933 “National self-sufficiency” paper, Keynes wrote that “the transformation of society [. . .] may require a reduction in the rate of interest towards vanishing point within the next thirty years” (Keynes, 1971–80, vol. XXI, p. 240). He argued that a low rate of interest was fundamental to economic activity as well as to the repayment of debt. Orthodox economic theory argues that variations in interest rates are beyond human control. For Keynes, the rate of interest was “a highly conventional [. . .] phenomenon” that depends “on social practices and institutions” (Keynes, 1971–80, vol. VII, pp. 203, 240).

Second, this required that “reasonable” creditors act in such a way as to avoid frustrating the “self-respect and self-interest” (Keynes, 1971–80, vol. XVIII, p. 384) of debtors. Third, a preliminary consensus on each country's right to design its own path to development and economic growth was needed. These were the three theoretical pillars of Keynes's project of an International Clearing Union (ICU).

To avoid the fatal flaw of the *laissez-faire* international order (that of throwing the entire burden of the adjustment on debtor countries), Keynes's system imposed symmetrical obligations in this regard: creditor countries should renounce the financial power that derives to *rentier* nations, in exchange for enhanced potential demand for the products of their industrial capacity.

Contrary to both the technocratic nature of the Washington Consensus attempted order and the “spontaneous” evolution that led to Bretton Woods II, Keynes’s constructivism rests on acute awareness of the complexity of international economic relations and on his understanding of how pieces of the global economy interact, driven by the policies of autonomous nations (Vines, 2003; Carabelli and Cedrini, 2010).

Keynes’s international economic order not only accepted, but should also have protected each country’s freedom of action. In his individualistic but anti-economist ethics, political economy is an instrument to create the material preconditions to enjoy the ultimate aim of a good and happy life of Aristotelian flavour. Keynes praised the autonomy of individual judgment and wanted public institutions to protect such autonomy from the evils associated with social complexity and uncertainty, also at the international level (Keynes, 1971–80, vol. VII, p. 380; Carabelli and Cedrini, 2011).

Keynes wanted to safeguard each country’s right to pursue full employment policies, and to freely choose the means of attaining this result. Hence Keynes’s belief that capital controls were to be an essential feature of the new flexible exchange-rate system envisaged in the ICU plan. Keynes was the real father of the “embedded liberalism” philosophy: his was a defence of heterogeneity and variety, which at the international level are synonyms of “policy space” (see Carabelli and Cedrini, 2010).

Keynes offers a fully social vision of creditor–debtor relationships, which rests on the key concept of shared responsibilities, the only available principle on which to base a global order respecting “the proper liberty of each country over its own economic fortunes” (Keynes, 1971–80, vol. XXV, p. 11). In spite of the final rejection of his reform plans at Bretton Woods, Keynes defended the need of a new intellectual consensus for a new global order in the post-war world. This stands in contrast to the developments of the recent international economic disorder (Carabelli and Cedrini, 2015). His greatness as an international economist and monetary adviser owes to the attempt to construct a global order starting from the identification of a national behaviour that can lie in harmony with the interests of the system, and at the same time in characterizing such behaviour as that of a country freely pursuing full employment policies and helping, by this same means, other nations to do so.

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See also:

Bancor; Bretton Woods regime; Capital controls; Euro-area crisis; International reserves; International settlement institution; Keynes Plan.

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Keynes as monetary theorist

Money is at the centre of Keynes's economic theory and policy recommendations, as testified by the titles of his major works: *A Tract on Monetary Reform* (Keynes, 1923 [1971]), *A Treatise on Money* (Keynes, 1930a [1971]; 1930b [1971]), *The General Theory of Employment, Interest and Money* (Keynes, 1936 [1973]).

There are two contributions for which Keynes stands out as a revolutionary thinker who brought about a profound change in the understanding of the functions of money and the working of a monetary economy: the conception of the rate of interest as a monetary phenomenon and the role of money as a store of value.

The principle of effective demand, the cornerstone of the Keynesian revolution, rests on the rejection of the (classical) idea that saving determines investment with the rate of interest as the equilibrating force. Keynes's argument, on the contrary, is that there is no market that conveys whatever is saved into investment, for the cause-and-effect chain at work in the economy runs in the opposite direction: investment determines saving, via changes in the level of income, through the working of the income multiplier. So the determination of the rate of interest is displaced from the goods market to the money market, where the liquidity preference schedule meets the supply of liquidity.

In light of Keynes's approach, one can see that there is a dual decision process going on in the economy: the first kind of decision concerns spending or not spending (out of a given income or as an autonomous expenditure); the second kind of decision concerns the allocation of savings between liquid and non-liquid assets. Money, in its function as a store of value, is involved in both steps: by allowing separation of the act of spending from that of not spending, and by providing the abode of saving. Saving in the form of money-hoarding is explained by the peculiar characteristics of money: Keynes – unlike the majority of monetary economists – did not consider money as a mere means of payment or unit of account (the veil over the real transactions that are determined as in a barter economy) but emphasized the role played by money as a store of value within the capitalist economy. Money is never neutral in Keynes's approach.

Holding money as a store of value is explained as a safeguard against the uncertainties of the future in general, and of the future course of the rate of interest in particular: "The possession of actual money lulls our disquietude; and the premium which we require to make us part with money is the measure of the degree of our disquietude" (Keynes, 1973, p. 116).

Money is the most liquid asset, which affords protection against uncertainty, and the rate of interest is a liquidity premium; that is, the reward for parting from liquidity. High interest rates are both symptom and cause of liquidity preference: uncertainty and lack of confidence may induce a fall in economic activity (as occurred, for instance, in the inter-war period), fuelling further disincentive to investment and expenditure in general. That is why holding money as a store of value can open the way to depression and unemployment, and why monetary policy is called upon to make sure that liquidity is provided for and the markets expect it to be made available.

To be sure, Keynes's monetary theory has been a source of inspiration for many recent developments in central banking aimed at restoring financial markets' liquidity. His recommendations are, sometimes unconsciously, at the basis of the new instruments

of monetary policy designed to counteract the current global financial and economic crisis: the large-scale purchase of Treasury bonds with a view to lower long-term interest rates (“quantitative easing”), the need to pay attention to expectations even more than to policies (forward guidance), and the idea of imposing negative interest rates on idle money balances in order to provide an incentive for circulation (overcoming the zero lower bound for nominal interest rates).

According to Keynes, however, expansionary monetary policies might suffice to discourage the hoarding of money but not, in all likelihood, to prevent it. The problem was not psychological but institutional. Money was hoarded, because money was hoardable. Hence, for Keynes, it was necessary to reform the monetary system, rather than merely adjust the stance of monetary policy, in order to make money a pure means of payment and unit of account, limiting its role as a store of value.

Accordingly, in the plan for the post-war economic order that Keynes elaborated on behalf of the British government, he proposed to introduce a new international currency called *bancor*. As its name suggests, the *bancor* was inspired by bank money; yet, unlike bank money, it was not intended to be issued by private banks but by a central institution. In this respect, the *bancor* was similar to fiat money; unlike fiat money, however, it was not a liability of the issuing institution, but appeared simultaneously as an asset on the account of the creditor and as a liability on the account of the debtor.

Keynes’s proposal to reform the international monetary system after World War II was therefore consistent with his theory of money. The *bancor* was supposed to be an international currency subject to artificial carrying costs: whoever earned it and did not spend it would gradually lose it. The *bancor* would thus have been perfectly consistent with Keynes’s definition of the nature of money as “a mere intermediary, without significance in itself, which flows from one hand to another, is received and is dispensed, and disappears when its work is done from the sum of a nation’s wealth” (Keynes, 1923 [1971], p. 124).

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See also:

Bancor; *Bank money*; *Effective lower bound*; *Fiat money*; *Financial crisis*; *Forward guidance*; *International settlement institution*; *Keynes Plan*; *Money and credit*; *Money neutrality*; *Negative rate of interest*; *Quantitative easing*; *Zero interest-rate policy*.

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Keynes Plan

The Keynes Plan is an ambitious scheme of international reform devised by the British economist John Maynard Keynes and proposed as a basis for the negotiations of the Bretton Woods post-war order. The scheme aimed at organizing a new international payments system that, by forcing creditor countries to recognize their responsibilities for solving trade imbalances, could remedy the failures of the inter-war gold standard and revamp free and multilateral global trade. The first draft of the plan dates back to September 1941, when Keynes's memorandum on "Post-war currency policy", followed by a shorter document entitled "Proposals for an International Currency Union", was circulated within the British Treasury.

In general, Keynes believed that the "intensive laboratory experiment" of the inter-war period had offered unsatisfactory approaches to the "secular international problem" (Keynes, 1971–80, vol. XXV, p.21) of disequilibria in the balance of payments, which only the reasonableness of Britain as world creditor and leader had succeeded in solving during the harmonious pre-war gold standard. In Keynes's view, there had been only one successful attempt, after the First World War, to get rid of those "laissez-faire currency arrangements whereby a country could be bankrupted, not because it lacked exportable goods, but merely because it lacked gold" (Keynes, 1971–80, vol. XXV, p.12). Keynes had in mind the system of bilateral payments agreements with capital controls established by Hjalmar Schacht, Hitler's Minister of economic affairs between 1934 and 1937, with European and Latin American countries, to conduct trade without foreign exchange, as an international barter centred on Berlin. What Keynes found revolutionary in the "Schachtian system", admittedly a source of inspiration for his own plans, was the clearing principle on which it rested.

In Keynes's scheme, the International Clearing Union (ICU) multilateralizes international imbalances. The ICU issues a newly created bank money (bancor) as the new international unit of account destined to serve as the ultimate reserve asset of the system. Bancor can be held only by the central banks of participating member countries and be exchanged between national central banks and the ICU itself (so that individuals cannot hoard it as a store of value). Member countries therefore keep their national currencies domestically, but are assigned a current account denominated in the new standard, without having to previously subscribe capital to the institution. The idea behind the plan is to apply to the international level an essential principle of banking, which applies domestically; that is, "the necessary equality of credits and debits, of assets and liabilities. If no credits are removed outside the banking system but only transferred within it, the Bank *itself* can never be in difficulties" (Keynes, 1971–80, vol. XXV, p.44). Each nation can draw up to its own bancor quota, equal to half the average value of its total trade for the last five pre-war years. Deficits and surpluses are settled through centralized clearing accounts: the ICU grants credit in the form of overdraft facilities that finance trade deficits and thereby help global trade to expand on multilateral bases. The ICU can thus create reserves in such an amount as to accommodate the needs of international trade from surplus to deficit countries.

Ultimately, however, the plan aimed at reabsorbing imbalances (Fantacci, 2013). This required that creditors should share the adjustment burden with debtor countries, as the only possibility to "make unnecessary those methods of restriction and discrimi-

nation which countries have adopted hitherto, not on their merits, but as measures of self-protection from disruptive outside forces” (Keynes, 1971–80, vol. XXV, p.449). Therefore, the scheme allows and, the case being, requires creditor countries to revalue their currencies and unblock foreign investments. Credits exceeding a quarter of their quota in amount are charged rising interest rates; those exceeding the quota itself at the end of a year would have been directly transferred to the ICU. Symmetrically, debtor countries are allowed or asked to devalue their currencies, to sell gold and to prohibit capital exports; their excessive debts are charged interest, though lower than those applied to creditors’ excessive balances. The proposal therefore envisages fixed but adjustable exchange rates.

As Keynes himself observed, everything in his plan was ancillary to the re-establishment of multilateralism. To secure this result, Keynes believed it necessary to prevent *rentier*-like forms of behaviour, by making the possession of capital of little, if any, importance. Creditors were asked to use, or make available to deficit countries for purposes of adjustment, those resources that they may otherwise leave idle. But they would be free to choose how to employ surpluses – expansion of credit and domestic demand, wage increases, abatement of trade restrictions or foreign lending for development – and would gain access to wider markets, while exerting “an expansionist, in place of a contractionist, pressure on world trade” (Keynes, 1971–80, vol. XXV, p. 74; see also Davidson, 2009).

The holistic approach to the problems of international economic relations developed by Keynes throughout his work is responsible for his ambition to endow the world with a veritable “global macro-manager” (Skidelsky, 2005, p. 21). The ICU scheme included a series of ancillary international institutions engaged in combating the evils of the trade cycle, to be financed by extra overdraft facilities, transfers from the Reserve Fund of the ICU, and by direct contributions by surplus countries. Keynes envisaged a Relief and Reconstruction authority, a Board for International Investment or Development Corporation, a Super-national policing body, and a scheme for commodity stabilization (*Commod Control*). Firmly convinced that the new order “should not wander from the international *terrain*” (Keynes, 1971–80, vol. XXV, p.234, author’s emphasis), and be “consistent with widely different conceptions of domestic policy” (Keynes, 1971–80, vol. XXV, p. 621), Keynes supported capital controls as an essential feature of the desired new system, and wanted the mandate of Bretton Woods institutions to be technical rather than political.

The plan finally adopted at Bretton Woods (the International Monetary Fund, with its principle of subscribed capital, as guardian of global monetary stability) resembled the reform scheme elaborated by the US representative to the negotiations, Harry Dexter White. Keynes’s plan was vetoed because of its seemingly inflationist character and the threats to American supremacy represented by the *bancor* and the principle of creditors’ involvement in international adjustment. Keynes’s ideas and proposals, however, were the main driving forces that shaped the consensus on the “embedded liberalism” of the Bretton Woods order, and Paul Davidson’s proposal to change the current international payments system along Keynes’s lines (although updated) demonstrates the continuing relevance, at an epoch of global imbalances and crisis, of the still untested “Keynes Plan” (see for instance Davidson, 2009).

MARIO CEDRINI

See also:

Bancor; Bank money; Bretton Woods regime; Capital controls; International Monetary Fund; International settlement institution; Keynes as monetary adviser; Keynes as monetary theorist; Schacht, Hjalmar Horace Greeley; White, Harry Dexter.

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King, Mervyn

Mervyn King (1948–) is an economist specializing in public economics. He has been governor and chairman of the Monetary Policy Committee (MPC) at the Bank of England (BoE) for a whole decade (1 July 2003 – 30 June 2013). King's legacy bears a striking resemblance to that of his American counterparts; it is better understood by distinguishing the pre- from the post-2008 era.

Before the financial crisis that burst in 2008, King's tenure at the BoE appears to have been guided by beliefs not too dissimilar from those of Alan Greenspan at the US Federal Reserve. Indeed, King shared Greenspan's view that stabilization is better achieved in the long run by free markets' *laissez-faire*, market-based solutions, limited intervention and deregulation; in the short run, monetary policy is efficient and superior to any other policy. If anything, King's beliefs and actions place him closest to the New Keynesian school.

As a result of these beliefs, both King and Greenspan (and later Bernanke) failed to forecast and prepare for the 2008–09 crisis. In particular, King failed to see a bubble in house prices: in a BBC radio interview, he indeed claimed that "[w]e debated long and hard on the MPC as to whether house prices were at an unsustainable level, and we concluded they were not" (Aldrick, 2012).

King also failed to envision banks failing. New Labour had stripped the BoE of its bank regulatory powers in 1997, which King never seemed to miss until the crisis broke. As observed by David Blanchflower, a former member of the MPC, "[i]f Mervyn King had thought more regulation was important he could have done something about it. And because he did not he must take responsibility for the fact the Bank of England missed the biggest financial crisis in a century" (BBC, 2012). King rejected this criticism, however, arguing that research at the BoE on financial bubbles and fragility was one of the most advanced available at the time, but its results were simply not "shouted from rooftops" (see Bank of England, 2006).

After the crisis erupted in 2008, and no doubt pushed by events, King espoused a pragmatism that puts him closer to Bernanke. King tried his best to contain and manage the crisis as events unfolded, explaining that the crisis provided grounds for a "powerful case of more stimulus in the short run" (King, 2013, p. 3). In this framework, King first used

conventional monetary policy only and, by his own admission, was slow to cut interest rates, as if there was no urgency or as if markets would self-correct. Eventually King drove interest rates to near-zero levels and engaged in quantitative easing at a scale of a quarter of British GDP (Chu, 2013).

Interestingly for central bankers, neither Greenspan nor Bernanke nor King appeared overly concerned by excessive inflation rates, whether in asset or product markets. This contrasts with the experience at the European Central Bank, which has traditionally been more hawkish. Like his American counterparts, King presided over a huge run-up in asset prices, especially for real estate, but this led to no noticeable change in his monetary policy. Neither did the 4 to 5 per cent inflation spikes in 2008 and 2011. This puts into question the use of traditional inflation targeting strategies, whose implementation at the BoE we owe to King while serving as its chief economist. This also questions the use of Taylor rules since 2000, to which King subscribes (see King, 2013).

However, King's pragmatism came to an end as early as 2011 with his support of the fiscal consolidation agenda of the Cameron government: austerity in the face of feeble recovery and high unemployment rates. As Parker et al. (2011) noted, "[t]here has to be a Plan A. This country needs a fiscal consolidation starting from its largest peacetime deficit ever". This political alignment is a clear politicization of the chief central banker, which conflicts with the claimed and cherished independence of the central bank. Again, one finds in this regard a parallel with Greenspan, who similarly overstepped and advocated for fiscal conservatism during the early 2000s. Not only is this position arguably an economic mistake for King, but it was a clear political mistake as well, as his embrace of fiscal policy now placed him *de facto* responsible for all economic policy, therefore exposing himself as entirely responsible for the UK's lacklustre economic recovery.

Where King differs the most from his American counterparts is on banking policy and institutional reform. Faced with the Northern Rock bankruptcy, King first tried to follow Greenspan's Long-Term Capital Management footsteps, except that King failed to arrange for a market-based solution. Instead, the frailty of Northern Rock was heavily publicized (it had engaged widely in securitization), and when the bank called upon an emergency line of credit from the BoE in September 2007 (which King granted), insolvency rumours spread and led to the UK's first bank run since 1914 – a rarity in the international scene. Northern Rock ended up nationalized and managed by HM Treasury.

The market-based solution was eschewed a few months later, in September 2008, when the crisis broke. Instead, the British government announced a plan to recapitalize UK banks by taking equity in them (850 billion US dollars for the UK economy, versus 787 billion US dollars for the US economy). The two major British lenders required the government to buy so many shares that Lloyds and Royal Bank of Scotland became *de facto* nationalized. This is contrary to the American experience, where financial companies were allowed to fail or were bailed out with temporary loans.

Since that time, King has put in place a new discount-window lending scheme and has got his banking supervision powers back. While Greenspan did not radically change his views after the crisis burst in 2008, King has sought more regulation of the banking system, which City bankers did not appreciate, especially when it came to policing their bonuses (Pratley, 2013).

OLIVIER GIOVANNONI

See also:

Asset price inflation; Bank of England; Bernanke, Ben Shalom; Bubble; Carney, Mark; Central bank independence; European Central Bank; Financial bubble; Financial crisis; Greenspan, Alan; Inflation targeting; Quantitative easing; Taylor rule; Zero interest-rate policy.

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Lamfalussy, Alexandre

Alexandre Lamfalussy is perhaps best known as the first President of the European Monetary Institute (1994–97), which was the predecessor of the European Central Bank. Before that, he worked at the Bank for International Settlements (BIS), becoming an early advocate of its macro-prudential approach to financial stability.

Lamfalussy was born on 26 April 1929 in Kapuvar, Hungary. He started his Economics studies at the Budapest Polytechnic. In January 1949, he left Hungary and moved to Belgium, where he continued his studies at the Catholic University of Louvain. After that, he went to Oxford for his doctorate. In an essay on Europe's economic growth performance, Lamfalussy (1963) emphasized virtuous (versus vicious) circles, in which stronger export growth promotes higher investment, which in turn strengthens productivity and investment, further reinforcing exports. It made him one of the main protagonists of the Keynesian approach of export-led growth (Crafts and Toniolo, 1996).

In 1955, Lamfalussy started working at the Banque de Bruxelles, Belgium's second-largest commercial bank at the time, becoming Chairman of the Executive Board in 1971. Partly under the influence of Robert Triffin, Lamfalussy soon became interested in international and European monetary issues and was an early advocate of European (monetary) integration. However, in the "monetarist–economist" debate, he took a more balanced position than Triffin. Lamfalussy favoured a symmetric economic and monetary union, with a European economic government, implying significant transfers of sovereignty.

In January 1976, Lamfalussy joined the Bank for International Settlements, in Basel, Switzerland, as economic advisor, and from May 1985 until the end of 1993 he was the BIS General Manager. During his time there, in the early 1980s, there was a strong appreciation of the US dollar, owing to differences in the policy mix between Europe and the United States. For Lamfalussy, this was a clear indication that flexible exchange rates could not be relied upon to avoid serious exchange-rate misalignments. Moreover, that period highlighted the dangers of such disparities, especially strong protectionist threats.

Financial stability was a major topic of concern for Lamfalussy. As early as the mid 1970s, he was warning about an unsustainable debt build-up in Latin America (Maes, 2010). In 1979–80, a Working Party that he chaired advanced the case for a "macro-prudential" approach to banking regulation and supervision. In the 1980s, the BIS played a significant role in the management of the Latin American debt crisis. Lamfalussy (1985) took a cautious attitude towards financial innovations. His fundamental question concerned the effects on financial stability of the redistribution of risk by new financial instruments. Lamfalussy made a significant contribution to the creation of a "BIS approach", namely that one should be attentive to imbalances, debt build-ups and bubbles, which may sow the seeds of financial crises. Lamfalussy became an early advocate of the BIS "macro-prudential" approach to financial stability with a focus on the financial system as a whole, and not just on individual financial institutions.

During his time at the BIS, Lamfalussy was also a member of the Delors Committee (1988–89), which played a pivotal role in the European monetary unification process.

From January 1994 until June 1997, he was the first President of the European Monetary Institute (EMI). The main task of the EMI was the preparation of the final stage of the European Monetary Union (EMU), especially the single monetary policy and the introduction of the euro. Lamfalussy's advocacy of European monetary integration had its origin in two main sources: a profound European conviction, marked by the devastations of the Second World War and by the Iron Curtain, and a fundamental distrust of systems of floating exchange rates, in line with his general views on the functioning of financial markets. However, Lamfalussy underestimated the macroeconomic imbalances to which EMU would contribute, even if he was always an advocate of a stronger economic pillar of EMU (Maes, 2011).

In 2001–02, Lamfalussy became the Chairman of the Committee of Wise Men, which developed a new approach for the regulation of European financial markets. Lamfalussy further focused on financial stability. Lamfalussy (2004) discussed the organization of prudential supervision in the European Union, which he described as a “mind-boggling patchwork”. He stressed that central banks had a crucial role in the management of financial crises and that one should give a responsibility to the ECB in the supervision of the large, systemically important, banks. This was an early advocacy for a European banking union, which started to take shape only in 2012 in the wake of the financial crisis.

IVO MAES

See also:

BIS macro-prudential approach; Bubble; Euro-area crisis; European monetary union; Financial bubble; Financial crisis; Financial innovation; Financial instability; Macro-prudential policies; Systemically important financial institutions; Triffin, Robert.

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Law, John

John Law (1671–1729) was a Scottish entrepreneur, banker and economic thinker, who held high financial positions in France during the regency of Philippe d'Orléans. From 1716 to 1720 he ran a financial system in France that, apart from its historical relevance, had a theoretical relevance: for the first time in Europe an attempt was made to substitute gold and silver coins with token fiat money (in this case banknotes issued by a monopoly bank). Essentially, this was one of the first attempts to actively manage currency circulation and monetary policy. Gold (silver) coins were complemented with paper money

convertible into gold. The main purpose of this system was to stimulate the economy by increasing money supply and the supply of cheap credit. This was also an attempt to transform government debt papers into money; that is to say, into means of payment. According to Law, money itself is not wealth but a means to increasing wealth; that is, an instrument for turning it over.

Part of Law's ideas set forth in his book entitled *Money and Trade Considered with a Proposal for Supplying the Nation with Money* (1705) are considered as a prototype of modern discretionary economic policy (Murphy, 1996). Keynes, for example, regarded the Scotsman's theory highly. Law's system, put forward as a solution to the financial and economic crisis (huge public debts and destroyed budget) in France after the death of Louis XIV, became in itself a prototype of inflationary monetary policy and of speculative financial crises as we witness today. It is hardly a coincidence that Law's system is often referred to as a financial pyramid under the name of the "Mississippi bubble".

Historically, the system was launched in 1716 when Law founded a private bank (the "Banque Générale"), which in 1717 was granted the right to issue banknotes accepted by the State for payment of a number of fiscal obligations. A year later, in 1718, the bank became a royal bank (the "Banque Royale") and was granted a nine-year issuance monopoly. In parallel, in 1717 a joint-stock company was established under the name of the "Compagnie d'Occident" – a trade company that was granted a monopoly over France's external trade with the new transoceanic territories of Louisiana and her exploitation of the transoceanic territories. In the period 1719–20 the company expanded and took over the trade with other regions (China, Japan, Africa, India, and so on). In 1720, the bank and the company merged, with Law becoming "Contrôleur des finances", which was in practice the Minister of Finance.

Law's system (company and bank) became a mediator between the Treasury and its creditors. The Treasury debts ("*billets d'état*") were bought out by the company against the creditors acquiring shares in the company. These shares were strongly overestimated owing to expectations of high gains in the new territories. Basically, the shareholding capital of the company was a public debt, which was subsequently strongly reduced as a result of its nullification by the State. The sovereign debt thereby purchased was converted and consolidated into a new 3 per cent issue, which was very much to the advantage of the Treasury reducing the interest burden. In turn, against this debt the bank issued paper money. This way, paper money drifted further away from its gold coverage. In the bank's balance sheet, against the increasing money supply, the share of securities (government debts and company shares) grew at the expense of the share of precious metals (gold and silver).

In the spring of 1720, Law's system collapsed as a result of the desire of some key shareholders to convert the shares into paper money and then paper money into gold (some of these shareholders were Law's adversaries and opponents of the system). When the prices of the company's equities soared as a result of agiotage, it became suddenly clear that the prospect of profiting from these companies was highly overestimated and speculative. Conversion into precious metals proved illusory and the system collapsed. In October 1720 the paper money was withdrawn from circulation. On the whole, Law's system caused the private sector to suffer big losses; yet in a sense it had its positive side as it cancelled the government debts.

An interesting fact to note is that another eminent economist from that period,

Richard Cantillon, was actively involved in Law's system; foreseeing its crash, however, he converted his shares into paper money and left in good time.

NIKOLAY NENOVSKY

See also:

Bank money; Bubble; Fiat money; Financial crisis; Money and credit; Money supply.

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Lender of last resort

A lender of last resort (LLR) is an institution that provides liquidity to the financial sector, and more broadly to the whole economic system, when a crisis occurs.

Both the historical origin and the theory of the LLR date back to nineteenth-century England. At that time, under a currency regime characterized by fixed exchange rates and the gold standard, the central bank lent to banks that had liquidity problems because of unexpected high cash outflows or low cash inflows, owing to real causes such as a bad harvest that would hinder the payment of maturing bills accepted and/or discounted by these banks or a bank run on deposits or both phenomena at the same time. Those banks that would not otherwise be able to satisfy the requests of deposits withdrawal would indeed be helped by such an action and the panic that usually spreads to other financial institutions would thereby be stopped.

On similar historical occasions, the central bank lent its own notes. The expansion of its note issue, however, was linked to the gold reserves available, and under the international gold standard the central bank had to act carefully in order to avoid excessive gold outflows from the country.

According to Humphrey and Keleher (1984), the role of the central bank in that historical framework was to prevent credit crises and the associated runs on specie reserves from affecting the long-run monetary objectives of the central bank. In normal conditions, however, the sole expectation that the central bank would stay ready to intervene would stop the panic and often avoid its intervention.

In a small open economy under flexible exchange rates, or a closed economy, monetary and price-level stability would become a target of monetary policy. Even under flexible exchange rates, however, given fractional reserve banking and government monopoly of legal-tender issuance, possible dangers of collapse of the banking system were present and the function of the LLR then became that of preventing banking failures from affecting the money supply. Thus, according to Humphrey and Keleher (1984), both in a fixed and in a flexible exchange-rate regime the task of the LLR was to ensure monetary stability.

In order to avoid moral hazard, emergency lending by the central bank should be given only under certain conditions. Bagehot's (1873) recommendations were to lend freely to illiquid but solvent banks, at high rates of interest, and against good collateral.

Many debates have arisen about whether it is actually possible to distinguish solvent from illiquid banks during a crisis, about the opportunity of lending at high rates of interest to distressed entities, and about the actual meaning of good collateral. The idea underlying the Bagehot (1873) recommendations was that the central bank should not lend to insolvent institutions, which should rather be resolved, but should lend to solvent institutions in order to avoid them suffering from liquidity problems and thus the whole money stock from contracting. The idea was that the central bank must act very early, before the crisis emerges, in order for the LLR to be successful.

According to Mehrling (2011), the US Federal Reserve (Fed), during the financial crisis that began in 2007, would have fulfilled the same role as the Bank of England in the nineteenth century. The web of interlocking debt commitments would be like a bridge that we collectively build outwards into the unknown future, and the central bank would watch over the construction of that bridge at the edge between present and future. The central bank should repair the bridge when needed. The Fed was thereby compelled to become a dealer of last resort and in the future it should become an insurer of last resort.

Other scholars (see Wray, 2013) argue instead that the Fed in its intervention did not abide by the criteria cited by Bagehot (1873), and in fact lent for long time to insolvent institutions at very cheap rates of interest and against bad collateral, thus providing a subsidy to them.

A compromise between these two contrasting positions would be to admit that the central bank intervention happened too late to avoid the contagion and to be able to distinguish between solvent and illiquid institutions (see Tropeano, 2010). Moreover, the advice by Bagehot (1873) to lend on as large a scale as the public asks was based on the idea that unsound people were a feeble minority:

That at this rate these advances should be made on all good banking securities, and as largely as the public ask for them. The reason is plain. The object is to stay alarm, and nothing therefore should be done to cause alarm. But the way to cause alarm is to refuse someone who has good security to offer. The news of this will spread in an instant through all the money market at a moment of terror; no one can say exactly who carries it, but in half an hour it will be carried on all sides, and will intensify the terror everywhere. No advances indeed need be made by which the Bank will ultimately lose. The amount of bad business in commercial countries is an infinitesimally small fraction of the whole business. That in a panic the bank, or banks, holding the ultimate reserve should refuse bad bills or bad securities will not make the panic really worse; the 'unsound' people are a feeble minority, and they are afraid even to look frightened for fear their unsoundness may be detected. *The great majority, the majority to be protected, are the 'sound' people*, the people who have good security to offer. If it is known that the Bank of England is freely advancing on what in ordinary times is reckoned a good security on what is then commonly pledged and easily convertible the alarm of the solvent merchants and bankers will be stayed. But if securities, really good and usually convertible, are refused by the Bank, the alarm will not abate, the other loans made will fail in obtaining their end, and the panic will become worse and worse. (Ibid., pp. 197–8, emphasis added)

This is perhaps the essential difference between Bagehot's times and ours. The great majority of people in Wall Street were not "sound" people when the financial crisis began in 2007, as the wave of lawsuits and accusations for fraud, mis-selling and manipulation of relevant indexes testifies.

The intervention of the central bank has of course increased the size of its balance sheet, though not the supply of broad money; and in any case it has not affected the

inflation rate. The important point, however, is whether, in order to promote stability, the central bank has to commit itself to fulfil any promise of payment made in today's complex and uncontrolled financial system without either caring about its origin or worrying about the infinite potential for the expansion of credit within the current financial system.

DOMENICA TROPEANO

See also:

Bagehot rule; Bagehot, Walter; Bank run; Cash; Central bank money; Collateral; Contagion; Financial crisis; Fractional reserve banking; International gold standard; Monetary policy in a small open economy; Money supply; Settlement system.

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Liability management

Commercial banks have a set of liabilities with a variety of maturities, risks and regulatory requirements. These banks, which have complex portfolios, have to meet the market in order to fundraise deposits, nondeposit borrowings, and wholesale funds in domestic and foreign markets. As Minsky (1991) highlighted in this regard, the central bank is the ultimate fallback refinancing institution.

Thus, liability management is related to banks' active management of net funds already available for lending and investment as well as the search for additional funds. Its aim is to collect sufficient funds to meet the bank's asset growth and earning targets at acceptable levels of risk (Saunders, 1994). Liability management involves strategies that reveal the banks' ability to refinance their positions without threatening their financial stability. This stability could be challenged by a longer maturity of assets than liabilities, by changes in regulation, and by market price volatility, among other factors.

According to Minsky (1991), the growth of alternatives to bank financing has not resulted mainly from competitive market forces. In his opinion, the role of both banking regulation and monetary policy has been decisive in explaining management changes in the commercial banks' balance sheets.

In the framework of the "New Deal" segmented system of financial regulation, commercial banks began to actively manage liabilities, in the 1960s, with the issuance of negotiable certificates of deposit, which could be sold in the interbank market, prior to maturity, in order for banks to raise additional funds. This financial innovation, which aimed to increase banks' nondeposit fundraising, configured new financial products also called near-money. As a result of the new trends in liability management, the

development of the federal funds market turned out to reduce the US Federal Reserve's ability to use legally required reserves to constrain bank lending (Minsky, 1982).

The growth of financial innovations has been deeply associated with liability management by profit-seeking banks that aim to subvert constraints imposed by financial regulation and monetary policy. Innovation, as Schumpeter (1912 [1934]) argued, is the key to capitalist development. Minsky (1991) considered that financial innovations are not just techniques or product phenomena but involve institutional changes because banks and their practices are also subject to innovation. As a result of liability management, banks can increase fundraising by creating new financial products. Such financial innovations could increase the amount of credit through the endogenous money creation of banking institutions, as the new loans are considered profitable.

According to Tobin (1963), commercial bank loans are not restricted by the previous amount of deposits because banks could be active in fundraising. As a matter of fact, innovative banks promote adjustments of assets and liabilities as a result of expected risks and returns. In fact, financial innovations, which characterize the active role of banks, prove to shape new interactions between banks and central banks. Banks could not only make ineffective a monetary policy based on quantitative rules but could also build a highly speculative debt structure in spite of the restrictions imposed by financial regulation, as Minsky (1986) warned.

Mainly after financial deregulation, liability management turned out increasingly to include risk management, such as liquidity, credit, interest rate and currency risk. Since the 1980s, acknowledging that many different types of risks are related and overwhelm assets and liabilities (Dermine and Bissada, 2007), banks have increasingly adopted an integrated approach called asset–liability management (ALM). ALM aims to look at how bank assets and liabilities can match up in the most effective way to mitigate risks, legally accomplish capital adequacy requirements, and achieve expected earnings. In fact, the Bank for International Settlements' banking regulation guidelines (Altman and Saunders, 2001) have fostered further banking innovations.

In practice, banks analyse the multiple risks to which they are exposed. On the assets side of their balance sheet, banks deal with the composition of discretionary portfolios, including loans, currencies, bonds, securities and other trading assets. Banks assess the magnitude of risks, owing to imbalances in the balance-sheet composition, and figure out how to mitigate them. For example, banks could be interested in asset securitization, so as to enhance credit and liquidity risk management. Besides, banks could change the maturity of their deposits when rapid shifts in the level of interest rates are expected. In this case, accounting methods, such as gap analysis or duration analysis, could also maintain a controlled gap between the maturities of assets and liabilities. ALM could also be used to analyse currency and other trading-related risks. As a result, financial innovations could include off-balance-sheet banking and hedging techniques, such as currency futures and swaps to control balance-sheet exposures. As a result, banks set aside additional capital for potential losses. These management practices are becoming increasingly similar whether an institution is chartered as a commercial bank, a savings bank, an investment bank, or an insurance company (Saunders and Cornett, 2002).

In this respect, Minsky (1986) argued that liability management could be apprehended in a changing historical framework where tensions between the regulation of capitalist finance and the strategies of innovative profit-seeking banks arise. Financial innovations

impact upon banks' assets, liabilities and capital. As a result, they could induce sudden changes in market dynamics, financial stability and central banks' actions. Indeed, in a framework of uncertainty and speculation, a set of interrelated portfolios and cash flows between banks, income-producing firms and households may influence the evolution of credit, the pace of investment, and the valuation of capital assets. The global crisis that erupted in 2008 showed that innovations regarding banks' liability management have reinforced the risks associated with individual banks or non-bank financial institutions as well as systemic risk. In other words, these practices have potentially materialized the risk of collapse of the financial system with deep negative consequences for the whole economic system. As a matter of fact, microeconomic liability management practices turned out to be non-neutral. Hence, these practices need permanent policy attention about prudential banking regulation and systemic risk.

MARIA ALEJANDRA CAPORALE MADI

See also:

Asset management; Carry trade; Endogenous money; Federal Reserve System; Financial innovation; Financial instability; High-powered money; Investment banking; Reserve requirements.

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LIBOR

The London Interbank Offered Rate (LIBOR) dates back to 1984, when the British Bankers' Association (BBA) was assigned to construct agreeable trading terms and a benchmark for the growing market in syndicated loans that had sprung out of the Eurocurrency market. The LIBOR was intended to reflect the rate at which banks were able to borrow from each other in the uncollateralized interbank money market. A benchmark was also needed for the increasing array of financial derivative instruments that had become frequent tools for hedging and speculation alike.

The success of the LIBOR in becoming the most important benchmark for the short-term interbank money market rate of interest resulted in the emergence of similar benchmarks in other financial centres, such as the Tokyo Interbank Offered Rate (TIBOR)

and the Euro Interbank Offered Rate (EURIBOR). Today, the LIBOR is used for a wide range of financial contracts, from derivatives (such as forward rate agreements and interest-rate swaps) and corporate loans to mortgages, credit cards and student loans. For instance, it has been estimated that loans amounting to 10 trillion US dollars, and 350 trillion US dollars of interest swaps, are indexed by the LIBOR (Commodity Futures Trading Commission, 2012). As the money market rate of interest should, theoretically, reflect current and expected future repo rates of interest, as well as credit and liquidity risk, the LIBOR has also had a prominent position in monetary economics as a symbol for the first stage of the monetary policy transmission mechanism (Stenfors, 2013).

The LIBOR is determined daily by a panel of large London-based banks in a range of major currencies for maturities up to one year. The actual fixing mechanism is straightforward. A designated calculation agent collects the submitted sealed quotes from the individual panel banks. During a short period, the calculation agent audits and checks the quotes for obvious errors and then conducts the “trimming” – that is, the omission of the highest and lowest quotes (whose number depends on the sample size). Thereafter, the arithmetic mean is calculated and published (British Bankers’ Association, 2012).

Although the LIBOR is an observable benchmark, the individually submitted LIBOR quotes do not need to correspond to the actual funding cost faced by panel banks. As the individual LIBOR submissions are not binding, the integrity of the benchmark is based upon the assumption that the banks reveal the truth.

Anecdotal evidence and allegations that the LIBOR, at times, had been systematically manipulated forced regulators in 2011 to launch wide-scale investigations into the LIBOR, and its equivalents in other financial centres (see Mollenkamp and Whitehouse, 2008). Subsequent revelations highlighted that LIBOR panel banks had means, opportunities and incentives to submit deceptive quotes, stemming from having large underlying LIBOR-indexed derivatives portfolios and facing the stigma attached to submitting a relatively high funding cost through the LIBOR fixing mechanism (Stenfors, 2013). Administrative action was initially taken by Japan’s Financial Services Agency (2011a, 2011b, 2011c) against UBS and Citigroup, and large fines were imposed upon Barclays and other banks by the UK’s Financial Services Authority (2012), the United States Department of Justice (2012) and the Commodity Futures Trading Commission (2012). Issues of internal conflicts of interest, as well as benchmark governance, were also raised, prompting lawsuits and an urgency by policy makers to reform the benchmark (HM Treasury, 2012).

ALEXIS STENFORS

See also:

Collateral; Investment banking; Repurchase agreement.

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Liquidity trap

The economic situation in a wide range of economies in the wake of the global financial crisis that erupted in 2008 is characterized by many as a liquidity trap. The original conceptualization of the liquidity trap was part of Keynes's (1936) theory of liquidity preference. It referred to a situation where the monetary authorities could not reduce the nominal long-term interest rate any further by selling bonds because of the near-universal expectation that interest rates were so low that they could only rise and bond prices fall.

There is the possibility [. . .] that, after the rate of interest has fallen to a certain level, liquidity-preference may become virtually absolute in the sense that almost everyone prefers cash to holding a debt which yields so low a rate of interest. In this event the monetary authority would have lost effective control over the rate of interest. (Ibid., p.207)

In principle, the liquidity trap could arise at any interest rate; the critical factor was that a conventional expectation should have been formed that interest rates would not fall further. Given that such a belief was formed under uncertainty, it was potentially volatile. But Keynes had proceeded to explain that, while a liquidity trap had occurred under special circumstances, it was in general unlikely.

Hicks's (1937) initial exposition of the IS–LM framework as a way of representing Keynes's *General Theory* included the liquidity trap as a horizontal portion of the LM curve at a low rate of interest. Modigliani (1944) later put a particular focus on the liquidity trap as capturing the essence of Keynes's monetary theory, which, together with downward stickiness of wages, could account for an unemployment equilibrium as a special case. While the neoclassical synthesis perpetuated this version of Keynes as a special case, fundamentalist Keynesians protested that the IS–LM framework seriously misrepresented Keynes, not least for putting such an undue focus on the liquidity trap rather than the more general issue of liquidity preference under uncertainty (see Davidson, 1972, for a full account of Keynes's monetary theory from a fundamentalist Keynesian perspective, in relation to the neoclassical synthesis). Indeed Hicks (1980–81) himself concluded later that the IS–LM framework had misrepresented Keynes's analysis. The liquidity trap concept thus sank into oblivion.

But the liquidity trap term experienced a resurgence (most commonly associated with Krugman, 1998) when it became a reality in Japan, where monetary policy was unable to lift the economy out of recession. Nominal interest rates had gone to zero, implying that logically (rather than as a matter of expectation) they could really only rise (in fact, in 1998, interest rates in the Japanese interbank market fell below zero). Now, since the crisis that began in 2008, an additional range of economies (including the United States and much of the euro area) have also been classified as being in a liquidity trap (Krugman, 2013). Interest rates are at historic lows, making it difficult for monetary authorities to reduce long-term interest rates further.

But, as Kregel (2000) argues, the basis for the liquidity trap is being understood, by Krugman and others, not in Keynes's terms, but in loanable-funds/monetarist terms. The concern therefore is that, in a deflationary situation, monetary authorities are unable to reduce the real rate of interest sufficiently for the market in loanable funds when nominal interest rates can fall no further. The only solution then is to engineer expectations of inflation through increases in the money supply. The problem is thus one of the zero lower bound rather than Keynes's liquidity trap, which could occur above that bound. For Keynes, the trap was that liquidity would be hoarded until prospects of a real recovery emerged and that monetary policy was powerless to counteract this. Indeed, while the modelling account of the liquidity trap had put the focus on the choice between money and bonds, Keynes's exposition was set within the wider exploration of issues arising from recession explored in *The General Theory*, whereby liquidity preference effectively applied more widely than the money-bonds choice (see Dow and Dow, 1989). This is explained further in Bibow's (2009) exposition of liquidity preference theory in the modern context.

It was not just that interest rates can only be expected to rise when they are very low. Keynes specifically expressed concern about "the ability of the monetary authority to establish *any given complex of rates of interest for debts of different terms and risks*" (Keynes, 1936, p. 207, emphasis added). In the aftermath of the financial crisis that began in 2008, while official rates of interest have been kept low, monetary authorities have been unable to control risk premia on such assets as the sovereign debt of some euro-area countries and on bank loans to small companies, far less ensure availability. The problem is not just the confident expectations of speculative demand but also the lack of confidence in expectations (and thus in risk assessment) of precautionary demand, which account for the high level of liquidity preference and attitude to different types of debt. The outcome has been pools of liquidity in banks and large non-bank companies, which are not being released to finance capital investment. The Keynesian solution to the liquidity trap therefore is fiscal policy designed to restore confidence in expectations of a recovery. How is this fiscal push to be financed? In noting the possibility of a liquidity trap, Keynes pointed out that "if such a situation were to arise, it would mean that the public authority itself could borrow through the banking system on an unlimited scale at a nominal rate of interest" (Keynes, 1936, p. 207).

SHEILA C. DOW

See also:

Effective lower bound; Financial crisis; Keynes as monetary theorist; Monetarism; Money supply; Policy rates of interest; Zero interest-rate policy.

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Long-term refinancing operations

The Eurosystem's most important open-market operations are its variable-rate main refinancing operations (MROs) with durations of one week and a pre-determined allotment amount. Until mid 2007, MROs satisfied around 75 per cent of commercial banks' demand for central bank money in the European Monetary Union. After the bankruptcy of Bear Stearns in March 2008, however, the European Central Bank (ECB) notably increased the duration of its longer-term credit beyond the standard three-month long-term refinancing operations (LTROs).

Initially, refinancing operations were conducted without changing the overall monetary policy stance, and thus excess liquidity in the euro area was contained. But on 8 October 2008 the ECB announced that it was to conduct both its MROs and LTROs as fixed-rate tenders with full allotment. Simultaneously, the ECB started to gradually widen the collateral framework of its refinancing operations. Since then, the ECB supplies as much liquidity as banks request, if the latter can provide enough collateral of sufficient quality. As a consequence, the Euro OverNight Index Average (EONIA) fell to historically low levels.

Finally, on 8 December 2011, the ECB announced the offer of two three-year LTROs, again as fixed-rate tenders with full allotment (European Central Bank, 2011). The interest rate was set *ex-post* to be the average rate of the MROs over the life of the respective operation. The euro-area banking sector could obtain thereby almost unlimited three-year credit at the price of overnight funds. Since uncertainty in financial markets was very high, euro-area banks made heavy use of this opportunity. On 21 December 2011, 523 European banks took up 489 billion euros. These numbers were outweighed by the second allotment on 29 February 2012, when 800 banks received around 530 billion euros. In total, the ECB supplied the banking sector with around one trillion euros in both its three-year LTROs. As some of the shorter-dated operations were rolled into the three-year LTROs, around 523 billion euros were provided in net terms.

The intention of the non-standard LTROs was to ease liquidity conditions for the euro-area banking sector and to support financial stability. A number of empirical studies confirm the expansionary effects of the non-standard LTROs (see Lenza et al., 2010; Carpenter et al., 2013). Nonetheless, credit demand of non-financial corporations

and households remains subdued – especially owing to the ongoing deleveraging process in the public and private sectors of distressed peripheral countries. The massive recourse to the ECB's deposit facility indicates that banks would rather hoard liquidity than increase their lending to the private sector.

Since January 2013, banks have had the opportunity of early repayment of the three-year LTRO funds. By the time of writing (August 2013), participating banks have redeemed approximately 307 billion euros, or about 60 per cent of the total net liquidity provision (European Central Bank, 2013). As ongoing repayments remain moderate and excess liquidity stays above 200 billion euros, interbank market rates of interest and risk premia have reached their pre-crisis levels.

The ECB's strategy of higher durations and lower collateral standards differed from the extraordinary measures adopted by other central banks. The US Federal Reserve System (Fed) and the Bank of England (BoE) mainly turned to quantitative easing measures instead of extending the maturity of their credit lines. Quantitative easing means a direct purchase of debt obligations, which raises the central bank's credit exposure. In the ECB's repurchase operations, however, the underlying asset remains in the ownership of the private counterparty. If the market value of the collateral declines, the ECB applies time-varying haircuts to shield its balance sheet from credit risk.

One should not confuse these primarily technical dissimilarities with the overall expansionary monetary policy stance across the respective jurisdictions (Lenza et al., 2010). All three central banks considerably increased the size and varied the composition of their balance sheets. The differences in the approaches are related to the different institutional structures of the respective economies. The greater importance of banks (rather than financial markets) as the main source of external funding for the euro area might explain why the ECB focused on the banking channel, whereas the Fed and the BoE instead targeted financial markets.

Besides the positive effects, there are, however, notable risks associated with the non-standard LTROs: a prolonged suppression of nominal long-term interest rates may spark search-for-yield behaviour and increased risk-taking in the financial sector. This can have potentially destabilizing effects on the entire economy (Rajan, 2005). Some economists fear that the unprecedented expansion of monetary aggregates will fuel inflation in the medium run once the euro-area economy recovers. In this regard, two counterarguments can be proposed. First, the conventional view would argue that if the ECB correctly foresees this tipping point and if excess money supply is then rapidly sterilized, inflation may be contained. Second, along post-Keynesian and heterodox lines, there is no necessary connection between money supply and inflation, and, moreover, an excess supply of money cannot exist owing to the endogenous nature of money.

At the moment, the hotter issue is the dependency of the euro-area periphery on central bank funding. The LTROs created an incentive to “borrow low for long”, and to invest in high-yielding peripheral bonds with a maturity of up to three years. The LTROs thus gave rise to a massive carry trade for the euro-area banking sector: a subtle means of monetary financing of government debt (Acharya and Steffen, 2013). In addition, these measures potentially enhanced interconnections between government finances and the health of the banking system even further. If the three-year LTROs, by lowering short-term yields, contributed to the postponement of necessary structural reforms in these countries, the ECB could become a victim of its own policy. As the scope of monetary

policy has been widened, comprising not only price stability but also financial stability, a future conflict of goals is conceivable.

BENJAMIN SCHMIDT AND PETER SPAHN

See also:

Bank of England; Carry trade; Collateral; Endogenous money; Euro-area crisis; European Central Bank; European monetary union; Federal Reserve System; Financial crisis; Financial instability; Monetary aggregates; Money supply; Quantitative easing; Sterilization; TARGET2 system.

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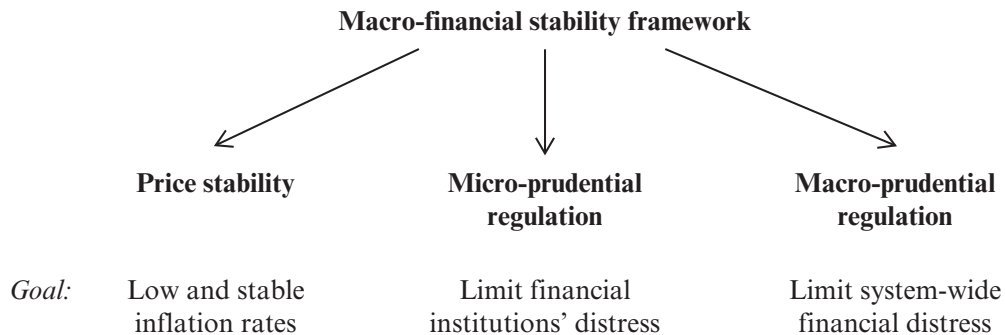
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Macro-prudential policies

While references to the term “macro-prudential” can be found in some unpublished documents of the late 1970s, its use in academic research has become widespread only following the 2008–09 global financial crisis (Clement, 2010, pp. 59–60). The outbreak of that crisis has indeed highlighted the shortcomings of the pre-crisis (New Keynesian) paradigm for policy analysis, which identified the maintenance of a low and stable rate of inflation, combined with a micro-prudential approach to financial regulation focused on ensuring the soundness of individual financial institutions, as necessary and sufficient preconditions in the quest for securing macroeconomic and systemic financial stability. Whence the need to redesign the architecture of the framework for financial regulation – presented in a stylized manner in Figure 7 – by integrating a third pillar designed to mitigate the emergence of system-wide risks to financial stability and their costs in terms of output losses, to wit, macro-prudential regulation.

Unlike the micro-prudential approach, macro-prudential regulation is grounded on a holistic view of financial stability, which treats the whole as something greater than the sum of its constituent parts. As a corollary, macro-prudential regulation views the stability of individual financial institutions and markets as necessary, yet not sufficient conditions for safeguarding the stability of the system as a whole. Behavioural forms that are rational and stability-enhancing at the individual level do not necessarily give rise to higher levels of systemic stability and may actually prove to be fragility-enhancing for the system as a whole. In this respect, by conceiving of risk as an endogenous outcome of the behaviour of individual institutions, the objective of macro-prudential regulation is to identify and neutralize the emergence of systemic risk on its two dimensions, to wit, a time dimension and a cross-sectional dimension.

The former dimension, which relates to the evolution of systemic risk over time, is



Source: Author's elaboration

Figure 7 *A stylized three-pillar structure for financial regulation after the 2008–09 global financial crisis*

associated with the procyclical behaviour of the financial system; that is, its propensity to magnify costly boom-and-bust cycles in asset and credit markets and swings in economic activity. During times of low volatility, rising asset prices and falling credit spreads, the perception of risk declines. Financial institutions are thus encouraged to take on greater leverage and over-extend their balance sheets, contributing to the emergence of financial imbalances that might jeopardize systemic stability as they unravel (Borio et al., 2001, pp. 5–11).

The most important macro-prudential tools under consideration to date (and already implemented in some countries under the Basel III Agreements) to cope with financial system procyclicality range from countercyclical capital buffers to dynamic loan-loss provisions, caps to loan-to-value ratios, and time-varying reserve requirements (see Financial Stability Board et al., 2011, for elaboration on these policy tools).

Deviations of the (private-sector) credit-to-GDP ratio from its long-term backward-looking trend (the credit-to-GDP gap), as well as deviations of asset prices from historical norms are commonly interpreted as leading indicators of emerging financial imbalances. As such, they may be used to calibrate the build-up of countercyclical capital buffers during the upward phase of the business cycle (see Drehmann et al., 2011, for elaboration on this subject matter).

By contrast, the cross-sectional dimension of systemic risk focuses on the distribution of this risk within the financial system at a certain point in time, taking into consideration the common exposures and the financial interlinkages between individual financial institutions. Against this backdrop, a fundamental task of macro-prudential policy is that of identifying those institutions that are deemed to be of systemic importance, either because of their interconnection with the rest of the financial system or by virtue of the risk their failure would pose to the whole financial system and the broader economy, in order to subject them to capital surcharges and internalize their contribution to systemic risk (Acharya et al., 2009, propose a measure of a firm's contribution to systemic risk based on its marginal expected shortfall; alternatively, Adrian and Brunnermeier, 2011, use an alternative CoVaR measure to assess a firm's systemic footprint).

While macro-prudential regulation opens a promising avenue in the quest for financial stability, the risk of being overconfident in its powers is high. First of all, being likely to interact with monetary policy in a powerful and complex way, a better understanding of the links between the latter and macro-prudential policy is needed. Moreover, whether and to what extent macro-prudential policy effectively tames credit growth and leans against asset price fluctuations remains an open issue (see Caruana, 2010). Finally, macro-prudential policies require a considerable degree of willingness by policy authorities to “lean against the wind” of rising asset prices and credit growth during economic booms, possibly preventing their timely implementation. For these reasons, macro-prudential policy remains in uncharted waters.

FABIO S. PANZERA

See also:

Asset price inflation; Basel Agreements; BIS macro-prudential approach; Bubble; Capital requirements; Financial crisis; Financial instability; Lamfalussy, Alexandre; Macro-prudential tools; Reserve requirements; Systemically important financial institutions.

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Macro-prudential tools

Macro-prudential tools are meant to internalize negative externalities stemming from financial system instabilities and inefficiencies. The efficiency of the macro-prudential framework hinges on its capacity to correct for the various forms those externalities can take. They can be condensed into three broad areas: (i) endogenous shock propagation within the financial system; (ii) failure of the financial sector to fulfil an efficient intermediation function; and (iii) tendency of the financial system to transfer risk across sectors, markets and regions to those who are not capable of bearing it.

As regards (i), two mechanisms make the financial system a source of fundamental instability. First of all, the credit or leverage cycle induces a credit boom, which sows the seeds for a bust with severe macroeconomic disruptions (Tymoigne, 2011). The procyclicality of leverage in the financial system is then amplified by risk management and regulatory techniques, insofar as these techniques rely on market price valuation. Examples are internal risk models that form the basis for the calculation of capital requirements: during upswings risk weights will be lower and this will boost credit, while in a downturn higher risk weights will prompt a credit crunch. The leverage cycle is further amplified by the prevalence of collateralized borrowing, where increases in borrowing and in collateral prices fuel each other during booms; when a crisis hits, the feedback loop works in the opposite direction. The second mechanism relates to irrational exuberance bubbles that may be conceptually distinguished from externalities arising from irrational exuberance bubbles such as the bubble in technology stocks in the late 1990s. Here, herding behaviour, fads, and, in particular, myopia play a key role.

Macro-prudential tools that primarily address these sources of endogenous risk propagation aim at reducing procyclical feedback between asset prices and credit, and at containing unsustainable increases in leverage and volatile funding. Related instruments include countercyclical capital buffers (that is, banks are required to hold more capital when there are signs of unusually strong credit growth or when there are signs of a credit-driven asset price boom), caps on loan-to-value ratios for home mortgages, loan-to-deposit ratios and debt-to-income ratios, and measures to contain liquidity and foreign-exchange mismatches (Galati and Moessner, 2013).

Prior to the 2008–09 global financial crisis, banks had built up excessive leverage while maintaining strongly risk-based capital ratios. An overall leverage ratio of capital to unadjusted (rather than risk-weighted) assets may restrict the build-up of leverage in the banking sector and avoid a destabilization of the deleveraging process.

These instruments are designed to have a countercyclical effect on the macroeconomy. At the same time, countercyclical capital buffers are supposed to increase the resilience of the financial system, allowing it to better absorb losses when the boom gives way to bust.

Tax policies may complement these instruments in various ways (Schuberth, 2013). While the most important macro-prudential tools are applied to banks, taxes can be imposed on the whole financial sector, which helps avoid the migration of systemic risk to the less regulated parts of the financial system: financial transaction taxes, for instance, may be well-suited to restrain irrational exuberance bubbles. Systemic risk taxes that are levied on certain balance-sheet positions (including off-balance-sheet positions) can also be used to contain systemic risk. The tax rate can be increased in line with indicators of systemic risk and can be varied in a countercyclical manner across the whole financial sector. Further, bank levies may be specifically imposed on wholesale funding – which proved particularly harmful during the 2008–09 crisis.

Credit booms and asset bubbles can be spurred by cross-border capital flows. Capital controls are used to control systemic risks stemming from volatile capital flows.

Turning to (ii), a second set of negative externalities relates to waste, opaqueness and interconnectedness. The financial sector has performed rather poorly in fulfilling its intermediation function; that is, the transfer of financial resources to the most productive investments. It has created its own circular flows and has extracted rents from the real sector. High rents in the financial sector, which can be the result of lower refinancing costs (caused by letting banks grow too big to fail) or of informational advantages in opaque and complex operations, may indicate excessive risk taking. Financial conglomerates of systemic importance have emerged, creating moral hazard.

Among the financial system externalities that are associated with waste, opaqueness and interconnectedness, regulatory reform initiatives mainly address the externality that arises from financial institutions becoming too large, too interconnected and too complex. One important macro-prudential instrument to internalize the related externality is aimed at correcting perverse incentives by imposing capital surcharges on capital requirements for systemically important banks. Other instruments include, for example, contingent capital, limits on maturity mismatches, and, above all, splitting traditional banking business (“boring banking” – that is, deposit taking and lending to non-financial corporations and households) from other banking activities, which interferes directly with the market structure.

Instruments for limiting waste of resources as well as excessive rent seeking are restrictions on executive compensation or a cap on dividend distributions. Taxes may be complementary instruments. A financial activities tax (on profits plus remuneration) as well as a financial transactions tax may correct for excessive rent seeking and excessive risk taking, and it may result in a downsizing of the financial sector.

Let us consider (iii). Financial intermediaries are supposed to transform risk by having a large number of borrowers, which allows them to absorb default losses because they earn interest on other loans. But financial intermediaries have increasingly developed arcane financial instruments that allow them to transfer risk – in some cases to those who

are not capable of bearing them – instead of transforming it. As a consequence the interconnectedness and correlation of risks in the banking system have increased. Financial stability is also negatively affected by the way in which the securitization process has enabled excessive intermediation through higher leverage of the financial system as a whole.

Macro-prudential instruments for alleviating the inefficient redistribution of risk range from setting up financial market infrastructure and improving market transparency to supporting clearing and settlement arrangements for derivatives and banning or at least restricting particular financial instruments.

Macro-prudential tools contain risks *ex-ante* and help to build buffers to absorb shocks *ex-post*. As they may affect overall output, the economic cycle and inflation, they interact with monetary policy in various ways. Macro-prudential instruments may – besides monetary and fiscal policies – become the third pillar of macroeconomic policy making.

HELENE SCHUBERTH

See also:

Basel Agreements; BIS macro-prudential approach; Bubble; Capital controls; Capital requirements; Collateral; Deleveraging; Financial crisis; Financial instability; Financial transactions tax; Lamfalussy, Alexandre; Narrow banking; Reserve requirements; Systemically important financial institutions.

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Marx, Karl

Interest in Karl Marx’s (1818–83) contributions as a monetary theorist is far from new, but such studies have witnessed a definite revival in recent years. For heterodox economists, an elementary part of the attraction is Marx’s understanding that money is inseparable from any analysis of production and distribution under capitalism. Indeed, it is the circulation of commodities mediated by money that opens up the very possibility of crises (Marx, 1977, p. 209). As a consequence, money can never be understood as neutral in Marx’s system.

While consensus on all aspects of Marx’s monetary theory, and on its applicability to contemporary fiat monetary systems, is absent from the vast literature, the rudiments of Marx’s theory of money are relatively uncontroversial. Though partially articulated in his 1847 critique of Proudhon in *The Poverty of Philosophy* (Marx, 1955), Marx’s theory found its earliest full expression in the *Grundrisse*, written a decade later (Arnon, 1984). As subsequently presented, Marx’s theory was formulated as a critique both of the Currency School and of radical proposals made by Proudhonists who championed labour-time as the proper backing for any paper currency. In Marx’s “mature” view, within capitalist

economies money must play a dual role: serving as both the formal measure of the value of individual commodities to society, and as an abstract standard (*money of account*) in which a schema of relative prices, as well as debts, can be denominated.

Considering first money's role as a measure of value, Marx argues that while money-things antedate capitalism, the rise of a singular monetary standard and the generalization of commodity production are concomitant. For Marx (1977, p. 129), "[w]hat exclusively determines the magnitude of value of any article is [. . .] the labor-time socially necessary for its production". Though all commodities share a common substance in the abstract labour-time expended on their production, and are thus commensurable in principle, a system of commodity production requires a shared social form through which this common constituent can be measured in practice. Moreover, commodities do not obtain their social value merely by the concrete labour-time embodied in them. Rather, socially necessary labour-time is gauged by the prevailing average labour required for the commodity's production, and by the existence of effective demand for it. The concrete labour-time expended on the commodity's production is thus recognized, fully or partially, as socially necessary labour-time only through the act of exchange. The act of exchange further requires that a single commodity should separate itself from the mass of commodities to serve as a "universal equivalent".

Plainly, the historically specific money-form confronted by Marx was gold, and gold-backed paper currency. Whether the existence and use of commodity, or commodity-backed money, is essential to Marx's theory of value has been the subject of considerable debate in the literature. Defenders of the centrality of commodity-money have, for instance, drawn attention to Marx's repeated critiques of the doctrine of the "nominal standard of money" (Nelson, 2005). Here Marx (1970, p. 76) chastized authors such as James Steuart and Bishop Berkley, who claimed that money "denote[d] ideal particles of value but not weights of gold [. . .] or any other form of materialized labor".

From this perspective, commodity-money is also seen as central to Marx's rejection of the quantity theory. As the value of commodity-money is given by the average labour socially necessary for its production, Marx contends that prices, and the velocity of circulation of money, determine the quantity of money that enters into circulation. By contrast, others (see Williams, 2000) emphasize that commodity-money is largely a simplification adopted by Marx in the early chapters of his *Capital*; chapters in which the discussion is conducted at a high level of abstraction. This simplification is then largely abandoned in Marx's subsequent concrete discussion of circulation in developed capitalist economies. Various reconciliations of Marx's value theory with non-commodity-money have also been proposed, though these are generally presented as amendments to Marx's theory, rather than as elements of his extant writing (see Foley, 1983; Moseley, 2005).

Insofar as money serves as a unit of account, Marx (1970, p. 70) is clear that gold, or any other commodity backing, is needed "only in the imagination". Further, he emphasizes that as the adoption of a given unit of account is "purely conventional", widespread acceptance is prompted by the actions of the state (*ibid.*, p. 72). Within the third volume of his *Capital* (1967), Marx also discusses at length how the development of the credit system is required for the acceleration and expansion of commodity circulation. As highlighted by Hein (2006), Marx's presentation of commercial banking makes clear that the

creation of credit-money is unconstrained by savings deposits, and is then endogenous to the needs of the system.

In denying the theoretical possibility of a natural rate of interest, Marx understands the rate of interest on capital advanced as a claim by finance to profit created in the sphere of production. The average rate of interest is therefore bounded, at its extreme, by the uniform rate of profit. The uniform rate of profit, acting as a centre of gravity for the system, is determined by the distributional conflict between capital and labour. The rate of profit that obtains within any specific sector at a given moment, however, is inversely related to the specific rate of interest charged by finance. Hence, Marx (1967, p. 365) can conclude that while each individual loan implies a conflict between different sectors of capitalists, “the general rate of profit appears as an empirical, given reality in the average rate of interest, although the latter is not a pure or reliable expression of the former”. Though not without limitations, Marx’s monetary theory was a clear advance over Classical conceptions, and an anticipation of many recurrent post-Keynesian themes.

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See also:

Banking and Currency Schools; Commodity money; Endogenous money; Fiat money; Finance and economic growth; Monetary circuit; Money and credit; Money neutrality; Quantity theory of money.

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Merchant banks

Merchant banks first appeared in the Italian trading cities during the Renaissance as institutions dedicated to provide credit to commercial activity. Over time, merchant banking became increasingly specialized, and today it is not a type of institution, but mainly the activity of financing private equity performed by many different institutions. At the beginning, the typical business organization included family enterprises or small partnerships, and the paintings of Marinus van Roejmerswaelen (“The Money Changer and His Wife”, 1539) and of Quentin Massys (“The Money Lender and His Wife”, 1514) immortalized the former.

The strong connection between money and trade at the origin of merchant banking suggests that bank money arose from trade, not from receipts and notes issued by goldsmiths in exchange for gold deposits (Kindleberger, 1993). However, merchant banking was not the only source of credit, and during the Renaissance the credit system had a tripartite structure (Lopez, 1979). There were pawnbrokers making loans to the less wealthy borrowers, money changers and deposit bankers changing foreign currency without credit, and merchant bankers providing credit to commercial and industrial entrepreneurs and governors.

The initial funding of merchant banks came from small merchant houses' excess capital (Craig, 2001). They issued and traded diverse credit instruments such as cash and commodity advances, transfer orders, time deposits, letters of credit and bills of exchange negotiated in organized money markets. These instruments evolved from more specific transactions such as sea loans (commodity import and export funds advanced in exchange for a share of profits) and *cambium maritimum* (exchange of foreign currency by means of lending in one currency and receiving in another) (De Roover, 1965).

In this earlier form, merchant banking illustrates the principle of money-supply endogeneity and gives support to the revolutionary perspective proposed by Rochon and Rossi (2013). As such, despite the fact that there was no central authority to establish money-supply controls in the Italian cities (the Italian central bank was created in 1893), bankers carrying out merchant activities, specifically foreign trade, knew the "state of trade" to provide credit according to demand. Lopez (1979) reports the supply of "soft credit" or overdraft facilities and dry exchange contracts, an innovation used to evade church restrictions on interest payments, when hard commercial credit (bank loans) could not satisfy the demand during periods of boom.

Banking activity in the modern era migrated from Italian cities to Amsterdam and then to London. The industry evolved by means of increasing specialization, dealing with commodities from general trade to specific trade, then using bills of exchange to facilitate long-distance trade and finally broking bills of exchange. This final transition took place in Holland during the eighteenth century (Kindleberger, 1993). Bankers abandoned merchant banking to take less risk, sometimes in exchange for seeking higher status in the nobility, a movement from entrepreneurs to *rentiers*. Chapman (1984) provides a fuller discussion of British merchant banks during the nineteenth century.

Today merchant banking is a specialized activity more than an institution or organization. Large bank holding companies, commercial and investment banks, along with boutique banks, all engage in merchant banking. Activities include mainly negotiating highly specialized investment in private equity in unregistered securities of public or private companies, start-ups and financing private investment in public equity of large companies. Other activities comprise raising capital, syndicating loans, consulting, advising on mergers and acquisitions, funding international trade, speculating and providing bridge loans (Craig, 2001). Investments mostly take the form of venture capital or leveraged buyout and mezzanine finance. The most common instruments traded are common stocks and other convertible securities. It is clear that the movement away from credit and into debt restricts the ability of central banks to exert any direct influence on their activities.

By the end of the 1990s, the private equity market in the United States represented only a small fraction of the commercial and industrial bank-loan market and an even smaller

fraction of the public equity market. On the other hand, it is similar in size to the initial public offering market and the market for junk bonds (Craig, 2001). Merchant banking has been far more important in Great Britain, but globalization has contributed to the decline of the industry (Banks, 1999). Machiraju (2010) provides a detailed view of specific operations of merchant banks, and adds a perspective from a developing economy.

Finally, merchant banking is considered risky and highly profitable (Craig, 2001). The source of increased risk derives from lack of regulation, non-existence of collateral in investing and the international scope of operations. As financial history suggests, this is a potential source of financial fragility and instability, given the relatively high levels of investment in merchant banking by large banks and bank holding companies and the lifting of restrictions in the United States by the Gramm–Leach–Bliley Act of 1999. Addressing this problem requires transforming the behaviour of central banks, focused exaggeratedly on the control of rates of inflation, and bringing it into paying more attention to the regulation of such activities in order to achieve greater financial stability (Tymoigne, 2009).

MARCELO MILAN

See also:

Bank money; Barings Bank; Endogenous money; Financial crisis; Financial instability; Investment banking; Money and credit; Money supply.

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Metallism

Metallism is the intellectual tradition that serves as the basis for orthodox monetary theory, which expounds that the dominant economic system is a barter economy (Menger, 1892, p. 242). This ultimately leads to the contentious result that money is a creature of the market. As a matter of fact, metallism posits that money was indeed invented to reduce the transaction costs that are associated with the process of determining a market clearing relative price vector. Thus, money is thought to be an efficient innovation that was produced by market mechanisms (*ibid.*).

Accordingly, in order for exchange to occur, there is inherently a requirement for an interaction between two individuals, each possessing an item that the other desires, which

is labelled as the double coincidence of wants (Menger, 1892, p.242; Wray, 1998, p.39). Should these two individuals experience the double coincidence of wants, there is now a problem confronting them stemming from the need to calculate the relative exchange value of the items exchanged and the indivisibility of physical output (Menger, 1892, pp.242–3, 246; Wray, 2010, p.31).

Suppose two individuals decide to exchange a cow and bushels of wheat. After calculating the relative exchange values of both items, assume that they ascertain that this ratio is one cow for two bushels of wheat. Accordingly, there is a divisibility problem if the individual initially possessing wheat has an odd number of bushels, because a cow cannot be subdivided and live. Hence, the exchange will either not occur or will be delayed until the individual with wheat can access an even number of bushels. The result of this process is that individuals would either have to carry all of their potentially tradeable possessions or be forced to delay their transactions until a later time. In both cases, this obviously raises transaction costs. Furthermore, to the extent that traders are compelled to carry all of their tradeable possessions with them, it would force them and those with whom they experience a double coincidence of wants to calculate the relative exchange values of goods. This would, however, raise transaction costs further (Menger, 1892, p.242; Wray, 2010, p.31). Consequently, this barter economic system would be incredibly inefficient.

Because of the high level of transaction costs associated with this inefficient system of barter, it is purported that money came into existence to serve as a medium of exchange (Menger, 1892, pp.239–40; Wray, 2010, p.31). In other words, in order to eliminate and/or to reduce these transaction costs, the community of traders will eventually come to consensus on an item, through market exchange, that can be utilized as the system's method of measuring and reflecting relative exchange values (Menger, 1892, pp.247–9; Wray, 2010, p.31). Because all the various items' relative values will now be measured in terms of their exchange value to this one item, the previously heightened transaction costs will now disappear (Wray, 2010, p.31). At this point, the only requirement for an exchange to occur is that one individual possesses a sufficient amount of this medium of exchange to pay the price of the item s/he wishes to obtain in exchange. Thus, we find that the nature of money is to lubricate exchange and facilitate the reduction of transactions costs (Wray, 2010, p.30). Furthermore, it is claimed that money's historical origin is found in private market transactions of a barter economy (Menger, 1892; Wray, 1998, 2010).

Naturally, this leads to the inquiry as to what characteristics are necessary for an item to be elevated to the role of money. A first requirement is that it must be considered inherently valuable by a trader, because otherwise that individual would not accept it in exchange for his/her own item (Menger, 1892, pp.247–9). Second, it must also be deemed valuable by the community, because even if an individual trader subjectively feels an item is valuable and can serve as a medium of exchange, s/he may not trade his/her own item in exchange for another item if s/he believes that others are unlikely to accept the latter item (Menger, 1892, pp.247–9). Consequently, in order for an item to serve as a medium of exchange, that item must be considered valuable because "others find it valuable". The culmination of this exercise is the proposition advanced by metallists that the item chosen to serve as the medium of exchange will typically be gold or other precious metals because of what is said to be their intrinsic value; that is, it is argued that these items have been inherently valued since the beginning of time owing to their natural quality of con-

taining wealth (Menger, 1892, pp.249–50; Wray, 2010, p.31). Because of this proposition concerning precious metals and its connection to money's purported inception, the name given to this monetary tradition was metallism.

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See also:

Bank money; Chartalism; Commodity money; Fiat money.

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Minsky, Hyman Philip

Hyman Philip Minsky (Chicago, IL, 23 September 1919 – Rhinebeck, NY, 24 October 1996) was a North American economist of Russian descent. Minsky studied at the University of Chicago (Bachelor in mathematics, 1941) and then at Harvard University (Master in public administration, 1947, and PhD in economics, 1954), where he served as a teaching assistant to Alvin Hansen. From 1957 to 1965 he was an associate professor of economics at the University of California, Berkeley, and then he worked as a professor of economics at Washington University in St Louis. After his retirement, in 1990, Minsky was a distinguished scholar at the Levy Economics Institute of Bard College in New York.

In spite of his theoretical originality, which makes it hard to strictly catalogue his contributions, Minsky is regarded by some as a leading figure in post-Keynesian economics. However, Minsky preferred to label his approach as "financial Keynesianism". Besides, he made no secret of the fact that he had been deeply influenced also by other authors of different theoretical origins, notably Oscar Lange, Henry C. Simons and other Institutionalists. Minsky's interest in the endogenous forces driving the business cycle clearly denotes a Schumpeterian hint as well. Indeed, Joseph Schumpeter should have been Minsky's doctoral supervisor at Harvard, but Schumpeter's untimely death forced Minsky to change his plans and finish his thesis under Vassily Leontief. For sure, Minsky rejected the way in which the vast majority of neoclassical-synthesis' economists interpreted Keynes's theory.

More precisely, Minsky advocated the replacing of the still-dominant "village fair paradigm" (that is, the neoclassical general equilibrium model) with a "Wall Street paradigm". Under the former, money is just a "lubricant" that does nothing other than facilitate exchanges of goods between identical, sovereign, completely rational individual agents with perfect foresight. Under the latter, money is the necessary prerequisite for investment and production, thereby making the sustainability of the system dependent upon the uncertain regeneration of cash flows between borrowers (especially investing firms) and lenders (notably banks and other financial intermediaries). Indeed, while the former gives a snapshot of an imaginary self-producers' economy of exchange, the latter describes the dynamics over time of a real-world financially sophisticated monetary economy of production.

In spite of this innovative methodological take, the theoretical nature of Minsky's most known theoretical contribution, the co-called "financial instability hypothesis" (FIH), is rather controversial. More precisely, it has been argued that the origin of the FIH is rooted in "loanable funds theory" (Lavoie, 1996; Rochon, 1999). In this sense, it would be affected by the same weakness Minsky attributed to Keynes's work, namely the presence of some hidden "contaminations" with premises of neoclassical economics. However, Minsky's conclusions are certainly far from neoclassical results. The key insight underpinning the FIH is that "stability is destabilizing". "Tranquil growth" and "hedge" positions open the way to "speculative" and "ultra-speculative" (or "Ponzi") forms of behaviour, owing to the profit-seeking nature of economic units (be they firms or banks). Such forms of behaviour, in turn, lead to the reduction of "safety margins" of units, thereby affecting the financial soundness of their balance sheets. The point is that, as prosperity proceeds, units are prone to take on more and more risk, until their leverage ratios (or the mismatch between assets and liabilities terms) achieve a critical threshold. When expected cash inflows generated by capital assets of firms are no longer sufficient to cover cash outflows generated by corresponding liabilities, or a (however small) negative shock hits the economy, it comes to the turning point of the cycle.

Over-leveraged units are forced to sell their positions to reduce their indebtedness. However, this increases the gap between demand and supply of cash, leading to a sharp drop in market liquidity – an event that has been labelled as a "Minsky moment". Consequently, aggregate investment collapses and so do output and employment levels. In principle, a long road to recovery via market adjustments cannot be excluded, but "it may well go by way of hell" (Minsky, 1986, p. 177). A "big government" (namely, a broad socialization of investment aiming to achieve full employment) supported by a "big bank" (namely a central bank acting as a lender of last resort) are, therefore, necessary in order to impose institutional "ceilings" and "floors" that constrain the endogenous instability of the economic system.

Notice that, from a theoretical perspective, the FIH is an attempt to combine Keynes's investment theory of the business cycle with a financial theory of investment. The two microeconomic pillars of the FIH are the "two-price model" and the "theory of increasing risk" (both from Keynes and Kalecki). Indeed, it is necessary to shift the focus from the interest rate to the demand price of capital assets as the key variable for investment undertaken by the individual firm. The higher is this price compared to the supply price of new capital goods, and the lower are borrower's and lender's risks, then the higher will be the individual investment. If quasi-rents (that is, expected income cash flows net of current costs, roughly corresponding to expected money profits) drive individual investment plans, aggregate profit reflects, in turn, aggregate investment. "Kalecki's profit identity" would, therefore, provide the equation that logically closes Minsky's system. However, the very possibility of integrating FIH's micro-foundations in a Kaleckian macroeconomic frame remains an open question. The point is that the overall leverage ratio does not reflect the individual leverage ratio of a "representative" investing firm. The former is determined by firms' decisions as a whole about investment and profit retention. Thus, there is a possible missing link between micro and macro levels in Minsky's theory (see Lavoie, 1986; Lavoie and Seccareccia, 2001; Bellofiore and Halevi, 2009).

Since its beginning, Minsky's influence has been spreading well beyond the strictly

defined post-Keynesian borders. Minsky's insights are still at the basis of a number of heterodox monetary approaches (including the so-called "Modern Money Theory") and formal models (including Minsky–Goodwin models, stock–flow consistent models, and some agent-based models). The outbreak of the US subprime mortgage crisis in 2007 and the bankruptcy of Lehman Brothers in 2008 brought great popularity to Minsky, especially among journalists, financial analysts, central bankers and other practitioners.

Notice, however, that some economists argued that the US subprime crisis was not a "Minsky moment" (see Davidson, 2008). The point is that financial instability resulting from the subprime mortgage market collapse did not meet the criteria set down by Minsky (as regards the movement of investing firms' balance sheets from hedge to speculative to Ponzi positions). On the other hand, Minsky's approach to the balance of payments, which emphasizes how balance-of-payments' cash flows are necessary to validate the payment commitments on international indebtedness, is usually considered as a fundamental tool in the analysis of the so-called "European sovereign debt crisis" that began in late 2000s.

Minsky's FIH also inspired a somewhat "dissenting" branch of mainstream economics, rejecting the standard "efficient market hypothesis" and culminating in the "financial accelerator mechanism" model pioneered by the former Chair of the US Federal Reserve (Fed), Ben Bernanke, and other New Keynesian scholars. The current Fed Chair, Janet Yellen, has been referring to Minsky's FIH in her speeches as well. In addition, some new dynamic stochastic general equilibrium models have been provided in which "Minsky moment" shocks are accounted for. However, the possibility of cross-breeding Minsky's thought with current theories and models (be they mainstream or not) is still being discussed.

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See also:

Efficient markets theory; Euro-area crisis; Financial crisis; Financial instability; Financial instability hypothesis; Minsky moment; Modern Money Theory.

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Minsky moment

The expression "Minsky moment" was coined in the late 1990s in reference to the Asian financial crisis and was again used to describe the driving forces behind the global financial crisis of 2008–09. Hyman Minsky's financial instability hypothesis, however, has little to do with moments (Wray, 2011). Instead, it describes the sustained, cumulative processes in which periods of stability induce an endogenous increase in potential financial fragility, which leads to a process of debt deflation and a full-blown Minsky crisis. Financial crises are not traceable to lack of regulation, expansionary monetary policy or ethical misbehaviour, but are a systemic feature of what Minsky called "money manager capitalism" – a stage in the evolution of capitalism that emerged in the second half of the twentieth century. This stage is characterized by highly-leveraged funds seeking maximum total returns in an environment that systematically underprices risk. "Money manager capitalism" has successively reversed most of the regulations that were implemented after the Great Depression.

Minsky provided a theory of financial business cycles that has to be considered as a multi-faceted endogenous process: an initially robust financial structure will lead to conditions conducive to crisis, where the triggering moments of the disruption themselves may be entirely endogenous to the process.

To understand the transition from robustness to fragility, Minsky's distinction between three types of financing units (banks and firms) is key: hedge, speculative, and Ponzi finance (Minsky, 1986). Each financing unit has a cash payment commitment on debt as well as expected cash flows owing to rents on capital assets or the sale of financial assets. Hedge financing units can make debt payments covering interest and principal, using cash flows resulting from investment. Hedge financing is associated with a greater weight of equity financing in the liability structure. In the case of speculative units, expected cash flows cover interest payments, but such units must roll over maturing debt. As Ponzi units cannot make sufficient payments on interest and principal with the cash flow from investments, debt is continuously on the rise. All units are vulnerable to unexpected decreases in receipts in the wake of interest-rate increases, income shortfalls, or unprecedented events that are typically random and unexpected.

An interest-rate hike – a central bank's response to rising asset prices – for example will cause investment to go down and defaults to go up. Financial intermediaries will start selling financial assets to meet their contractual commitments. Given a reduction in cash flows, the pyramid of credit made up of layers of contractual commitments is likely to collapse. Even speculative units will not be able to meet interest payments without

refinancing their debt. Falling asset prices, pessimistic revisions of expectations, and credit rationing will deepen the downturn.

During a recession, traditional equilibrating neoclassical mechanisms such as the Pigou effect, which states that a drop in the price level will revive aggregate demand, are supposed to fail. In a deflationary situation, creditor behaviour reinforces the reduction in expenditure, as the value of collateral declines when prices fall and debtors cannot meet their repayments.

The greater the proportion of units that can be classified as speculative or Ponzi, the greater the fragility of the system is. This proportion increases endogenously during an upturn that is associated with rising debt-to-equity ratios. Thus, an upturn already sows the seeds of the next downturn, as a high level of consumer demand, rising investment and optimistic expectations – which manifest themselves in increasingly optimistic valuations of assets combined with an increased willingness to take on more risk – create the conditions for the transformation of hedge units into speculative units, and speculative units into Ponzi units.

Since the 1980s, financial instability has risen on the back of the transformation of the global financial system: ever more arcane financial innovations have cropped up, the increasing complexity of financial networks has exacerbated the financial system's fragile characteristics and amplified uncertainty, and the emergence of a shadow banking system fuelling credit has extended to the private sector. In other words, the Great Moderation was accompanied by the Great Leverage, where the role of indebtedness and cash payment commitments of firms (including banks) as well as the revaluation of assets play a crucial role.

The global financial crisis is often alleged to provide an out-of-sample test of Minsky's "financial instability hypothesis", which he had developed in the decades between 1960 and 1990. While the crisis exhibited many of the ingredients of Minsky's hypothesis of a financially driven boom – Minsky's three borrowing stages were evident as the "Great Leverage" has built up – interpreting it as a purely financial phenomenon driven by proclivity to speculation and excessive optimism on the part of borrowers and lenders is probably too narrow an approach. Efforts to incorporate the financial instability hypothesis into a broader theoretical setting are made by representatives of different theoretical approaches, such as New Marxists and Structural Keynesians (for an overview see Palley, 2009). They trace the ultimate roots of the crisis back to developments within the real economy. Wage squeeze and deterioration of income distribution give rise to a Keynesian aggregate demand problem. To counter stagnationist tendencies, expansion of finance played a critical role in supporting demand growth. This was evident by an increase in household indebtedness, in particular mortgage loans in the run-up to the global financial crisis. Minsky's analysis, however, focuses on a microeconomic perspective regarding firms' leverage that rises with the pick-up in investment during the boom. Lavoie and Seccareccia (2001) have pointed towards an aggregation problem in Minsky's analysis when applying his microeconomic analysis of investment at the macroeconomic level. Even if investments are debt financed, the overall level of indebtedness of the non-financial corporate sector may remain unchanged, since the debt of investing firms may be balanced by firms' profits. But even if there may be a lack of rigour in the passage from microeconomic to macroeconomic analysis, this does not undermine the relevance and logical consistency of the financial market instability hypothesis.

HELENE SCHUBERTH

See also:

Asset price inflation; Collateral; Debt deflation; Financial crisis; Financial instability; Financial instability hypothesis; Minsky, Hyman Philip.

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Modern Money Theory

Modern Money Theory (MMT) is a macroeconomic approach, centred on the analysis of the monetary system, which finds its root in chartalism and was developed within the post-Keynesian school of thought. However, it has had discontents among post-Keynesian scholars, both on the logical/theoretical framework (see Rossi, 1999; Gnos and Rochon, 2003; Rochon and Vernengo, 2003) and on the policy recommendation part (see Sawyer, 2003; Seccareccia, 2004).

MMT has three important components. First, the defining characteristic of money is its ability to be accepted by the State in the payment of taxes. The concept is wider and encompasses that of fiat money since a chartal means of payment can be anything a government decides. This implies that, in the case of a State issuing its own currency, public spending has to occur in order to supply the needed chartal means of payment. As such, public spending precedes taxation. Further, chartalism does not refer exclusively to contemporary, or modern, economic systems. Hence, the title Wray (1998) chose for his book, *Understanding Modern Money*, had an ironic tone in using the word “modern”. He was referring to a sentence by Keynes (1930 [1971], p. 3), who stated that monetary systems had been chartal “for some four thousand years at least”.

The second component of MMT is the three financial balances (see Godley and Cripps, 1983). This macroeconomic accounting framework partitions the economy into three institutional sectors: private, public, and foreign. The standard national accounting ($Y = C + I + G + X - M$) is manipulated to obtain an identity (*domestic private balance* + *domestic public balance* + *foreign balance* = 0), a constant reference throughout the MMT analysis. However, the attention to accounting is not confined only to this identity, as the perspective is twofold and takes into account both stocks and flows. Therefore, the impact of different economic policies is analysed keeping in mind that each asset implies a liability, and each deficit implies a surplus within the economic system.

The core of the policy indication of MMT derives from Abba Lerner’s “functional finance” – a term coined in opposition to “sound finance”.

Functional Finance is not a policy. It is only a framework within which all sorts of different policies may be applied. It merely indicates how the government, in addition to doing whatever it may want to do on all other matters can also [. . .] give us full employment. (Lerner, 1951, p. 135)

According to functional finance, the government has two goals: full employment via a reasonable level of aggregate demand, and an interest rate that optimizes investment. Further, it should use all existing instruments to attain these goals.

The principle of maintaining full employment and the chosen rate of investment completely determines the amount of borrowing or lending undertaken by the government, so that any other principle about the relation between tax revenues and expenditures, such as the budget-balancing principle, must either coincide with the policy already determined, in which case it is unnecessary, or be in conflict with it, in which case it must be rejected. (Lerner, 1944, pp. 318–19)

MMT embraces Lerner's functional finance and enlarges it, adding currency and trade balance considerations accordingly to the three balances approach. The acme of the policy implication of the MMT–functional finance is Minsky's employer of last resort (Minsky, 1986), which is the third component of MMT. The scheme would have the government offer a job to anyone willing and able to work. According to its proponents, the programme would not only have a positive social outcome, eliminating unemployment, but also increase economic stability, as the scheme would give a “price floor” for wages – one of the main components of the price level.

One of the main conclusions of the MMT approach is that if a State is sovereign, it can regulate its own markets so that they are at their full potential output. The concept of sovereignty encapsulates two notions: those of fiscal and of monetary sovereignty. Because of monetary sovereignty – the State is a currency issuer rather than a currency user – the State can afford to buy everything that is for sale in its own currency and thus makes sure that aggregate demand is such that output is at its full potential level. The fiscal side of sovereignty ensures that the State can enforce taxation in order to create the need for the sovereign currency and to remove excess demand in the case of a booming economy. In that framework, public expenditure logically comes before taxation or debt emission. Further, the quantity of money left in the economy is a mere result of the different policy goals.

In conclusion, MMT has two sides: a descriptive and a prescriptive side. The descriptive side derives from the combination of chartalism and New Cambridge's three balances approach, and leads to an internally consistent framework from which the prescriptive side of the theory – an evolution of Lerner's functional finance – is deduced.

EUGENIO CAVERZASI AND ANTOINE GODIN

See also:

Bank money; Central bank as fiscal agent of the Treasury; Chartalism; Fiat money; Flow of funds; Minsky, Hyman Philip; State money.

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Modigliani–Miller theorem

The Modigliani–Miller theorem deals with the question of what is the optimal capital structure, or debt-to-equity ratio, for a corporation. The “traditional” theory of the cost of capital held that the cost of capital should fall and then rise in a U-shaped pattern as debt-leverage rises. Borrowing to increase capital investment, for instance, increases the potential return on equity but also increases the riskiness of this return, owing to the obligation to make debt payments even when profits fall. Since the risk, as measured by the variance of return on equity, increases proportionally to the square of the ratio of debt to equity, small amounts of debt can be desirable to risk-averse investors but large amounts are not.

Modigliani and Miller (1958) made the argument that, in the absence of transactions costs and taxes, the cost of capital should not be affected by debt-leverage. Identical earnings across firms with different degrees of debt-leverage should be valued at the same price. If arbitrage costs are negligible, a shareholder can “undo” the degree of leverage in his or her position in the assets of a firm by trading between stocks and bonds of the corporation. Modigliani and Miller (1958) did not deny then that using debt entails risk. Rather, they were arguing that it is the risk position of the shareholder, not that of the firm, which matters.

Miller and Modigliani (1961) gave a similar argument that it should make no difference to shareholders whether a firm retains earnings to finance its growth or pays out its earnings and borrows to obtain finance. In the absence of taxes and transactions costs, the shareholders obtain equal value if they receive dividend payouts and new owners or creditors have claims on the firm, or if they do not get dividend payouts but see their shares appreciate. If an individual shareholder wants a different arrangement, he or she can reinvest some of their dividends or sell some of their shares.

In the “real world”, of course, there are taxes and transactions costs, but objections have been raised to the Modigliani–Miller theorem in its pure form. Modigliani and Miller (1958) themselves allowed for “rolling your own” leverage to increase risk under the possibility of “fear of ruin”, should a firm be close to bankruptcy. If we take account of tax advantages due to the deductibility of interest on debt and of bankruptcy costs, we have a new argument for an optimal capital structure.

More recent critiques have rested mainly on considerations of asymmetric information or agency costs. Stiglitz and Weiss (1981) demonstrated that if lenders are less well informed than borrowers about the prospects of a project to be financed, allowing interest rates to clear the market for loans might encourage adverse selection. This means that, as higher interest costs require higher potential payoffs, credit will go to riskier ventures.

This implies that lenders should charge below-market-clearing interest rates and ration the access to credit.

Similarly, Greenwald et al. (1984) argued for equity rationing owing to incentive effects and signalling effects under asymmetric information. Limits on the ability to raise equity finance come from the fact that debt gives managers stronger incentives to perform owing to the costs of bankruptcy, the fixed commitment of the debt payments, and the greater ability to withdraw debt financing. Since debt then is preferred to equity finance, firms that attempt to sell new equity send a signal that they may not be able to bear greater debt and so represent riskier investments.

Myers (1984) called the arguments for a hierarchy of sources of finance the “pecking order” theory of the cost of capital. There seems to be significant evidence that firms show a preference for retained earnings over issuing debt and then for debt over issuing new equity in their financing choices. The research work within the neoclassical paradigm that supports this relies on asymmetric information and agency costs. Kalecki’s (1937 [1990]) principle of increasing risk, which comes to the same conclusions regarding financing choices, rests rather on limitations on the access to capital.

In the 1954 version of Kalecki’s (1954 [1991], p. 279) writings on this subject, he wrote that “a joint-stock company is not a ‘brotherhood of shareholders’ but is managed by a controlling group of big shareholders, while the rest of the shareholders do not differ from holders of bonds with a flexible rate of interest.” To Kalecki, then, the impairment of the wealth position of the “big shareholders” is the risk to which they are exposed with new debt or equity issue. Yet we should also realize that what matters the most for the economic outcomes with which we are concerned is the risk to the firm’s ability to compete successfully and to survive as an entity that produces output with labour and capital inputs. Any firm’s shareholders should thus care about the firm’s capital structure, but whether or not they do, capital structure matters to the behaviour of firms and their effects on the economy.

TRACY MOTT

See also:

Asymmetric information; Flow of funds.

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Monetarism

Monetarism is a school of thought advocating the so-called quantity theory of money, the origin of which goes back to the work of Hume (1826 [1955]). According to the Scottish philosopher, money and output are two separate magnitudes and their ratio defines the level of prices. “It seems a maxim almost self-evident, that the prices of everything depend on the proportion between commodities and money” (ibid., p. 41). It was Fisher (1911) who provided the traditional version of the quantity theory of money in the form of the equation of exchange: $MV = PT$, where M is the quantity of money, V the velocity of circulation of money, P the level of prices, and T the number of transactions per unit of time. The idea behind Fisher’s equation is that the product of the units of money available in a given economic system (M) and of the number of times each unit is used in a given period (V) is necessarily equal to the product of the number of payments carried out in this same period (T) and the level of prices (P). Later taken over by Friedman (1956), the equation of exchange was restated in the form of the Cambridge equation: $M = kPy$, where k is the ratio of money stock to income and y stands for national income at constant prices.

According to monetarism, whether in Fisher’s or Friedman’s version, the quantity equation has the logical status of a causal relationship. As such, it becomes a useful instrument to explain nominal price variations and to suggest the monetary policy best suited to maintain or re-establish equilibrium between nominal and real variables. To reinforce this claim, Friedman (1956) replaces the assumption of the constancy of V with that of the stability of the demand function for money, and thus transforms the quantity theory into a theory of the demand for money. In the models advocated by monetarism, the demand for money is generally considered to be stable, and money supply is identified as the factor whose variation has to be controlled via monetary policy.

Critical analysis reveals, however, that no causal relationship can be established between the stock of money and the price level, since the two terms of the quantity equation are simply two expressions of one and the same reality (Cencini, 1988). The amount spent on any given number of transactions may be expressed either by MV or PT , and no numerical difference is possible or even conceivable between them. Hence, Fisher’s equation is nothing more than a truism, an *a-priori* truth whose cognitive or epistemic value is unavoidably nil. “The equation of exchange must hold, of necessity, because Mv and pT are two ways of measuring the same thing, the aggregate value of all transactions taking place over some given period” (Jackman et al., 1981, p. 10). The Cambridge equation is derived from Fisher’s through a simple mathematical transformation and it shares the same status of a useless tautology. A mere mathematical manipulation cannot transform a truism into a positive theory.

Friedman’s (1956) restatement of the quantity theory of money also fails to establish a causal relationship between money and prices. The variables of his demand-for-money equation are co-determined, and if prices and demand for money are but the twin results of a unique solution, neither can be considered as the cause of the other.

The important message of monetarism is epitomized in Friedman’s famous claim that “money does matter” (Friedman, 1956, p. 129). As a neoclassical economist, Friedman (ibid.) shares the widespread belief in relative prices and in general equilibrium analysis (GEA). His assertion has therefore to be interpreted within this theoretical framework.

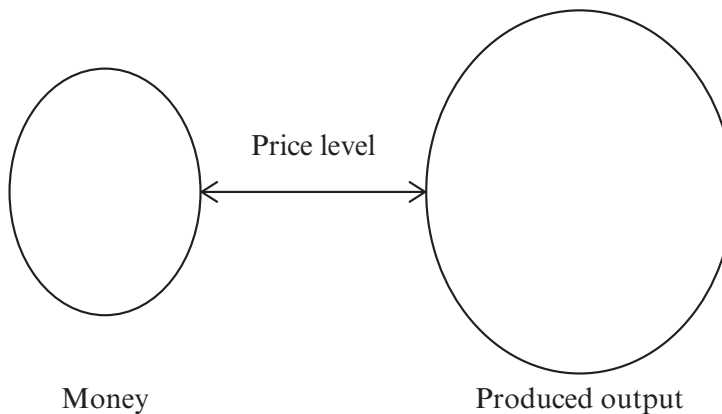


Figure 8 The equilibrium between the quantity of money and produced output

Even though monetarists accept the primacy of real variables, they admit that money is far from being neutral. Consistently with the main tenets of GEA, they consider money and output as two dichotomous magnitudes, as two distinct quantities or “stocks” whose equilibrium is subject to potentially disruptive variations whenever the supply of money, an exogenous variable, changes more than expected. Money, issued by monetary authorities, is presumed to have a positive value of its own, and the equilibrium between its quantity and that of produced output (autonomously determined by firms) is attained through a variation of the price level (Figure 8).

The explicit use by monetarists of terms such as “quantity”, “stock” and “velocity” is symptomatic of the fact that money is conceived as an asset or even as a commodity endowed with a positive value of its own. This vision, greatly influenced by Newton’s classical mechanics, culminates in the search for equilibrium between opposite forces: supply and demand. The question that must be asked is therefore clear: is it still correct to consider money as a stock in a world where money is unanimously recognized to be bank money? Quantum macroeconomics provides a straightforward answer: being issued by banks through double-entry bookkeeping and as their spontaneous acknowledgment of debt, money has no intrinsic value whatsoever and cannot be identified with a stock (see Schmitt, 1984). On the contrary, by its very nature money is a flow, a numerical vehicle whose existence is limited to the instant a payment is carried out. Monetary stocks do exist, yet they are not made up of money but of income, notably of the bank deposits resulting from the association of money with produced output. Bank money is immaterial and it makes no sense to speak of its quantity or its stock. It is only when the numerical form is filled with produced output that money is transformed into a positive amount of income (Figure 9), so that it is hopeless to look for the hypothetical equilibrium between money and output.

Correctly understood, the quantity equation is an identity in all its forms. The level of prices cannot emerge, therefore, from an adjustment of two supposedly distinct stocks. The analysis of inflation is far more complex than monetarism claims, and must be consistent with the fact that logical identities are not subject to conditions of equilibrium.

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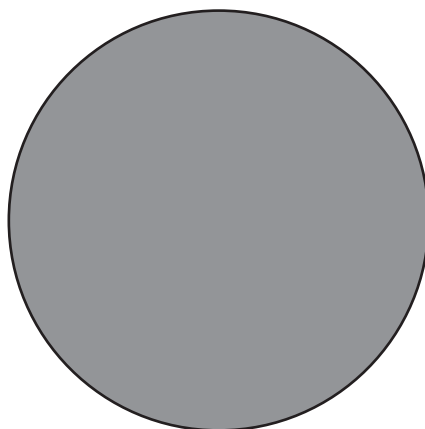


Figure 9 *Income as the “unity” of money and output*

See also:

Bank deposits; Bank money; Classical dichotomy; Commodity money; Friedman rule; Hume, David; Inflation; Monetary aggregates; Monetary targeting; Money neutrality; Money supply; Quantity theory of money; Quantum macroeconomics.

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Monetary aggregates

Despite all the attention paid to it, money is still poorly understood, both by the general public and by leading economists. Whilst the history of economic thought is punctuated by controversies about its nature and essence, no definition of money is today unanimously accepted among economists. Confronted with these difficulties, the latter have favoured an empirical approach, whereby money is defined by the main functions it performs within the economic system (see Bofinger, 2001, pp. 3–14). Among these functions – that money serves as a means of payment, a store of value, and a unit of account – economists have mostly concentrated on the means-of-payment function to distinguish money from other financial assets. To this end, they seek to measure the supply of money by considering the ease with which financial assets can be converted into means of payment – these assets being classified in various aggregates according to their degree of liquidity.

The term “aggregate” refers to the gathering, in a single entity, of heterogeneous but

consistent elements. In economics, an aggregate is a synthetic magnitude that represents a set of statistical data, such as certain items of national accounts. By analogy, a monetary aggregate brings together various balance-sheet items of the banking system. More specifically, certain liabilities of these balance sheets are classified according to their degree of payability, to wit, their degree of liquidity if one takes the point of view of the non-banking sector, for which money is an asset. In this respect, four monetary aggregates are traditionally considered in the literature:

- M0 (or “high-powered money”) represents the whole liabilities of the central bank, that is, cash in circulation and banks’ operational deposits (banks’ reserves) at the central bank;
- M1 represents the sum of M0 and demand deposits of the non-banking sector at commercial banks;
- M2 represents the sum of M1 and savings deposits of the non-banking sector at commercial banks; and
- M3 represents the sum of M2 and time deposits of the non-banking sector at commercial banks.

A fifth monetary aggregate (M4) includes the deposits of the non-banking sector with near-banks.

Such taxonomy does not inform on the endogenous or exogenous nature of money – that is, the causality between the supply of money and the price level. The composite measure of the supply of money played a key role for monetary targeting strategies that were implemented in the 1980s by several central banks (see Rossi, 2008, pp. 232–7). In these strategies, one or several monetary aggregates are selected as an intermediate goal of monetary policy – the central bank targets an annual growth rate of a relevant monetary aggregate (in line with the attainment of the ultimate goal of monetary policy) – or as an indicator of monetary policy – monetary aggregates represent a harbinger of inflationary pressures. Against this backdrop, money is considered in the theoretical underpinnings of monetary targeting strategies (namely the equation of exchange of the quantity theory of money) as an exogenous and perfectly controllable magnitude.

The use of a composite measure of the supply of money allows the central bank to assess the stance of its monetary policy and provides it with a tool to estimate a variable (the supply of money) on which the aforementioned bank has a significant influence (under the money multiplier effect). Within a monetary targeting strategy, the central bank is then able to assess whether its monetary policy respects the path dictated by a pre-established rule: Friedman (1968, pp. 14–17) advocates in this respect a steady growth of the supply of money, in line with the expected growth of output. Now, for the purpose of estimating the total supply of money, the central bank has to choose the monetary aggregate that best explains the macroeconomic variables that the central bank seeks to influence (such a criterion for choosing a monetary aggregate is similar to the functional criterion explained above). In this (monetarist) perspective, the relevant aggregate should be the one that best predicts the level of nominal income (see Friedman and Schwartz, 1963).

The problem with a relevant monetary aggregate lies in the instability of the connection between the aforementioned aggregate, or the set of monetary aggregates, and

the macroeconomic variables that the central bank seeks to influence (according to the monetarist view regarding the role of monetary policy in macroeconomic stabilization), namely real income in the short run (under a money illusion that hits some economic agents) and the price level in the long run (under the neutrality of money and the homogeneity postulates) (see Porter et al., 1979). Indeed, the relevant monetary aggregate is space- and time-varying: deregulation and financial innovations that have occurred in developed countries since the 1970s have changed the aforementioned aggregate several times. Improvement of payment technologies have also broadened the class of financial assets considered as money, thereby downplaying the reliability of the functional approach mentioned above. More recently, the securitization of bank loans, lying at the root of the global financial crisis that burst in 2008, testifies to the development of the shadow banking system, which is at the origin of new forms of money or near-money, such as securities pledged in repurchase agreement operations.

The contingency as regards space and time of the relevant monetary aggregate sheds some light on the failure of monetary targeting strategies, but also on the logical flaws of the theory on which these strategies rest. Indeed, efforts for selecting and predicting the evolution of the aforementioned aggregate are rendered obsolete by the endogenous nature of money, since in today's economies the demand for money (whose instability is now firmly established) determines the supply of money. Therefore, according to this line of thinking, a change in the supply of money is not the cause, but the consequence of a change in the price level (see Moore, 1988). As a result, attempts to control the supply of money have always been doomed to fail (a given growth rate of the relevant monetary aggregate is not an adequate intermediate goal of monetary policy), while the level of the relevant monetary aggregate, or the set of monetary aggregates, is not a harbinger of inflationary pressures (monetary aggregates are not a relevant indicator of the stance of monetary policy). For this reason, many central banks adopted a new framework for monetary policy during the 1990s, to wit, inflation targeting (see Bernanke and Mishkin, 1997), in which monetary aggregates are one among many indicators reflecting the credit policy of banks. All in all, looking at the liabilities of banks does not offer a whole picture of money, since the latter is not a financial asset for the non-banking sector – it is a mere bookkeeping entry devoid of any intrinsic or extrinsic value, unless it is associated with output through the payment of wages, as the monetary theory of production explains (see Graziani, 2003).

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See also:

Cash; Endogenous money; Financial crisis; Friedman rule; High-powered money; Inflation targeting; Monetarism; Monetary aggregates; Monetary circuit; Monetary targeting; Money multiplier; Money supply; Quantity theory of money; Repurchase agreement; Reserve requirements; Shadow banking.

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Monetary approach to the balance of payments

The monetary approach to the balance of payments (BoP) was developed during the 1960s under the Bretton Woods system of fixed exchange rates. Its academic origins are associated with the University of Chicago and the London School of Economics and Political Science, where Harry Johnson was teaching. Its parallel policy-making origins are credited to the research department of the International Monetary Fund (IMF) led by Jacques Polak. The IMF contributed to the “institutionalization” of the approach as the official way of thinking about how the world economy worked across central banks and governments. With the demise of the Bretton Woods system, the approach was adapted to the case of flexible exchange rates, and thus also became one of the major theories of nominal exchange rate (NER) determination, referred to as “the monetary approach to the exchange rate”, or often simply “the monetary model”. The latter should be distinguished from the monetary approach to the BoP under peg, described in detail by Frenkel and Johnson (1976) and by Rhomberg and Heller (1977).

Proponents of the monetary approach to the BoP, such as Johnson (1972) and Frenkel (1976) – see also Gandolfo (2001, chs 12 and 15) and Mark (2001, ch. 3) – trace its intellectual roots back to Hume (1752 [1955]), Wheatley (1803), Ricardo (1821 [1911]) and Cassel’s (1918, 1921) revival of ideas of the Salamanca School in the sixteenth century related to the proposition of purchasing-power parity (PPP). The classical (or Humean) price–specie flow mechanism under the gold standard – also assuming (implicitly, in Hume) the quantity theory of money later to be formulated by Fisher (1911) – is of particular relevance as a direct precursor of the monetary approach to the BoP. The main similarity is that the ultimate cause of BoP flow disequilibria is perceived to lie in money stock disequilibria themselves. Consistent with the Humean tradition, the BoP is viewed essentially as a monetary phenomenon.

The key assumptions underlying the monetary approach to the BoP are as follows:

- (1) PPP is a long-term equilibrium condition in the international goods market, aggregating the law of one price for each individual good (or service).
- (2) With perfect substitutability between domestic and foreign assets, the uncovered interest(-rate) parity (UIP) condition ensures equilibrium in the international asset market.
- (3) All prices are flexible, except the exchange rate, which is credibly pegged.
- (4) As production operates at the level of full employment, real income is fixed.
- (5) A stable money demand function exists.

The monetary approach to the BoP has usually been studied in its small open-economy (SOE) version, complemented by the rest of the world (RoW), as we do next. Employing the outlined assumptions and invoking market clearing in all (goods, asset and money) markets, the monetary approach to the BoP is solved for its model-implied (general) equilibrium. This equilibrium solution can be summarized conveniently by a single equation that links money supply, ms_t , to money demand, md_t , as follows:

$$ms_t = k i_t + (1 - k) dc_t = s + p_t^* + a y_t - b i_t^* + u_t = md_t$$

The equation above – written in the logarithms of all t -indexed variables, except for the RoW interest rate, i_t^* , equal to that in the SOE via UIP under the (credible) peg regime, and the money demand disturbance, u_t – contains in a dense form the main insights from the monetary approach to the BoP. It is clear from the money demand function (on both sides of the third equality sign above, with s denoting the log of the fixed NER, $a > 0$ the output elasticity of money demand and $b > 0$ the interest-rate semi-elasticity of money demand) that if the SOE experiences (i) positive income growth ($y_t \uparrow$), and/or (ii) declining interest rates ($i_t^* \downarrow$), and/or (iii) rising prices ($p_t^* \uparrow$), and/or (iv) positive money demand shocks ($u_t \uparrow$), then the demand for nominal money balances will grow ($md_t \uparrow$). The equilibrium solution to the model further shows that if this increased demand for money is not satisfied by an accommodating increase in domestic credit (dc_t), the nation will obtain the additional money it desires to hold by selling goods and/or assets abroad and, thus, running an overall BoP surplus – that is, an increase in international reserves, ir_t ($0 < k < 1$ is the fraction, assumed constant on average, of international reserves in the monetary base). If, on the other hand, the central bank engages in a domestic credit expansion that exceeds the growth of money demand, domestic agents will eliminate the excess supply of money (they do not want to hold) by spending or investing it abroad to acquire goods and/or assets and, thus, running an overall BoP deficit – that is, a decrease in international reserves. Consequently, the money supply (on both sides of the first equality sign in the equation above) in the monetary model under peg is endogenous – that is, determined by the specified equilibrium solution. In effect, stock disequilibria in the money market are corrected by flow adjustments in international reserves.

Apart from questioning the generality of its key assumptions, other limitations of the monetary approach to the BoP have been pointed out. For instance, Polak (2001) discusses two approaches under the name of this entry that eventually converged (see Frenkel et al., 1980). His major claim is that the version developed at the IMF is an evolutionary extension of the Kahn (1932) and Keynes (1936) multiplier model to an open economy, and that its empirical implications with respect to income and imports are well supported. He then describes the alternative long-run version (which we focused on above), elaborated by Johnson and Mundell at the University of Chicago, as “anti-Keynesian and self-proclaimed revolutionary”, and whose “short-run tests prove statistically meaningless”. By contrast, other researchers, in particular Magee (1976), claim decent empirical success of the approach, pointing to studies included in the volume edited by Frenkel and Johnson (1976). Beyond the controversy over empirical support, a well-known limitation of the approach is the lack of monetary–fiscal interactions. Further limitations could be seen from various other methodological perspectives or country-specific macroeconomic or institutional frameworks.

See also:

Bretton Woods regime; Hume, David; International Monetary Fund; Quantity theory of money; Ricardo, David.

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Monetary circuit

The monetary circuit describes an approach to monetary macroeconomics and economic activity through a number of sequential steps in chronological time involving the creation and ultimate destruction of money. The theory of the monetary circuit is also a theory of accumulation and distribution. It is anchored in what Keynes (1933 [1973]) called a "monetary theory of production", and is in many ways what Le Bourva (1992, p. 454) has called a process of "alternating movements of creation and cancellation of money".

In neoclassical models, the working of the economic system can be explained without any reference to money: supply and demand, production functions, investment, employment, prices, wages, output and economic growth can all be explained without money: it is what Schumpeter (1954, p. 265) called "Real Analysis".

A monetary economy, however, is one where money, and more specifically bank credit, plays an important role. It therefore does not validate the classical dichotomy, where real and monetary variables can be analysed separately. Indeed, there can be no discussion of production, output, employment and economic growth without first discussing how money is integrated into the economic system. As Schumpeter (1954, p. 265) argued, "Monetary Analysis introduces the element of money on the very ground floor of our

analytic structure and abandons the idea that all essential features of economic life can be represented by a barter-economy model. [. . .] [I]t has to be recognized that essential features of the capitalist process may depend upon the ‘veil’ and that the ‘face behind it’ is incomplete without it”. It is in the sense that Lavoie (1987) calls it a theory of “a dynamic *history* of the production process” (ibid., p. 91, emphasis added).

Accordingly, money is always and everywhere an endogenous phenomenon: it is created when private agents, mostly firms but wage earners as well, borrow from banks in order to meet the needs of production (or, in the case of wage earners, consumption). Money has always been endogenous, and was not the result of the evolution of the banking system (see Rochon and Rossi, 2013).

The monetary circuit begins with the central bank setting the rate of interest following its policy goals (see Rochon and Setterfield, 2008, for a discussion of three interest-rate rules from a post-Keynesian perspective). This rate of interest is an administered price, and an income distributive variable.

Once this interest rate is set, private agents (mostly firms) will make their production plans and will need to have access to credit to cover the costs of production and, in some versions of the monetary circuit, investment (see Parguez and Seccareccia, 2000; Cottin-Euzeol and Rochon, 2014). Firms will then demand credit from banks and, provided that the latter judge them creditworthy, will receive the necessary credit. This is what Graziani (2003) calls “initial finance”. The need for credit applies equally to consumption-goods and investment-goods firms.

This implies three fundamental conclusions: (i) firms do not finance investment through prior savings; (ii) banks do not need prior deposits or reserves to lend, thereby casting doubt on the validity of quantitative easing as a useful policy; (iii) the creation of money is synonymous with production.

Once production has been financed, money is released into circulation once firms pay workers. This corresponds to a transfer from the firms’ bank account to that of workers. Once workers receive wages, they spend them on consumption goods, at which point money flows back to firms, in what Graziani (2003) has called “final finance”.

Once they have consumed, workers then decide on how to allocate their savings. The choice involves either holding their savings in liquid form or purchasing financial assets, what Rochon (1999) has called hoarded and financial savings respectively.

This distinction is important as these different forms of savings play two very important roles. Financial savings will be divided between various Treasury bonds and private sector stocks, at which point money flows back to firms, which will then be able to reimburse banks and extinguish their debt. At this point, money is destroyed. As Keynes (1937 [1973], p. 221) put it, “consumption is just as effective in liquidating the short-term finance as saving is [by which Keynes meant financial savings]. There is no difference between the two”.

Hoarded savings, however, represent a loss for firms; that is, what they cannot get from households’ consumption and households’ purchases of financial assets. It is the observed increase in the money stock (Lavoie, 1992).

Sharing many affinities with other heterodox approaches, in particular the horizontalist approach to post-Keynesian economics, the monetary circuit makes clear the possible sources of crises: the lack of aggregate demand stemming from a low demand for credit,

or the banks' refusal to lend, the increased appetite for hoarded savings, and the increased polarization in incomes.

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See also:

Bank money; Endogenous money; Finance and economic growth; Interest rate rules – post-Keynesian; Money and credit.

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Monetary History of the United States, 1867–1960

According to Friedman and Schwartz (1963, p.3), *A Monetary History of the United States, 1867–1960* (hereafter *AMH*) is conceived as a book “about the stock of money in the United States”. Its aim is to account for the changes undergone by the money stock, to analyse their subsequent influence over the course of time, and to highlight the major role played by money in economic and political events during the period covered by the book.

The authors' methodology identifies monetary shocks through non-statistical procedures (Romer and Romer, 1989, p.122), and has therefore come to be known as the “narrative approach”. The novelty of the book lies in the use of this approach in conjunction with a formal statistical apparatus (Friedman, 1989, p.178), whose use has nevertheless been subject to criticism as a form of “positivism” and “scientism”, on the grounds that the authors “use time-series regressions as if they provided the same kind of ‘proofs’ as controlled experiments in the natural sciences” (Kaldor, 1970, p.2).

The chapter devoted to the “Great Contraction” is most representative of the analytical and critical stance adopted by the authors of *AMH*. The “Great Contraction” is explained by the fact that the US Federal Reserve “failed to act vigorously to stem the first liquidity crisis in the fall of 1930” (Friedman and Schwartz, 1963, p.419), as

a “[p]revention or moderation in the decline of the stock of money [. . .] would have reduced the contraction’s severity and almost as certainly its duration” (ibid., p. 301).

Beyond the criticism levelled in terms of policy-making, Friedman and Schwartz (1963) shed light on the politics of central banking and the complexity of the balance of power within the institution. They demonstrate how the change in the locus of power in the US Federal Reserve System affected decision-making, and explains the passivity of the policy it carried out: “[i]n 1930, New York’s commanding role in the System was reduced when the other Banks and the Board succeeded in limiting its freedom of action” (ibid., p. 532), while the Board took on a dominant role through the Banking Act of 1935. According to the authors,

the transfer of power from a financial institution in the active financial center of the country to a political institution in the active political center fostered a shift in policy from the kind of continuous day-to-day concern with market activity [. . .] that is the mark of the active [. . .] participant in economic matters, to the discontinuous occasional pronouncement and enactment of legislation or rules, that is the mark of political activity. (Ibid., p. 533)

The authors also understand monetary policy-making as the history of shifts in ideology, upon which they rely in order to demonstrate how, at the different stages of the period covered in *AMH*, economic changes corroborate the hypothesis that “money does matter”. In the 1930s, fiscal measures gained precedence over monetary measures, while the view that “money does not matter” became widely held and was fostered by the Keynesian revolution (Friedman and Schwartz, 1963, p. 533). In this perspective, money is “a passive factor which chiefly reflects the effects of other forces [and] monetary policy is of extremely limited value in promoting stability” (ibid., p. 300). This is naturally challenged by the authors, who argue that the “Great Contraction”, and the flawed monetary policy that contributed to its severity, are, instead, evidence of the importance of monetary forces. In particular, they identify three “crucial experiments”, in January–June 1920, October 1931, and July 1936–January 1937, where “economic changes were the consequence of the deliberately undertaken monetary actions” (ibid., p. 690). Another inflection occurred in the post-Second-World-War era: the reaffirmed responsibility of government in supporting employment, as well as the fiscal constraints imposed by the Korean War, and subsequently by the Cold War, resulted in a “shift of emphasis to monetary policy as a means of promoting ‘full employment’ and price stability” (ibid., p. 596).

AMH appears as a long demonstration of the validity of the quantity theory of money, concluding with “[t]he existence of an important independent influence running from money to income”, despite the variability of monetary arrangements (Friedman and Schwartz, 1963, p. 694). The relationship between money and economic activity is conceived as a “[m]utual interaction, but with money clearly the senior partner in longer-run movements and in major cyclical movements” (ibid., p. 695), with changes in income and prices observed in shorter-run and milder movements. The validity of this hypothesis has been questioned by Kaldor, for whom money supply is endogenous, and not, as held by monetarists, exogenously determined by monetary authorities (Kaldor, 1985, p. 3). Hence the causal relationship between money and income identified by Friedman and Schwartz (1963) is flawed (Kaldor, 1970, p. 10).

AMH stands as a significant contribution to monetary history and a landmark of monetarist theory. Through its highly adverse effects in terms of output and unemployment,

the “monetarist era” of the central banks in both the United States and the United Kingdom, in the early 1980s, is an illustration of the book’s limits as a prescriptive contribution to monetary policy-making.

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See also:

Endogenous money; Federal Reserve System; Friedman rule; Monetarism; Money neutrality; Money supply; National Banking Acts; Quantity theory of money.

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Monetary policy and income distribution

The gap between high- and low-income households has widened significantly in most developed economies since the 1980s (Alvaredo et al., 2013). In the United States, for example, the income share of the top 10 per cent of earners was about 33 per cent in 1980; it reached 48 per cent in 2012. We have to go back to the 1930s to find similar levels of inequality in that country. Many wonder whether monetary policy exacerbated this trend.

The general answer from central banks is that monetary policy did not contribute to this development. Indeed, inequality is neither central banks’ main focus nor an issue on which they regularly communicate. When they do make reference to the topic, they often attribute rising inequality to the increasing role of skill-biased technology, growing trade openness, and unemployment (see for instance Greenspan, 1998; Coeuré, 2012; Bernanke, 2013). They also argue that monetary policy has countercyclical effects on employment during recessions, and that it reduces inequality by providing stable prices and macroeconomic conditions over the medium run.

Mainstream economists echo these positions: they emphasize that short-run effects of monetary policy on income inequality, if they do occur, are transitory, and that it is the long-run impact on inflation that matters. They also argue that low inflation rates benefit low-income households more than richer ones, for two main reasons: first, low-income households are less able to protect their living standards from inflationary shocks than high-income households, because their access to financial markets is limited. Indeed, empirical studies find that low-income individuals are proportionally more reliant on cash than others, and thus more exposed to seeing their purchasing power hit by inflation (Ferreira et al., 1999). Second, lower inflation rates slow down the erosion of the real value of non-indexed public transfers, such as unemployment benefits and pensions. Low-income households are more dependent on them than high-income households. As

a result, according to mainstream theory, central banks that successfully target low inflation rates are also helping to dampen income inequality.

Other economists, however, challenge this view. In a sample of OECD countries, Galli and van der Hoeven (2001) find that the relation between inflation and income inequality is nonlinear. For low inflation rates (below 12 per cent), the link is negative: lower inflation rates are associated with higher income inequality. Their result is backed by Monnin (2013), who enlarges Galli and van der Hoeven's (2001) analysis in order to control for several other factors influencing income inequality.

Similarly, for the United States, Coibion et al. (2012) find that restrictive monetary policy interventions to lower inflation rates systematically increase income inequality. Empirically, they show that contractionary monetary policy shocks are followed by higher labour earnings at the upper end of the income distribution and lower labour earnings for those at the bottom. They also observe that business income declines after a contractionary monetary policy shock, while financial income rises sharply, and that the increase in financial income more than offsets the loss in business income. As a result, the total earnings of high-income households increase with contractionary monetary policy while those of lower-income households go down. Government transfers dampen the resulting increase in income inequality, but do not reverse this phenomenon.

Post-Keynesians provide another perspective on the distributive effects of monetary policy by analysing rules that central banks could adopt to stabilize income inequality and making the case for a "fair rate – or Pasinetti – rule" (Lavoie and Seccareccia, 1999, p. 543). They propose to set the real rate of interest equal to the growth rate of productivity, and argue that this approach preserves the inter-temporal distribution between borrowers and lenders as it keeps the purchasing power of borrowed or lent funds constant in terms of labour hours (Rochon and Setterfield, 2007).

In view of the absence of a widely accepted theoretical model and empirical findings partially contradicting theory, more research is needed. Economists have to better understand, both empirically and theoretically, the channels through which monetary policy influences income inequality. There is as yet no solid and widely accepted economic explanation on why top earners' income increases with contractionary monetary policy, even if this is shown empirically. Further, many studies focus on one country only. This makes it difficult to disentangle the impact of monetary policy from the specific institutional framework. Long-run cross-country studies are needed to highlight global regularities between monetary policy and income inequality. Moreover, monetary policy might have an impact on income inequality, but it is surely not the single economic driver of the latter. Skill-biased technology and trade openness are two other factors that are strongly established in the literature. Controlling for these and other economic variables is crucial to better assess the impact of monetary policy on income inequality in the future.

PIERRE MONNIN

See also:

Inflation; Interest rate rules – post-Keynesian; Monetary policy transmission channels; Monetary theory of distribution; Policy rates of interest.

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Monetary policy in a small open economy

Contrary to what is commonly believed, a small open economy is not just a "price taker" in the global economy. It is an economy whose structure of prices and production is severely impacted by foreign prices, precisely because it is extremely vulnerable to exchange-rate volatility. Consequently, the assets and liabilities of such an economy are highly dependent on monetary and exchange-rate policies.

The standard macroeconomic textbook usually describes a "small open economy" as a mere extension of some "basic" model, and conceived out of the difficulties of foreign trade, in both commodities and capital markets. This condition introduces a fundamental analytical limitation, in so far as it ignores the impact of exchange rates on the formation of (real and nominal) prices and the increasing importance of assets and debts in the economy. These phenomena have been shown to be essential for the analysis of stability of a number of countries, even if this analysis is kept within the framework of the standard monetary model of the balance of payments.

The standard textbook presents the argument following two considerations:

- (1) A short-run trade imbalance can be managed by taking a short-run debt, in so far as it responds only to a temporary external shock. A permanent disequilibrium would call for an adjustment in both the exchange rate and the interest rate (see Chacholiades, 1981).
- (2) Adjustment trade-offs exist between the level of income and the exchange rate. A price taker would do better with flexible exchange rates, rather than fixed exchange rates, and a country should keep its economy open to capital flows (see Ball, 1999).

Yet trade imbalances can be structural, because they respond to trade conditions. As such, a small open economy may be unable to restore equilibrium via exchange-rate

adjustments, because its terms of trade will not allow equilibrating trade flows. This has been a consistent claim from “structuralists” (see Economic Commission for Latin America and the Caribbean, 1998).

Both these arguments, however, are limited, because they do not analyse the way assets and debts, for firms and banks, are affected by exchange-rate adjustments. The usual framework has led to the accumulation of external public debts, following anti-inflationary policies, which rest on using the exchange rate as a nominal “lever”. If banks and firms perceive that exchange rate as an equilibrium magnitude, then there is no problem. But inflation, even if it is moderate, erodes their position and agents react by creating reserves in US dollars. As a result, speculators begin to bet against the central bank. Eventually, the central bank loses reserves, and a sudden exchange-rate adjustment leads immediately to hyperinflationary shocks, which are the result of misconceived monetary policies, by central banks blindly following an inflation target.

Furthermore, the standard approach carries out the analysis within the framework of the interest-rate parity theorem of exchange rates. This theorem considers that there exists a trade-off between exchange rates and interest rates. As such, there is a monotonic inverse relation between them, along a line that can be taken as a price line. Once monetary authorities decide on an interest rate, there is only one equilibrium exchange rate. The difficulty with this approach is that a small open economy presents not one but a number of different price lines, which may not necessarily be straight. Consequently, when the central bank fixes the interest rate, there may be two or more equilibrium exchange rates corresponding to the different sectors of the economy. The degree of openness of the economy, however, does not allow for different exchange rates: there is only one exchange rate for each pair of currencies, which the central bank will in practice use to target inflation, even though it may be harmful for some productive sectors of the economy.

If monetary policy adopts the standard view of inflation targeting, the dominant variable for a small open economy thus becomes the exchange rate, which in turn becomes the critical “lever” over inflation expectations. Consequently, the exchange rate is not just a “long-run” instrument, although it is based on a shortsighted view of the problem at stake.

Now, since a small open economy may face a higher degree of uncertainty on trade and capital flows, long-term contracts will be denominated in US dollars or some other foreign currencies. Dollarization then turns into the dominant form of liquidity preference for firms and banks. The consequence is that once a country is caught in a process of overvaluation of the exchange rate, the accumulation of debts in US dollars works against the possibility that the monetary policy target may prevail. That is why an exchange-rate adjustment turns into a major debt crisis, either in the form of long-term stagnation or high inflation.

The conclusion is that there is no way in which standard market mechanisms in foreign-exchange markets and capital markets can call for equilibrium.

The policy constraint then has to be reconsidered. The economy demands that, for the sake of productivity, growth and the defence of the terms of trade, the exchange rate has to float (Mántey, 2010). Capital mobility has to be kept under control to avoid overvaluation of the exchange rate or short-run liquidity shocks. Domestic interest rates then

would not require a significant difference from world interest rates. Yet trouble may arise when monetary policy adopts an inflation target based on pegging the exchange rate.

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See also:

Dollarization; Hyperinflation; Inflation targeting; Monetary approach to the balance of payments.

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Monetary policy indicators

Monetary policy indicators are variables used to provide information to monetary authorities on the current or expected future state of the economy. When monetary policy indicators are not consistent with central banks' expectations, they may signal that interest rates and monetary policy must be reconsidered. This happens because the latter may otherwise give rise to undesirable outcomes such as inflation, negative output gap, unemployment, asset price bubbles, and prolonged recessions with respect to stated monetary policy objectives and targets by central banks. The term "indicator" nowadays is different from what was meant in the past. Brunner and Meltzer (1967) initially introduced the "indicator problem" as being related to the identification of a combination of variables, which signal best the "thrust" of current monetary policy on the state of the economy.

Monetary policy indicators are different from other categories of variables such as monetary policy instruments, goals and targets (McCallum, 1988). Monetary policy instruments include, for example, short-term interest rates, which can be controlled directly by central banks. On the other hand, monetary policy goals include variables such as inflation or output (and unemployment). Finally, monetary policy targets are variables such as M1 and nominal GDP with regard to which monetary authorities choose a time path in order to achieve the desired levels of their goal variables. In contrast to those categories of variables, monetary policy indicators are useful exclusively for their informational content.

There is a great number of variables that may be considered as monetary policy indicators. For example, this category may include raw commodity price indices of the agricultural and mineral sectors of the economy, interest rate spreads, foreign exchange rates, and the real (that is, deflated) magnitude of M3.

Heterodox criticism mainly points out the issue of reliability of monetary policy indicators. This is especially relevant for indicators such as interest-rate spreads, stock

prices and housing prices, which are often influenced by volatile agents' expectations. On the other hand, because the structural equations in heterodox models are different from standard models, the primary emphasis of the criticism of heterodox approaches is directed to the use of monetary policy instruments, goals and targets. Thus, the informational content of monetary policy indicators, as they are utilized by standard theory, is attributed secondary importance.

Furthermore, the utilization of monetary policy indicators is more a practical policy concern than a theoretical issue. The basic questions with regard to monetary policy indicators are the following: (i) to what extent should the conduct of monetary policy utilize monetary policy indicators with informational content in order to provide reasonable guidelines? (ii) Does a response to additional variables make sense as part of a general policy that leads to better economic outcomes?

The role of the business cycle is important in addressing these questions. For example, in periods of economic and financial stability, the use of monetary policy indicators adds very little incremental value over the estimates of inflation and output. Only a small amount of information is used that is not reflected in the main variables that enter the policy-making process. As a result, there are minor improvements in the fine-tuning of a monetary policy rule.

However, during periods of financial turmoil, the relevance of monetary policy indicators is noteworthy. For example, although official statistics did not indicate that real GDP or inflation rates were declining to warrant the application of a simple Taylor rule, the US Federal Reserve aggressively reduced its operating target for the federal funds rate in late 2007 and January 2008. This discrete form of intervention took place because the US Federal Reserve paid attention to changes in monetary policy indicators such as the unusual increases of spreads on interest rates (and their volatility), which showed that serious stress had been developing in the financial sector (Cúrdia and Woodford, 2010). Similarly, in the United Kingdom, real GDP growth in the third quarter of 2007 was still robust, although some of the survey data inherent in leading monetary policy indicators had begun to indicate future weakness (Buiter, 2008).

Overall, when financial markets function properly, monetary policy responds effectively to the flow of economic data about production, employment and inflation. When a financial disruption occurs, however, greater attention must be paid to monetary policy indicators of market liquidity, credit spreads and other financial market magnitudes. These magnitudes reflect broadly a greater contemporary concern of policy-makers under uncertainty.

Since the early 2000s, monetary authorities have come to watch more closely whether uncertainty with regard to the state of the economy is skewed in one direction or another, or whether the economy may exhibit excess kurtosis, commonly referred to as tail risk. This form of diagnostics takes place within a "balance of risks" analysis, which reflects the behaviour of monetary policy indicators (Mishkin, 2010).

To sum up, the contemporary importance of monetary policy indicators arises because there is an apparent need for decisive and timely action on the part of central banks. As a result, beyond the modal outlook for the macroeconomy, monetary policy has evolved to reflect the evolution of the balance of risks in order to avoid adverse macroeconomic outcomes.

THEODORE KOUTSOBINAS

See also:

Bubble; Financial instability; Monetary aggregates; Monetary policy instruments; Monetary policy objectives; Output gap; Taylor rule.

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Monetary policy instruments

To accomplish its targets, the monetary authority must select whether to use the interest rate or the supply of monetary base as its instrument of monetary policy (Palley, 2006). The choice of the monetary policy instrument has been overwhelmed by the debate between monetarists and post-Keynesians. In the 1960s, Friedman (1968) recommended the adoption of the supply of monetary base as the optimal monetary policy instrument in a framework where the main target of the central bank was the inflation rate. In practice, the exogenous quantitative control of the monetary base involves not only the issue of money by the central bank but also the management of minimum bank reserves (that is, the reserve requirement rate), in order to influence the money multiplier and the banks’ credit strategies.

In the monetarist theoretical framework, considering that less money in circulation gives rise to less spending, the quantitative control of the monetary base and, therefore, of the money supply could dampen inflationary trends, as the demand for money is stable with respect to income. With this guideline for monetary policy, the interest rate, as the central banks’ instrument, has been associated with the adoption of discretionary policies aimed at temporarily reducing the natural rate of unemployment. In fact, Friedman’s approach to the Phillips curve trade-off between inflation and unemployment enhances a critique on the active role of central banks to manage interest rates in order to achieve employment or real gross domestic product growth as ultimate targets. In open economies, Friedman’s policy proposal also supports the adoption of flexible exchange rates, in conjunction with the control of the monetary base, so as to rescue the autonomy of monetary policy and preserve price stability.

However, the acceptance of the post-Keynesian endogenous money theory challenges the monetarist choice of the monetary policy instrument. From a post-Keynesian standpoint, the monetary policy instrument is the interest rate while the supply of monetary base is endogenously determined by market forces (Minsky, 1982). In this approach, any attempt to manage the supply of monetary base as the policy instrument would provoke strong volatility in the evolution of the interest rate (Palley, 2006). Besides, central banks do not have full power to influence cyclical credit conditions through minimum bank

reserves requirements. At the pragmatic level, the management of the interest rate as a policy instrument, mainly through open-market operations, reveals the interaction between banks' liquidity preference and the central bank in the money market. The negotiation of eligible securities with banks, most of them executed on an agreement on trading (repo operations), sets the interest rate and affects the overall liquidity in the economy.

In organized financial markets, as Keynes (1936) warned, the influence of the central bank's interest rate on the economic system as a whole depends mainly on the impacts of the expectations about future interest rates on banks' decisions. In a monetary economy, the central bank's uncertain influence on banks' portfolios also depends on the features of the institutional set-up, where expectations on risks and returns are built in a framework of imperfect substitutability among assets (Minsky, 1982). In this framework, central banks cannot prevent the fact that sudden portfolio changes could affect levels of spending, income, employment and prices.

Today, the interest rate has become the dominant monetary policy instrument (Palley, 2006). Looking back, the early 1980s proved to be a transition period in terms of monetary policy (Taylor, 1999). After the monetarist experiences of Thatcher and Volcker, there has been a pragmatic shift from the supply of the monetary base to the interest rate as monetary policy instrument. The recognition that the control of the monetary base could not only impose extreme volatility to the interest rate but also deeply affect the whole economy in fact challenged the previously stable empirical relationship between money supply, demand for money, prices, and income supported by monetarist theory (Palley, 2006).

At the theoretical level, the so-called "New Consensus in Macroeconomics" has favoured the short-term interest rate as the policy instrument in conjunction with inflation targeting (Arestis, 2009). The New Keynesian so-called "Taylor rule" has increasingly turned out to be adopted by central banks to manage the interest rate as the policy instrument (Monvoisin and Rochon, 2006). In this policy approach, the central bank, mainly through open-market operations, sets the short-term interest rate in order to adjust its level in response to changes in inflation and output (Taylor, 1999). In a framework of capital account openness, however, the autonomy of monetary policy, aimed at stabilizing prices, subordinates fiscal policy and requires either floating or managed floating exchange rates in conjunction with the management of the interest rate as the inflation targeting policy instrument.

Nevertheless, from a post-Keynesian perspective, the new-Keynesian justification for the shift to the interest-rate policy instrument is pragmatic and is not centred on the theoretical standpoint of endogenous finance (Palley, 2006). In the current deregulated global order, central banks' interest rate, as the policy instrument, has been challenged by the expectations of investors and the arbitrage/speculation fostered by global players in financial markets (Grabel, 2000). This scenario has been conditioning the room for manoeuvre of central banks in order to manage the interest rate as a policy instrument. In addition to the role of market forces, the evolution of the interest rate as a policy instrument has not been independent of the global financial architecture, where the actions of the US Federal Reserve, at the top of the hierarchy of central banks, strongly affects the price of all assets.

MARIA ALEJANDRA CAPORALE MADI

See also:

Central bank money; Credit guidance; Endogenous money; Federal Reserve System; Inflation targeting; Interest rates setting; Monetarism; Monetary policy indicators; Monetary policy objectives; Money multiplier; Money supply; Open-market operations; Phillips curve; Policy rates of interest; Quantity theory of money; Repurchase agreement; Reserve requirements; Rules versus discretion; Taylor rule.

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Monetary policy objectives

The primary objective of post-Keynesian monetary policy is to keep unemployment rates low. Other objectives, such as increasing investment, expanding capacity utilization, and reducing income inequality are also important. Keeping unemployment rates low implies that low interest rates are desired to keep investment and consumption at high levels, hence increasing aggregate demand and expanding production. Unemployment is thus viewed as an effective demand problem, brought about by the inability of savings to equal investment (Say's law). In this view, the economic system does not naturally gravitate towards full employment or a stable equilibrium. The central bank can use monetary policy and fiscal policy to alleviate business cycle fluctuations and attempt to restore inadequate aggregate demand.

The post-Keynesian view of the objectives of monetary policy contrasts sharply with the mainstream of the profession. The monetary policy objectives of the mainstream (represented by the New Consensus Macroeconomics, NCM) are primarily concerned with a rule-based interest-rate policy that is dictated by the Taylor rule, based on the concept of Wicksell's natural rate of interest. The goal of monetary policy within this framework is to keep the actual interest rate from deviating from the natural rate of interest, which in turn will control inflation and deflation as well as output gaps. The emphasis of mainstream monetary policy has been on the control of inflation, with little importance placed on unemployment. Most central banks around the world now have some sort of interest rate rule (generally a Taylor-like rule) as well as inflation targets to dictate their monetary policy (Rochon, 2009).

Post-Keynesians deny the existence of a Wicksellian natural rate of interest. They view the interest rate as a distributional variable, where changes in the rate of interest

affect income distribution, which then affects income and aggregate demand (ibid.). Hence, keeping interest rates low is a distributional policy decision, not a disequilibrium that causes inflation or deflation. In addition to the fact that income distribution affects aggregate demand, using monetary policy to make income distribution more even is a post-Keynesian monetary policy goal in itself.

Using monetary policy in an attempt to control inflation is based on an incorrect view of what causes inflation. Indeed, neoclassical models as well as the NCM assume that excess demand is the cause for inflation. To post-Keynesians, conflict over the distribution of income and production costs are the primary causes of inflation, which means that contractionary monetary policy “simply collapse[s] the economy until inflation is restored, and labour’s negotiating advantage is broken. This implies therefore that the use of monetary policy to fight inflation is costly, both in the short and long run” (Rochon, 2009, p. 64). Owing to the inadequacy of monetary policy, an incomes policy is preferred to fight inflation (Davidson and Weintraub, 1973) as well as strategic fiscal policy (Setterfield, 2007).

Further, mainstream theories, including neoclassical and New Keynesian models, argue that monetary policy has no long-run effect on output. In contrast, post-Keynesians view monetary policy as having both short-term and long-term impacts on output. Despite this, post-Keynesians question the effectiveness of monetary policy owing to both distributional effects and questionable as well as inconsistent transmission channels (see Wray, 2007). Instead, post-Keynesians emphasize fiscal policy as the primary source of business cycle control. The central bank has control over the short-term interest rate, but it is questionable how much control it has over the long end of the yield curve. As monetary policy affects the economic system through credit channels, the link between interest rates and investment is spurious at best.

Since the mainstream of the profession began embracing the Taylor rule and the NCM, post-Keynesians have re-emphasized the theory and application of monetary policy in order to provide an alternative explanation. Rochon and Setterfield (2007) discuss two different camps of post-Keynesianism in regard to interest-rate policy, namely the “activist” and the “parking-it” approaches. Those who advocate activist policy argue that rule-based interest-rate policy can still be used to target post-Keynesian goals, such as an unemployment, investment, or capacity utilization target instead of an inflation target. Those who advocate “parking-it” rules argue that monetary transmission mechanisms are complex and unpredictable. Monetary policy cannot be trusted to provide stable and consistent policy outcomes. As a result, these authors argue that the interest rate should be “parked” at a low level and fiscal policy should be employed to deal with policy targets. There are three subdivisions of the “parking-it” rule. The first is the “Smithin rule”, which recommends keeping interest rates low or close to zero (but positive), a long-term version of the “euthanasia of the *rentier*”. The second is the “Kansas City rule”, which advocates setting nominal interest rates to zero, which would create possibly negative real rates of interest. The third is the “Pasinetti rule”, or the “fair rule”, where the real interest rate is set to equal the rate of labour productivity. This has the effect of keeping the distribution of income between interest and non-interest income groups even, regardless of lending and borrowing activities (Rochon, 2009).

NATHAN PERRY

See also:

Inflation; Inflation targeting; Interest rate rules – post-Keynesian; Monetary policy and income distribution; Monetary policy transmission channels; Money neutrality; Natural rate of interest; Output gap; Rules versus discretion; Taylor rule; Wicksell, Knut; Yield curve.

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Monetary policy transmission channels – neoclassical

Monetary policy transmission channels are the sequences of relationships through which a given monetary policy instrument affects the economy. Transmission channels are founded upon a specific theory and modelling. Neoclassical channels, as their name indicates, rest upon neoclassical hypotheses (perfect financial markets and information), and focus on financial market prices (interest rates, stocks, exchange rates). Three main neoclassical channels are distinguished in the literature (see Boivin et al., 2011).

The money view or interest rate channel of the neoclassical synthesis (IS–LM model) relies on a money market to determine the interest rate with an LM curve. Only two assets are considered, namely money (deposits) and bonds. This channel starts, for instance, with the central bank implementing a monetary contraction (M) via open-market operations with bonds sales. Banks buy these bonds with their reserves, which therefore diminish. To restore their liquidity ratio (reserves/deposits), banks contract their deposits (money) on the liabilities side of their balance sheet. Hence, the money supplied by banks contracts, the LM curve shifts to the left and the real interest rate (r) increases for borrowers. According to the neoclassical capital-cost theory, this interest rate movement directly affects agents’ decisions about investment (I): a contractionary monetary policy curbs investment. Following the IS equation and the investment multiplier, monetary policy is *in fine* transmitted to output (Y). A schematic representation of it may be as follows:

$$\downarrow M \Rightarrow \uparrow r \Rightarrow \downarrow I \Rightarrow \downarrow Y$$

This channel is criticized for relying only on the long-term real interest rate. In practice, the central bank only controls its short-term nominal interest rate affecting only weakly long-term interest rates (see Bernanke and Gertler, 1995). The global financial crisis that burst in 2008 illustrates this limit: with the zero lower bound for the nominal policy rate of interest and inflation expectations in negative territory, the central bank imperfectly

controls the real rate of interest. Besides, investment elasticity to the interest rate is empirically weak: monetary policy has little impact on Y (see European Central Bank, 2010). Furthermore, during the financial crisis the interest rate channel was impaired with the collapse of the perfect market hypothesis.

The wealth effect channels consider the monetary policy impact on stock market prices for households (consumption-wealth channel) and firms (Tobin's Q channel).

For the consumption-wealth channel developed by Modigliani (1971), monetary policy transmits to the economy through the interest rate effects on households' wealth. A monetary policy rate (i) hike makes bonds more attractive owing to their higher remuneration, and consequently stock prices (P_s) decrease, because they are less attractive. Stocks being households' financial wealth (W) major component, monetary policy reduces W . Because their lifetime resources are lower, households dampen their consumption (C). This channel can be represented by the following sequence:

$$\downarrow M \Rightarrow \uparrow i \Rightarrow \downarrow P_s \Rightarrow \downarrow W \Rightarrow \downarrow C \Rightarrow \downarrow Y$$

This channel also applies to real estate as a component of households' wealth. An accommodative monetary policy could raise real-estate prices (P_s) and *in fine* be one of the causes of the housing bubble at the origin of the crisis that burst in 2008 (Eickmeier and Hofmann, 2013). The empirical importance of the households' wealth channel, however, is controversial (see Ludvigson et al., 2002; Mishkin, 2007).

With regard to the firms' wealth channel, monetary policy transmits to the economy, as stressed by Tobin's Q ratio, via the prices of firms' stocks (P_s). A restrictive monetary policy reduces P_s and the Q ratio: firms issue stocks at low prices relative to the cost of investment. Since firms can buy only a few investment goods with the stocks they issue, they find capital expensive and contract their investment spending. This channel works as follows:

$$\downarrow M \Rightarrow \uparrow i \Rightarrow \downarrow P_s \Rightarrow \downarrow Q \Rightarrow \downarrow I \Rightarrow \downarrow Y$$

The exchange-rate channel is significant owing to flexible exchange rates since the end of the Bretton Woods regime in 1973. An increase in domestic monetary policy interest rates makes assets, deposits and investments denominated in domestic currency more lucrative compared to investments in foreign currencies. It results in a rise in investments in domestic currency, leading to an increase in the demand for domestic currency: its exchange rate (E) appreciates. This appreciation deteriorates the price competitiveness of domestic goods, generating a contraction of net exports (X) and *in fine* of domestic output (Y). This channel can be summarized as follows:

$$\downarrow M \Rightarrow \uparrow i \Rightarrow \uparrow E \Rightarrow \downarrow X \Rightarrow \downarrow Y$$

This channel can impact not only on output, but also on inflation via a price effect. An exchange-rate appreciation reduces import prices denominated in domestic currency, causing "imported deflation". Conversely, an accommodative monetary policy leads to "imported inflation". Until recently this channel was more stressed by emerging than industrial countries' central banks. The European Central Bank does not emphasize

this channel, despite its aversion to imported inflation and the empirical significance of this channel (Boivin et al., 2009). During the global financial crisis that erupted in 2008, this channel gained interest in industrial countries, because other channels were impaired. For instance, the US Federal Reserve was suspected of depreciating the US dollar to boost the US economy and thus escape from the crisis, causing a so-called “currency war”.

Among neoclassical channels, central banks usually insist on the interest-rate channel. Yet their relative importance varies, depending on the monetary policy strategy, the types of (emerging or advanced) economies, and the (financing) structure or state of the economy. During the Great Recession, the interest-rate channel was impaired, other neo-classical channels were less in the shadows, and non-neoclassical channels were revived with the comeback of the “credit view” channels.

EMMANUEL CARRÉ

See also:

Asymmetric information; Bank deposits; Bretton Woods regime; Effective lower bound; European Central Bank; Federal Reserve System; Financial crisis; Housing bubble; Monetary policy instruments; Open-market operations; Reserve requirements.

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Monetary policy transmission channels – post-Keynesian

The transmission channels of monetary policy are the ways through which the central bank affects the economic system under its jurisdiction. This widely accepted definition leads to three questions. What are the instruments under the control of the central bank? What are the transmission channels of monetary policy? What are the goals of monetary policy and the side effects of central bank decisions?

Post-Keynesian authors discard barter economies and focus on monetary economies of production, considered as a process ruled by the principle of effective demand, where money plays a central role. Money is viewed as endogenously created by banks when they grant credit to creditworthy borrowers. The central bank manages the provision of

reserves to banks in a defensive way, in order to keep the interest rate at the targeted level (see Lavoie, 2011).

Through the management of expectations, the central bank can affect the term structure of interest rates, and also asset prices and the exchange rate. Longer-term real interest rates are a relevant variable for investment: they are the link that connects the central bank with the rest of the economic system, through investment demand. The interest rate plays at least three roles: (i) it is the price of the most liquid asset, namely bank deposits; (ii) it is a (re-)distributive variable as it provides income to financial *rentiers*; and (iii) it is a cost to producers who have to borrow to fund a production process. Post-Keynesians give more prominence to the influence of the interest rate on output through total demand, which may fluctuate owing to changes in income distribution.

Post-Keynesians assume that under normal circumstances banks lend to creditworthy borrowers at an interest rate determined by a fixed markup on the official interest rate set by the central bank, creating money *ex-nihilo*. With endogenous money, the impacts of short-term interest rates on the economy are as follows (see also Hannsgen, 2004):

- (1) Short-term interest rates affect longer-term interest rates and, for any given expectation on future inflation, real interest rates. The latter affect investment decisions through at least two channels: (a) the net present value of future expected proceeds increases when the interest rate (the discount factor) falls; and (b) firms will face an increasing demand if their clients have access to more funding. In this case, these firms will borrow to adjust productive capacity to expected future demand. It should be noted that point (a) above is subject to criticism, because expected proceeds are uncertain in a fundamental, Keynesian sense.
- (2) Changes in official interest rates may affect the financial account and this may lead to changes in the exchange rate, which, in turn, affect the trade balance. The latter, which is a component of aggregate demand, may change the level of output and employment and, indirectly, the inflation rate. Also, capital inflows may stimulate bank lending, if financial markets are flooded with additional money. Further, changes in the exchange rate directly alter the price of imports and, therefore, the level of domestic prices.
- (3) Asset prices, ruled by the present value of the stream of future proceeds, will change if the discount rate, given by the interest rate, changes. This may lead to changes in aggregate demand because of wealth effects and changes in the collateral held by borrowers.
- (4) When firms borrow to fund an investment project, they have to deal with debt service payments during a period of time, until the whole debt is paid back. This is viewed as a cost, similar to wage payments or energy costs. If firms aim to keep their profits stable, they shift interest-rate increases to final prices.
- (5) Higher interest rates mean a distributive change, increasing proceeds for savers who usually show a lower propensity to spend and, therefore, a weaker total demand.

Although post-Keynesians focus on the influence of interest rates on the demand side of the economy, they do not ignore the influence of this variable on the supply of credit (see Rochon, 1999, ch. 8). Accordingly, a lower interest rate leads to a higher value of assets held by banks and, thus, to a higher value of bank capital. This means that every single

bank will be able to respond to more credit demand, because its capital adequacy ratio rises. This balance-sheet channel also affects borrowers, who can offer larger collateral. Also, if the price of assets rises, the value of collateral used by banks in refinancing operations rises, making it easier for banks to get funds in the interbank market. Further, when the interest rate is low, an inverse adverse selection problem arises (Stiglitz and Weiss, 1984): banks ease their credit requirements as borrowers are more likely to be able to pay back debts to banks and because riskier assets are more attractive.

However, this credit-supply channel does not play an essential role for post-Keynesians, because they assume that banks can grant credit by creating money *ex-nihilo*, when they move forward in step. This means that bank capital and bank collateral are irrelevant in the process of endogenous money creation, when all banks share an optimistic view of the economic system. Furthermore, lower official interest rates may be useless, because when they are needed, notably during a recession, longer-term rates may not follow short-term rates if liquidity preference rises (bond holders try to get rid of their bonds at fire-sale prices), and if the interbank market collapses owing to a lack of confidence in liquidity and/or solvency amongst participating banks.

As regards monetary policy goals, post-Keynesians argue that the central bank should pursue full employment before aiming at price stability. Changes in total demand may unleash inflationary processes, so both these objectives may interact. Their favourite policy to bring an economic system close to full employment is fiscal policy, and they usually agree that the interest rate should be kept at a low and stable level. The reason for this is threefold: (i) during a recession, when the economy requires a low interest rate, agents may increase their liquidity preference: they try to get rid of their financial assets, which in turn increases their supply, making their prices fall and their yield rise (Chick and Dow, 2002; Arestis and Sawyer, 2004, 2006); (ii) a generalized perception of volatile interest rates may unleash bubbles of financial assets when speculators find a possibility of a capital gain borrowing short from banks in order to fund the purchase of financial assets; and (iii) current investment decisions depend on expectations on proceeds in the long run: firms prefer a stable interest rate (a convention) rather than a changing rate, because it reduces uncertainty about the flow of net future proceeds, mostly when investment projects are funded with borrowing.

ELADIO FEBRERO AND JORGE UXÓ

See also:

Asset price inflation; Bank deposits; Bubble; Endogenous money; Interest rates term structure; Monetary policy and income distribution; Monetary policy instruments; Policy rates of interest.

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Monetary targeting

In the 1970s, in response to mounting inflation concerns, several industrialized countries, such as the United States, Canada, the United Kingdom, Germany and Switzerland adopted monetary targeting. This monetary policy strategy follows Friedman (1959), who advocated a non-reactive k -percent rule for money-supply growth; that is, a constant percentage rate every year. Owing to long and variable lags between setting the monetary policy instrument and it having effects on macroeconomic variables, intentionally countercyclical monetary policy would have a destabilizing impact, instead of minimizing output variations. Friedman believed that such a rule would prevent major monetary policy errors, such as when the US Federal Reserve permitted the domestic money supply to collapse in the 1930s.

A money supply target, unlike inflation targeting, is not a final target rule, but an intermediate targeting rule. The rationale of intermediate targeting hinges on imperfect controllability of inflation and the long and variable lags of monetary policy. The central bank varies the interest rate (or central bank money) in order to reach the final target via the impact such moves have on monetary aggregates. Whereas the implementation of inflation targeting requires detailed knowledge about the transmission mechanism and models forecasting inflation, in this respect monetary targeting is less demanding: the range or point target of a monetary aggregate is derived from the quantity equation. In the long run, the average rate of inflation is equal to the average growth of the relevant monetary aggregate minus the average growth of output plus changes in the velocity of circulation of money. In order to set a target for monetary aggregates that is consistent with price stability, central banks only need to have estimates of trend or potential output growth and of prospective velocity growth, as well as an implicit inflation target (that is, the unavoidable or desired inflation rate that is compatible with the definition of price stability). The central bank reacts to deviations of growth in the relevant monetary aggregate from the target variable that is consistent with price stability.

A consensus view among mainstream economists maintains that a monetary policy rule is considered optimal if it helps minimize a loss function, formulated by the public in terms of legislation, which mostly applies to deviations of output (or unemployment) and inflation from their target levels. The specific weights assigned to the variables in the loss function vary from country to country.

Implicitly, with monetary targeting, little or no weight is attached to output stabilization. The optimality of a monetary policy rule hinges, according to the monetarist view, on at least three prerequisites, namely the stability and controllability of money demand, and a stable link between growth in the targeted monetary aggregate and inflation. Regarding the first of these, for money supply targeting to be appropriate, the short- and long-run money demand functions must be stable. The quantity of money should

predictably be related to a small set of key variables, such as the interest rate and output, which link money to the real sector of the economy. Instability of money demand functions has become an often-observed phenomenon in many countries, in particular after the 1980s in the process of financial innovation and deregulation, which has affected both the interest elasticity of different monetary aggregates and the balances held at each level of interest. In light of the erratic velocity of money, the monetarist assumption of a stable money demand was called into question. The declining role of the monetary targeting strategy was enforced by the marked differentiation of financial instruments and the corresponding difficulty in defining the money stock in statistical terms.

Regarding the second prerequisite, a central bank can only control the money stock if it is capable of controlling the variables determining money demand. The crucial issue is whether the different transmission channels that are at work are strong enough to ensure an overall negative effect of an interest rate increase on monetary aggregates. Controllability could be impaired for various reasons. The substitution effect may become positive: if the money stock contains interest-bearing components, money demand will *ceteris paribus* respond positively to a rise in the central bank's interest rate. Furthermore, if monetary policy affects the term structure of interest rates via inflationary expectations, an interest-rate increase might reduce long-term nominal interest rates and increase money demand.

A third prerequisite for monetary targeting to be successful is that monetary aggregates be a reliable leading indicator predicting future inflation rates. The empirical evidence of a direct relation between money-supply growth and inflation could – if at all – be observed in the aftermath of periods of extensively fast-growing money supply. Third, a central bank can only control the money stock if it is capable of controlling the variables determining money demand. The crucial issue is whether the different transmission channels that are at work are strong enough to ensure an overall negative effect of an interest rate increase on monetary aggregates. Controllability could be impaired for various reasons. The substitution effect may become positive: if the money stock contains interest-bearing components, money demand will *ceteris paribus* respond positively to a rise in the central bank's interest rate. Furthermore, if monetary policy affects the term structure of interest rates via inflationary expectations, an interest-rate increase might reduce long-term nominal interest rates and increase money demand.

The efficacy of monetarist prescriptions recommending targeting monetary aggregates and in particular controllability of money supply by central banks was early on challenged by the post-Keynesian approach. Post-Keynesian economists maintain that money is endogenously determined. Deposits with banks are created once loans are credited to borrowers' accounts. While the endogeneity of money is a feature common to distinct approaches to economic theory, the contribution of post-Keynesian monetary theory is the construction of endogenous money in terms of bank lending. Hence fluctuations in monetary aggregates are driven endogenously, either through the willingness of the central bank to accommodate increased demand for reserves at an unchanged interest rate or via the process of endogenous lending of financial institutions irrespective of a monetary policy impulse by the central bank (Palley, 2013).

As the prerequisites for a successful monetary targeting strategy had been far from fulfilled empirically, starting in the early 1990s many central banks in countries such as Canada, New Zealand, the United Kingdom and Sweden adopted some form of inflation

targeting as a framework for monetary policy. But even the Deutsche Bundesbank, which from the end of 1974 until Germany's joining of the European monetary union in 1999 had officially been following a monetary targeting strategy, frequently missed its intermediate money growth target. Rather, the monetary policy strategy of the Deutsche Bundesbank exhibited some features of inflation targeting (Bernanke and Mihov, 1997).

HELENE SCHUBERTH

See also:

Central bank money; Deutsche Bundesbank; Endogenous money; Financial innovation; Friedman rule; Inflation targeting; Monetarism; Monetary aggregates; Monetary policy transmission channels; Money supply; Price-level targeting; Quantity theory of money; Rules versus discretion.

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Monetary theory of distribution

The monetary theory of distribution was developed within the analytical setting of the classical surplus approach. It is based on a Keynesian–Sraffian view of the rate of interest as a policy-determined variable; that is, a conventional monetary phenomenon, determined from outside the system of production (Keynes, 1937; Sraffa, 1960, p. 33).

Given the necessary long-run connection between profits and interest, the monetary theory of distribution views the rate of interest as governing the course of profits. The actual mechanism whereby the rate of interest is seen as likely to "set the pace" in its connection with normal profit can be understood by thinking of the policy-determined long-term interest rate (the rate of interest to be earned on long-term riskless financial assets) as an autonomous determinant of normal money production costs, governing the ratio of prices to money wages. This interpretation of interest does not require any particular assumption as to the kind of capital employed in production (borrowed, shared or a firm's own capital). For any given situation of technique, a persistent change in the long-term rate of interest causes a change in the same direction in the level of prices in relation to the level of money wages, thereby generating a corresponding change in the rate of profits and an inverse change in the real wage.

Wage bargaining and monetary policy come out of this view as the main channels through which class relations act in determining distribution: they are seen as tending to act primarily upon the profit rate, via the policy-determined rate of interest, rather than upon the real wage as maintained by both classical economists and Marx. The level of the real wage prevailing in any given situation is regarded as the final result of the whole process by which distribution of income between workers and capitalists actually occurs.

Interest-rate determination is not subject to any general law, since interest-rate policy decisions are taken under a wide range of policy objectives and constraints, which have

different weights both among the various countries and for a particular country at different times, and with which, to a very large extent, the parties' relative strength is ultimately intertwined. Thus interest may indeed be regarded as a constrained policy variable, though not in the sense that interest-rate policy is constrained by a somehow pre-determined "natural" rate of interest or normal profitability of capital (Pivetti, 1991).

To acknowledge that the real wage is the residual variable in the relation between profits and wages is not to concede that the real wage may fall to any level whatsoever. In fact, owing to its "cost" or "necessary" component (Pivetti, 1999), the level of the real wage constitutes, in any case, an important constraint on the freedom of monetary policy to establish the level of interest rates. Imagine a situation in which the price-level/money-wage ratio keeps on being pushed up in the economy by an increasingly widespread presence of monopoly elements and by other social or technical factors. Then beyond certain limits, which will be different in each concrete situation, a compensatory effect will have to be sought in the level of interest rates.

The likely presence in actual fact of a real-wage constraint on monetary policy may be readily grasped by special reference to the US case, characterized since the early 1990s by rapidly rising profits of enterprise (business profits) in an expanding financial services industry, as well as by overly generous remunerations for top management and rising depreciation expenses per unit of capital. The normal price of output equals wage costs plus interests and normal profits of enterprise on the capital employed in production, plus an amount equal to the capital used up or destroyed in the production process, plus top-management compensation. One can thus write the following equations for value added per unit of labour (1) and for the gross profit margin (2), the latter being defined as the ratio of value added per unit of labour to the money wage rate:

$$p \cdot a = w + k(i + r_e + d) + m_r \quad (1)$$

$$\frac{p \cdot a}{w} = 1 + \frac{k(i + r_e + d) + m_r}{w} \quad (2)$$

where p is the unit price of output (a composite good representative of the gross output of a closed economy), a is output per unit of labour, w is the money wage rate, k is capital per unit of labour, i is the rate of interest (the pure remuneration per unit of capital), r_e is profit of enterprise per unit of capital, and d is depreciation per unit of capital. In equation (2) the gross profit margin includes, besides the gross remuneration of capital ($i + d$) and profit of enterprise, also top-management compensation – a magnitude assumed to be given in absolute terms, independently of the amount of capital employed in production. Now, given w and a , by lowering the policy-controlled variable i , it is possible to reduce ki , thereby checking the rise in $\frac{p \cdot a}{w}$ and the consequent fall of the real wage due to increasing values of d , r_e and m_r (Pivetti, 2013).

The monetary theory of distribution leads to a view of the role of monetary policy in the determination of inflation rates and activity levels that is very different from the commonly-received approach. As to inflation, the notion of the rate of interest as an autonomous determinant of normal prices implies that a higher policy rate of interest is by itself inflationary, through its direct impact on firms' markups. As to activity levels, interest-rate policy is bound to affect them through income distribution, alongside other

channels by which lasting changes in interest rates are bound to affect aggregate demand through consumption and net exports. An important implication of this theory thus concerns the status of the central bank: if interest-rate decisions, owing to their significance for the behaviour of the real economy, are a crucial component of general economic policy, then endowing the central bank with a politically independent power of decision on interest rates will be an ill-advised course of policy action, no less than any deliberate step towards losing control of the level of the domestic rate of interest (Pivetti, 1996).

MASSIMO PIVETTI

See also:

Interest rates setting; Monetary policy and income distribution; Natural rate of interest.

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Money and credit

The standard textbook theory of money usually begins with a story about an imaginary barter economy. The commodity that, owing to its physical features, avoids the need of the double coincidence of wants becomes the medium of exchange – that is, money. Credit then develops out of the need to allocate savings. This is the fundamental story that one finds at the core of some well-established theories, such as the loanable funds theory, the quantity theory of money, and the neutral role of money in general.

The loanable funds theory is based on the idea that the rate of interest adjusts until the supply of savings is equal to the demand for investment, as prices in any market would do. Banks are mere financial intermediaries bringing savers and investors together. The quantity theory of money asserts that changes in the quantity of money in the economic system are primarily responsible for changes in nominal gross domestic product, but do not affect real variables. Both theories are based on the concept that money is merely a lubricant, allowing for a better functioning of the economy. In this framework, money does not play any significant role in explaining real phenomena. This means that money is neutral.

The standard textbook uses coined money as an example to show the historical emergence of money. Coins are the perfect example of commodity money that eases exchanges in an otherwise barter economy. Indeed, when no bills and coins are available, other commodities are used as money: cigarettes in prison and war camps for example.

Yet, there is little empirical evidence to support the story of money emerging out of a barter economy. On the contrary, there is plenty of evidence that credit and money appeared at the same time (Graeber, 2011). The first example of credit relationships lies in clay tablets in Babylon and tally sticks in Europe, suggesting that “banking precedes coined money by a few thousands of years” (Ryan-Collins et al., 2012, p. 34).

From a theoretical point of view, some critiques emerge as well. The most obvious is that the neoclassical theory of money is internally inconsistent (*ibid.*). In a world of perfect information, there is no need for commodity money to provide information about the value of goods and services.

Many economists explained that credit creation precedes the production process (see Marx, 1867 [1976]; Keynes, 1936; Schumpeter, 1954 [1994], among others), rather than being superimposed on the production process to lubricate exchanges. Credit demand is thus determined by production, investment in capital goods, or innovation activities.

Finally, Keynes (1936) insisted that the reasons to hoard money are more complex than the simple demand function proposed by the mainstream story. Uncertainty, trust, and liquidity preference play a role in determining savings and credit demand.

This seems to indicate that money was added to the neoclassical theory and that its roles and functions were deducted from that framework (some authors did not even bother to add money; for example, Walras’s auctioneer allows him to ignore it). Within the orthodox framework, money is a commodity like any other and as such is regulated by the laws of supply and demand. There is even a production function attached to it. This deductive approach to money pays no attention to the nature of money and credit, and to the role of money as a social relation. This highlights the necessity to develop a theory of money using an inductive approach based on empirical facts. Indeed, for some economists, “it is impossible to study economics, in particular macroeconomics, without first understanding the conception of money, its logical origin and creation, and how money is linked to production and income” (Rochon and Rossi, 2013, p. 211).

The theory of endogenous money rests on Marxist and circuitist writings, and has been further developed by Keynes and post-Keynesian economists. It is based on the simple idea that “loans make deposits” (see Moore, 1988; Wray, 1990; Lavoie, 1992; Rochon and Vernengo, 2001; Graziani, 2003). This theory inverts the causality explained by the loanable funds theory, shows that the quantity theory of money is flawed, and disproves the neutral role of money in general.

In a nutshell, the theory of endogenous money has credit-money being created by banks when loans are granted, and money being destroyed when these loans are repaid. In this framework, banks are therefore not simply intermediaries. Furthermore, central banks do not control “the quantity of loans and deposits in the economy by controlling the quantity of central bank money. [. . .] Rather [. . .], central banks today typically implement monetary policy by setting [. . .] interest rates” (McLeay et al., 2014, p. 2).

ANTOINE GODIN

See also:

Bank money; Commodity money; Credit creation; Endogenous money; Interest rates setting; Monetary circuit; Money creation; Money creation and economic growth; Money neutrality; Money supply; Quantity theory of credit; Quantity theory of money.

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Money creation

According to Hawtrey (1919), money, like a teaspoon or an umbrella, can only be defined by its use. In order to explain how a teaspoon is created, however, one must know if it is made of metal or plastic. It is the same for money: money supported by metal is not created in the same way as money supported by credit. In a sense, we could argue that metal money is created by nature, as nature provides the metal. The ore extraction is an industrial process and, in such a monetary regime, everyone may ask for the conversion of metal into coins. This conversion, or coinage, is a mere administrative process.

The creation of credit-money, however, is completely different. Mainstream economists neglect its study. Most economists are conscious that banks create credit-money. For instance, the fact that Friedman (1959) wanted to forbid the creation of money by commercial banks implies that he knew very well that they created money. This did not prevent him, however, from writing that everything occurs as if money were dropped from a helicopter (Friedman, 1969). Thus he considered useless the study of how credit-money is created.

Post-Keynesians, however, disagree: in a monetary circuit, the creation of money is the first stage, and precedes the stages of production and the payment of incomes. Credit-money is created *ex-nihilo*; that is to say, no raw materials are needed in that regard. In most situations, it comes from an exchange of two debts: one is an ordinary debt, that is, a debt from a non-bank agent (firm, household or government) toward a bank (recorded as a loan in an asset account), and the other is a bank debt, that is, a debt from a bank (recorded in a liability account) to the non-bank agent. This last debt is money. Both debts are recorded simultaneously in the same operation under the principle of double-entry bookkeeping. Hence, one cannot maintain that deposits make loans (the liability account being in general a deposit account), because deposits do not pre-exist loans. As a matter of fact, loans make deposits.

A bank deposit is money, because it is used for every kind of payment, such as the payment of wages, the purchase of goods, loans from a non-bank agent to another

non-bank agent, and so on. Hence, each payment is a transfer of bank money from a depositor to another one. The legal support of bank debt may take any form: it may be written on a banknote or it may only be scriptural; the only thing that matters is that the bank debt must be liquid – that is, it has no term and may be transferred immediately to any agent, in the form of a bank debt to that agent. Banks are very ingenious and are always inventing new techniques (from the bill of exchange to the debit card) for facilitating transfers. They have also invented “near money”; that is, debts that are not payable on demand, but which may be converted rapidly into demand accounts.

However, a perfect credit-money system implies that one can distinguish bank debts from ordinary debts, and that any bank customer may transfer his deposit to the bank of any of his creditors. Hence, it is necessary that there is an authority that says which institution is a bank and which is not, and that the banks so defined form a system.

Despite this claim, at the origin of banks there was no authority: it happened that when legal money was metal, some people lent more than they had. Some of them succeeded – that is, created credits *ex-nihilo* that have been effectively used as money in circulating from banks to banks – but other failed, to wit, have not been able to satisfy all the demand of conversion of their debt to metal. In this system, credit-money is not true money, as it remains possible that its creator fails and disappears.

Nowadays, in developed economies, nearly all people have a bank account and it is inconceivable that credit-money is not true money. Therefore, deposits insurance has been instituted, which warrants that any depositor in any bank can always transfer his deposit to any other bank. The counterpart of this insurance, however, is an *a priori* control of the allocation of credit. This is plainly justified: banks have the privilege to create money, a privilege coming from the license granted by the State. To avoid inflation and bubbles, however, the State should make sure that each quantum of money created and paid as an income corresponds to a production. But once money is created, it must circulate freely. That justifies a strong separation between deposit banks creating money and being strongly controlled, and simple financial intermediaries that participate to the free circulation of money already created.

BERNARD VALLAGEAS

See also:

Bank money; Commodity money; Credit creation; Endogenous money; Monetary circuit; Money and credit; Money creation and economic growth; Money supply; Narrow banking; Quantity theory of credit.

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Money creation and economic growth

Neoclassical growth theory abstracts from important institutional features of modern capitalist economies. The most important characteristic concerns the ability of banks to

issue additional money by credit expansion. This essential feature of modern capitalist economies was emphasized by Keynes and Schumpeter. They both came to the conclusion that modern capitalist economies cannot be described in the same way as traditional economies, where credit money did not exist yet. Keynes (1933 [1973a]; 1933 [1973b]) distinguished between “real exchange economies”, where money is just used as an instrument that facilitates the exchange of goods and services, and “monetary economies”, where banks possess the ability to increase the money supply by credit expansion. Schumpeter (1934) made a similar distinction between “pure exchange economies” and “capitalist economies”.

Both economists also recognized that economic growth would not be possible without banks and their ability to increase the supply of money. Keynes (1937, p. 667) argued that “banks hold the key position in the transition from a lower to a higher scale of activity”. Schumpeter (1927, p. 86, my translation) explained that “[w]ithout the creation of new purchasing power by bank credits [. . .] financing of industrial development in modern economies would have been impossible”. Therefore one can conclude that “in a monetary economy of production, credit is needed to enable firms to continue and expand production. There is a definitive link between bank credit and economic growth” (Rochon and Rossi, 2004, p. 146).

Keynes and Schumpeter also stressed the fact that an increase in investment spending cannot be financed by previous saving, if the economy is supposed to grow (Binswanger, 1996). Whenever saving increases, it reduces consumption by the same amount. Therefore, if more investment is financed by additional saving, the increase in demand by investment spending is offset by a corresponding decrease in consumption spending. “Financing investment by additional saving is a zero-sum game, which only reallocates financial resources” (Chick, 2000, p. 133). Of course, in an open economy, an increase in investment can also be financed by an inflow of foreign savings. In this case, there is no corresponding decrease in domestic consumption spending. But there will be a corresponding lack of funds in the countries where these savings have been formed. All countries together (the world economy) can only expand if additional funds are provided by money creation of banks.

Therefore, savings cannot be the ultimate source of finance for economic growth. According to Keynes (1939, p. 572), investment determines saving and not the other way around: “Credit expansion provides not an alternative to increased saving but a necessary preparation for it. It is the parent, not the twin of increased saving”. This view is radically different from neoclassical growth theory, where investment is determined by saving, and where credit expansion has no role to play.

In fact, not many economists after Keynes and Schumpeter (not even Keynesians or Schumpeterians) paid attention to the role of money and credit in the process of economic growth, although this role features prominently in Keynes’s and Schumpeter’s work. Only one leading exponent of growth theory, Domar (1957, p. 92), recognized the importance of money creation, when he wrote that “[i]t is not sufficient [. . .] that savings of yesterday be invested today, or, as it is often expressed, that investment offsets savings. Investment today must always exceed the savings of yesterday. [. . .] An injection of new money [. . .] must take place every day”. But in spite of this remark, Domar did not further investigate the link between money creation and economic growth. Generally, mainstream economic theory has continued to neglect this important relation: money creation and economic

growth have thus been treated as two totally different phenomena, as economic growth (in the long run) is not supposed to be influenced by monetary variables.

Now, in light of the close link between money creation and financing investment, it is obvious that continuous economic growth was only possible after modern banks had already evolved. Indeed, the financial revolution preceded the industrial revolution (see Ferguson, 2008): modern banking originated in London in the seventeenth century, when some goldsmiths discovered the possibility of money creation by granting loans in the form of goldsmith notes, which were not fully backed by gold any more (Quinn, 1997). Therefore, the receiver of a loan could spend more money (in the form of goldsmith notes) without having to wait for a saver to deposit money (in the form of gold) first. These goldsmiths paved the way for the modern banking system, where bank loans provide the necessary funds for constantly financing more investment in real capital (machines, equipment), which enables the production of more goods and, therefore, real economic growth. Since an increase in bank loans causes a corresponding increase in bank deposits (loans make deposits), modern economies are characterized by a constantly growing money supply along with a constantly growing real GDP (abstracting from business cycle fluctuations).

MATHIAS BINSWANGER

See also:

100% money; Bank money; Chicago Plan; Credit creation; Endogenous money; Monetary circuit; Money supply; Quantity theory of credit.

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Money doctors

The term “money doctors” is used to describe foreigners who advise national governments on domestic monetary and financial reforms (see Drake, 1994; Flandreau, 2003). Money doctors have been an important feature of the international financial landscape over the twentieth century. They have also played an important role in the history of central banking, often by providing blueprints for the creation – or reform – of central banks in poorer countries.

Some money doctors have been private individuals hired by foreign governments. The most famous of these was Princeton economics professor Edwin Kemmerer during the 1920s (see Drake, 1989; Eichengreen, 1994; Rosenberg, 1999). He had begun his financial advisory career working for the US colonial administration in the Philippines in the early twentieth century. After the First World War, he became a freelance advisor employed by various Latin American governments to help establish central banks as well as by other governments – ranging from South Africa to Poland – seeking advice on various kinds of monetary reforms.

Money doctors have also often been officials from dominant financial powers. Following in Kemmerer’s footsteps, employees of the US Federal Reserve – led by Robert Triffin – advised various governments across Latin America and Asia to create central banks during the 1940s (see Alacevich and Asso, 2009; Helleiner, 2009). In the late nineteenth and early twentieth century, Japanese officials such as Gotō Shinpei and Megata Tanetarō played a key role in the establishment of new central banks in Taiwan and Korea after these two jurisdictions had been annexed by Japan (see Schiltz, 2012). Various Bank of England officials also played important financial advisory roles to foreign governments within Britain’s sphere of influence during the inter-war and early post-war years (see Helleiner, 2003).

Other money doctors have been officials of multilateral institutions. During the inter-war period, economists from the League of Nations assisted with monetary reforms and the establishment of new central banks in a number of central and east European countries (see Pauly, 1998; Helleiner, 2003; Schuker, 2003). In the post-1945 years, officials of the International Monetary Fund assumed increasingly influential financial advisory roles *vis-à-vis* member countries, particularly during and after the international debt crisis of the 1980s (see Pauly, 2003; Woods, 2007).

These various money doctors often saw themselves as experts offering objective scientific advice. They usually became embroiled, however, in international and local politics in various ways. Kemmerer’s private missions during the 1920s were often tacitly supported by the US government, and they were used by politicians in the receiving countries to achieve domestic political goals. Official money-doctoring missions from dominant financial powers were almost always linked to political and strategic objectives of the home government. The financial advice offered by League and IMF officials was also influenced by politics within these institutions and it often generated intense political controversies in receiving countries.

Like medical doctors, money doctors have not always agreed on their diagnoses. Both Kemmerer and the League of Nations financial missions were well known for their advocacy of “sound” money and the gold standard. But US Federal Reserve officials in the 1940s explicitly challenged that neoclassical monetary orthodoxy, stressing the need

for more activist policies. Before World War II, Japanese money doctors were also more inclined than their US and European counterparts to back “easy money” policies that would support “developmentalist” goals in contexts such as their Korean colony (Schiltz, 2012, pp. 111, 115). The nature of IMF advice has also changed in a number of ways over the post-war period. This variation in the content of money-doctoring across space and time provides another reason to question the scientific pretensions of some of its practitioners.

ERIC HELLEINER

See also:

International Monetary Fund; Kemmerer, Edwin Walter; Triffin, Robert.

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Money illusion

According to mainstream theory, economic agents suffer from money illusion (a term attributed to Fisher, 1928, ch. 1) when, owing to an equiproportionate change in the quantity of money and in all monetary prices (a condition which implies invariance of relative prices and of real wealth possessed), they perceive this change as bringing about an increase in disposable income and fail to grasp that the purchasing power of their income has remained unchanged.

In this framework, however, agents who behave rationally cannot be affected by

money illusion, as they realize that changes in monetary variables do not modify real variables. The absence of money illusion was put forward, particularly in the 1930s and 1940s, by neoclassical economists (see Leontief, 1936–37; Modigliani, 1944), who used a mathematical rule to show the neutrality of money championed by traditional economic theory. This rule, which implied that real magnitudes were totally insensitive to changes on the money market, asserted that commodity demand equations are unable to include the general price level among their independent variables. Accordingly, such demand has a zero degree homogeneity with respect to the price level.

This gave rise to the so-called “homogeneity postulate”, which, by excessively simplifying the terms of the question (partly on the basis of Walras’s understanding of the money market), generated a clear-cut division between the real sector and the monetary sector of an economic system. Indeed, when he addressed the question of general equilibrium in the presence of fiat money, Walras (1900, leçon 30) stated that the influence exerted on the other markets by the price of the storage service (“*service d’approvisionnement*”) that he assigned to money was indirect and weak. Such a postulate, however, would not only lead to a situation of neutrality for the monetary variable, but would even result in the emergence of a dichotomy as regards the functioning of the economic system.

Effectively, advocates of the homogeneity postulate give an extremely restrictive interpretation of money illusion, claiming that it can be perceived when commodity demand functions are affected by the general price level. If this is the case, the absence of money illusion requires full independence between real and monetary magnitudes, even within a Walrasian general equilibrium framework, which by definition involves interdependence among all markets of the economic system.

The above-mentioned dichotomy contrasts with the existence of a monetary economy: money, which affects prices, would not influence real magnitudes (as their demand is independent of prices) and would thus be useless (serving only as a unit of account), since real-sector equilibrium would be compatible with any price level. Consequently, the homogeneity postulate actually reflects the functioning of a false monetary economy. This crucial aspect is described by Patinkin (1965, ch. 8) as a contradiction of classical monetary doctrine, which has been formalized by the quantity theory of money.

The absence of money illusion in the behaviour of rational and maximizing agents in a monetarily neutral economy is criticized by Keynesian authors, who challenge both its formal validity and its ability to capture the behaviour of economic agents.

With regard to the formal validity of the assumption that the absence of money illusion reflects the neutrality of money, it should be underlined that an economy without a bond market (thus including only commodity and money markets) requires, for the existence of this neutrality, that a modification of the quantity of fiat money should be achieved by varying the initial stock of money held by each agent in the same proportion. Only in this case would it be possible to avoid the distributive effects of such variation. This change, if not proportionally distributed among agents, would not be neutral in its consequences, because it would generate higher relative prices for the commodities preferred by those benefitting more from the increase of money balances, and lower relative prices for the commodities preferred by those experiencing a lower than average change in their balances. This outcome would then lead to a change in relative prices as well as in real wealth because of the modification of the monetary endowment of economic agents (Patinkin, 1965, ch. 3).

Introducing the bond market into the model induces further complications because, here too, variations in the money stock exert distributive effects. Thus, in order to maintain the neutrality of money, it is necessary to add the further hypothesis that the bonds held by each economic agent are modified at the same rate of variation as money. This involves cancelling what Patinkin (1965, ch. 4) calls the “real-indebtedness effect”, by indexing the value of the bonds held by agents. The absence of indexing would lead to distributive effects on the bond market, because of the real value’s reduction of existing bonds as a result of monetary expansion. Such reduction, in fact, would benefit the issuers (whose debts would be decreased) at the expense of purchasers (whose credits would be decreased). Consequently, the effects on the demand for commodities of these two categories of operators would be different.

The scholars examining the economic agents’ attitude towards these problems are becoming increasingly aware that, although the absence of money illusion is, at a theoretical level, consistent with the rational and maximizing behaviour of agents in a competitive economy, it tends to be contradicted by the agents themselves in everyday practice (particularly by those without a background in economics). Thus agents may oversimplify their assessment of economic events, believing that the real values of the observed variables coincide with the corresponding monetary values, as the latter are widespread throughout normal economic activity (Fehr and Tyran, 2001; Nolan, 2008). Accordingly, the variables in monetary terms are commonly viewed as a proxy of the corresponding real value. Furthermore, economic agents (particularly as regards labour and housing markets) are often reluctant to accept a nominal loss, even in the presence of a gain in real terms. This corroborates the assumption of downward rigidity of prices and wages.

GIUSEPPE MASTROMATTEO AND ADELMO TEDESCHI

See also:

Classical dichotomy; Monetarism; Money neutrality; Money supply; Quantity theory of money; Real-balance effect.

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Money multiplier

According to Humphrey (1993, p. 3),

[b]eginning students of banking must grapple with a curious paradox: the banking system can multiply deposits on a given base of reserves, but none of its member banks can [. . .]. Let the reserve-to-deposit ratio be [. . .] 20 percent [. . .] the system [. . .] by making loans, creates \$5 of

deposit money per dollar of reserves [. . .]. [But] [. . .] the individual bank receiving the same dollar [. . .] can lend out no more than 80 cents of it. How [. . .] [to] [. . .] reconcile the banking systems' ability to multiply loans and deposits with the individual bank's inability to do so?

The real paradox for mainstream banking theory, however, is not the difference between individual banks and the system as a whole, but the very idea that “loans make deposits” rather than “deposits make loans”; that is to say, that the money supply is endogenous (see Wray, 2012; Smithin, 2013). This is anathema to economists who accept the “loanable funds” theory of interest-rate determination. According to this theory, the “funds” to be lent must come from “savings”, and be deposited in a bank before they can be loaned out. Therefore, any concept of the multiple expansion of bank deposits causes dissonance.

Humphrey (1993) remarks that the notion of the “deposit multiplier” was largely accepted by the mainstream economics profession (after 100 years of development) by the mid 1920s. This was because it seemed to solve these puzzles in an acceptable way. The solution was to allow the idea of bank credit creation (in a limited sense) at the systemic level, but to pour scorn on anyone who suggested that individual banks also create credit and money. Individual banks supposedly only lent the “excess reserves” from sums previously deposited (at 80 cents on the dollar in the above example). However, when the 80 cents arrive at the next bank in line, this bank can also lend out a further 64 cents [$0.8 \times (80)$] and still claim to be lending only a fraction of deposits, and so on. The “limit” of the infinite series is $1/0.2 (= 5)$. It also seemed important to keep to the idea that there must be some original cash deposit to get the ball rolling. If, for instance, 100 US dollars are deposited with a bank in the first instance, the total money supply (the total of bank deposits) can expand in this case by 500 US dollars, but no more. It should go without saying (but still does not in money and banking textbooks) that the argument is a fallacy. The assumption of a fixed reserve–deposit ratio is entirely arbitrary. Moreover, whatever ratio the individual banks decide (on their own initiative) is prudent, they can always acquire the necessary reserves *ex-post* (after the loans are made), including by borrowing them from the central bank or on the interbank market.

The monetarists of the 1950s and 1960s were responsible for introducing the notion of the “money multiplier” (see Friedman, 1960; Goodhart, 1989). The main policy prescription of the monetarist school was for the central bank to control the rate of growth of the money supply. However, for this to be implemented, it had to be argued that there was a reliable connection between the growth rate of the central bank's own liabilities and the money supply itself. This was the purpose of the money multiplier, which was supposed to operate on the same principles as the bank deposit multiplier. By definition, the monetary base H (“high-powered money” for monetarists) is given by:

$$H = CU + R \quad (1)$$

where CU stands for currency in the hands of the non-bank public, and R for commercial bank reserves. If D is the symbol for bank deposits, the total money supply is therefore:

$$M = CU + D \quad (2)$$

With some manipulation the money multiplier comes out as follows:

$$M = [(1 + CU/D)/(CU/D + R/D)]H \quad (3)$$

This allows for a non-zero cash–deposit ratio ($CU/D > 0$), and makes clear that the monetary base consists of nothing other than the liabilities of the central bank. The idea is that if H changes by some given dollar amount, then the money supply itself will change in the ratio $(1 + CU/D)/(CU/D + R/D)$. Again, however, the argument does not work. In reality, all of H , M , CU/D and R/D (the reserve–deposit ratio) are endogenous variables.

In the real world, commercial banks “move forward in step” (Keynes, 1971, p. 23) not by restricting themselves to loaning out “other people’s money”, but by adjusting their own deposit and lending rates of interest when the central bank policy rate of interest changes (see Lavoie, 2010; Kam and Smithin, 2012). Let i_0 be the nominal policy interest rate of the central bank, and i_D and i_L the commercial bank deposit and lending rates of interest, respectively. The commercial bank deposit rate of interest is a “markdown” from the policy rate of interest (see Rogers and Rymes, 2000; Kam and Smithin, 2012):

$$i_D = \sigma i_0, 0 < \sigma < 1 \quad (4)$$

Thus, if m is the markup between commercial bank deposit and lending rates of interest, then:

$$i_L = \mu + \sigma i_0 \quad (5)$$

It is therefore reasonable to argue that the central bank can influence commercial bank lending rates of interest (and thereby the total of banks’ balance sheets) by changing the policy rate of interest, but not that there is any direct numerical relationship between H and M .

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See also:

Bank money; Endogenous money; Fractional reserve banking; Friedman rule; High-powered money; Monetarism; Monetary targeting; Money and credit; Money creation; Money supply; Reserve requirements.

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Money neutrality

The neutrality of money implies that money has no influence on produced output and on all relative prices and real magnitudes. Following the quantity theory of money, current orthodox economics holds that money is just an instrument to settle transactions and, therefore, unimportant, at least in the long run. In other words, money is a veil (Pigou, 1949) with no influence on the “real” economy.

In the basic orthodox macroeconomic framework, the “real” economy is represented by the following three-macro-market model:

- (1) the labour market, where the demand and supply functions depend on the real wage;
- (2) the capital market, where the demand and supply functions depend on the real interest rate; and
- (3) the goods market, where supply depends on the factors of production (labour and capital), and thereby on both the real wage and the real interest rate, while aggregate demand (consumption plus investment) depends on the real interest rate.

In this framework, competitive forces drive the real wage and the real interest rate, and (at least in the long run) the factor markets clear. Because of Walras’s law, the goods market clears as well. Given the competitive adjustment in the factor markets, aggregate demand adjusts to aggregate supply, regardless of the level of output reached by firms, using the equilibrium quantity of factors (Say’s law). As the supply and demand functions depend on relative (or real) prices (not on money prices *per se*), they do not depend on the quantity of money involved in payments. Hence, neither equilibrium quantities nor equilibrium relative prices involve money. The system works as a barter economy.

Money cannot be accounted for in this theory, except as a neutral device. This was achieved by introducing a fourth macro-market. The “Cambridge approach” advocated by Pigou (1949) assumes that the quantity of money is supplied by the banking system exogenously ($M^s = M$), while the demand for money obeys the transactions motive: $M^d = k P Q^*$, where P is the level of money prices, Q^* is the equilibrium level of output and M^d is the demand for money; k is a parameter expressing the proportion required to settle the equilibrium transactions in money: $M^d / (P Q^*)$. Since equilibrium real prices and quantities are determined in the first three markets, it follows that the money market determines the remaining endogenous variable of the system, which is the money price of goods. The equilibrium level of the money price results from the equilibrium condition $M^s = M^d$, which yields: $P^* = M / (k Q^*)$.

To address the case of an endogenous supply of money, current orthodox economic theory assumes that the central bank sets the short-term interest rate to control the long-term interest rate, and thereby the money price of goods (Woodford, 2003, p. 16). The

money market in this case determines endogenously the quantity of money as a function of the (controlled) money price level: $M^* = k P Q^*$. But regardless of whether the quantity of money is endogenous or exogenous in orthodox models, the money market only determines equilibrium money prices and the nominal value of aggregate quantities, not equilibrium relative prices and real aggregate quantities, so that money remains fundamentally neutral in this contemporary version of traditional monetary theory.

The neutrality of money has important implications with respect to monetary policy. Since money only influences money prices (including nominal wages and nominal interest rates), inflation is considered as a monetary phenomenon caused by inappropriate monetary policy (Friedman, 1963). In the exogenous money version, inflation develops when the supply of money M rises faster than $k Q^*$. Given the k parameter, $k Q^*$ varies if and when Q^* varies in accordance with the prevailing conditions in the “real” economy, so that a discrepancy between M and Q^* entails a proportional change in the price level of goods. If monetary authorities want to stabilize money prices (zero inflation), the rate of change of the money supply must be the same as the growth rate of real GDP (unless k varies because of some structural change in the way money is involved in payments). In the “endogenous money” version of this theory, inflation develops when the short-term interest rate set by monetary authorities is too low. This entails a proportional change in the money demand, hence in the money quantity, for Q^* is determined by the prevailing conditions in the “real” economy, at least in the long run. The relation between M and P is just reversed and there are no lasting real effects. To stabilize money prices, the central bank must adjust the short-term interest rate in the spirit of the “Taylor rule”.

Post-Keynesians reject the “axiom of money neutrality”, because in the real uncertain world insurance markets cannot offer a hedge against potential undesirable future outcomes of any economic decisions, especially in financial markets (Davidson, 2006, pp. 147–9). Hence, money is not a simple, neutral transaction device. Money matters because, unless the long-term interest rate offers a sufficient reward, economic agents would prefer higher money holdings (lower risky holdings) than predicted by the sole transactions motive (finance, speculative and precaution motives). This is the reason why the long-term equilibrium rate of interest departs from the orthodox “natural” (full employment) rate of interest.

Therefore, the post-Keynesian view on endogenous money and interest-rate policy radically departs from the neo-Wicksellian orthodox approach *à la* Woodford (Rochon, 2006): because of the real effects of money, interest rates policy is flawed if it is only aimed at controlling inflation as claimed in the orthodox approach to endogenous money. When the economy operates below full employment, a downward shift in the rate of interest increases both the demand for money (hence the money supply) and the equilibrium level of output, whereas in the orthodox view the level of output is independent (at least in the long run) of monetary variables. Furthermore, given the endogenous change in money supply caused by a decrease in the rate of interest, the more aggregate output is elastic, the less money prices change, which leads to a rejection of the orthodox view on the relation between money supply and nominal prices.

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See also:

Classical dichotomy; Endogenous money; Friedman rule; Inflation; Money illusion; Natural rate of interest; Quantity theory of money; Real-balance effect; Taylor rule; Wicksell, Knut.

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Money supply

The money supply refers to a set of related measures of the outstanding volume of liquid financial assets. While exact definitions vary from country to country, these assets are either the liabilities of the national central bank, such as notes, coins and settlement balances (referred to as "high-powered money"), or the liabilities of private banks, such as bank deposits of various maturities (grouped as "narrow money" and, including a wider range of assets, "broad money"). Central banks influence the money supply via a number of mechanisms such as setting the interest rates paid for borrowed settlement balances, and engaging in "open market operations" in which the central bank exchanges settlement balances for non-monetary financial assets held by third-party institutions. The use of such instruments with the intention of influencing variables such as inflation or unemployment rates is referred to as monetary policy.

How the money supply is determined is debated between adherents to the quantity theory of money, who argue that central banks control the money supply and that its growth rate determines the rate of inflation, and proponents of endogenous money, who argue that money is created mainly through commercial banks lending and thus varies "endogenously", without necessarily leading to changes in the price level. Monetarism, the modern version of the exogenous money view (Friedman, 1956), argues that in the long run the economy will always tend towards a "natural rate of unemployment". Any attempt to increase output and employment using expansionary monetary policies may affect real variables in the short run but will ultimately result only in an increase in the rate of inflation. Monetary policy should therefore target the growth rate of the money supply.

Proponents of endogenous money, in particular post-Keynesians, argue that commercial banks create money when they undertake new lending. The volume of broad money is thus determined through the interaction between the demand for credit and the lending decisions of banks (Kaldor, 1970; Moore, 1988). They argue that the monetary authority usually sets interest rates, and supplies settlement balances on banks' demand at these rates, such that the volume of high-powered money adjusts to accommodate the liquidity requirements of commercial banks. The quantity of money is therefore not a variable that is subject to direct control by the authorities. The rate of interest charged for borrowed settlement balances thus becomes the key instrument of monetary policy.

Moreover, since post-Keynesians reject the natural rate of unemployment, monetary policy may have real effects, even in the long run (Kriesler and Lavoie, 2007).

Monetarists posited a stable “money multiplier” relationship between high-powered money and broader monetary aggregates. As central banks tried to implement monetarist policies, these relations proved unstable (Goodhart, 1981). The 1980s saw a proliferation of money supply measures as the authorities unsuccessfully attempted to control the money supply using one measure after another. Consequently, most central banks moved from money supply targets to inflation targets. While price stability continued to be regarded as the main policy objective, central banks now considered the interest rate as their main policy tool. This policy shift was underpinned theoretically by the so-called New Consensus Macroeconomics (NCM): a neo-Wicksellian system in which inflationary impulses result from divergences between the natural and money rates of interest (Woodford, 2003). In such a system, price stability can best be maintained through the implementation of a Taylor Rule, such that the rate of interest responds automatically to movements in inflation rates and the “output gap” (defined as the disparity between actual and “potential” output).

While the policy instrument has changed, NCM maintains monetarist conclusions concerning activist monetary policy, employment and the price level. With this shift, the NCM implicitly accepts the post-Keynesian position on endogenous money, but continues to avoid the issue of privately created bank money. Proponents of the NCM claimed that inflation targeting was an important factor in the “long boom” starting from the mid 1980s, with inflation rates stabilizing at historically low levels and substantial declines in macroeconomic volatility (Bernanke, 2004). However, while consumer price inflation stabilized, asset prices became highly inflated and leverage increased enormously. The bubble burst in 2007 with the US subprime crisis, leading to the global financial crisis. Price stability had not given rise to financial stability.

While inflation targeting regimes still form the official framework for central banks, their suitability is increasingly questioned (see for instance Blanchard et al., 2010). Faced with near-zero nominal interest rates, a fragile banking sector and highly indebted households, central banks resorted to “unconventional” monetary policy measures. So-called “quantitative easing” entails using newly created central bank money to purchase financial assets on a large scale – the authorities effectively turned back to manipulating the monetary base. While these operations increased the volumes of central bank money several-fold, they did not overcome declining economic activity and the unwillingness of commercial banks to lend. As a result, volumes of credit – and thus broad money supply measures – continued to fall.

JO MICHELL AND ENGELBERT STOCKHAMMER

See also:

Bank deposits; Bank money; Bubble; Central bank money; Endogenous money; Fiat money; Financial crisis; Friedman rule; High-powered money; Inflation targeting; Interest rates setting; Monetarism; Monetary circuit; Monetary targeting; Money and credit; Money creation; Money creation and economic growth; Money illusion; Money multiplier; Money neutrality; Open-market operations; Output gap; Quantity theory of credit; Quantity theory of money; Settlement balances; Taylor rule; Zero interest-rate policy.

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N

Narrow banking

Narrow banking is an arrangement in which payment services and lending functions are separated and performed by two different sets of institutions. In contrast, under the current system of depository banking, one firm (a commercial bank) performs both services by making loans and accepting short-term deposits. These deposits are a source of liquidity for agents in the economy. Those who advocate narrow banking acknowledge that it is, in all probability, no accident that the two functions came to be performed by one entity. Banks exist, in a world of imperfect information, to gather this information and monitor borrowers (see Diamond, 1991). Individuals attempting to gather information and monitor debtors would find such activities costly, and would face the prospect of others free-riding on their efforts. Banks therefore act as “delegated monitors” and information specialists.

A problem, of course, is that the bank has greater knowledge of its investments than its investors, and the bank managers may not act in the interest of investors. It turns out, according to Calomiris and Kahn (1991), that financing bank activity with demandable debt (deposits) acts to obviate this problem. The ability of investors to demand debt immediately – and force the liquidation of the bank if they believe that the bankers have made poor lending decisions – aligns the incentives of bank managers with those of the investors (depositors). Moreover, there is also a demand for payment services, and demand deposits perform this role as well.

The main drawback of such an arrangement is that if depositors decide to withdraw their funds suddenly, the bank may be unable to honour its commitment to redeem deposits on demand. Suspension of convertibility or bankruptcy of the institutions can result. A difficulty with this problem of “runs”, or panics, is that, according to some observers, a particular bank may experience a run despite being fundamentally sound. News of problems at other banks, or unfounded rumours, can lead depositors to panic. The fact that banks are “illiquid”, in that short-term assets are much less than short-term liabilities, can lead to self-fulfilling runs (see Diamond and Dybvig, 1983).

To avoid the problem of financial instability caused by depository banking, governments worldwide have adopted systems of deposit insurance. In the United States, such legislation was passed in the wake of the Great Depression, a phenomenon in which many believed bank failures played a prominent role (see Bernanke, 1983). However, deposit insurance may lead to its own moral-hazard problems, in which bankers, insured against runs, seek the riskiest investments. This “reaching for risk” itself leads to episodes in which bank failure is prevalent and government bailouts are necessary to preserve the solvency of intermediaries. Merton (1978) points out that, in the absence of countervailing measures such as strict regulation, perennial crises should be the norm in the presence of deposit insurance.

Narrow banking, which would split the lending and payment services functions of banks into different institutions, is proposed as a possible means of avoiding the runs versus moral-hazard dilemma. In practical terms, Non-Bank Financial Institutions (NBFIs) would perform lending and finance themselves with longer-term liabilities.

Money Market Mutual Funds (MMMFs), with their ease of withdrawal and usually free check-writing, would perform liquidity and payment services.

The feasibility and optimality of narrow banking have been debated for some time. Gorton and Pennacchi (1993) argue that NBFIs are less prone to crises than depository banks, and that MMMFs can provide liquidity services. On the other hand, Miles (2003) examines the performance of bank and NBFIs lenders in Korea during the Asian financial crisis of the late 1990s and finds that the credit supply of NBFIs was more volatile than that of bank lenders.

It should be noted that not all observers agree that deposit insurance creates terrible moral hazard problems. Chang (2000) notes that, first, there are benefits to deposit insurance, and, second, that the moral hazard that such insurance supposedly creates may be overestimated. The author notes that while depositors may, upon being insured, fail to discipline banks, it is not clear how important such discipline would be in practice. Moreover, Chang (2000) notes that bank managers can lose their jobs and reputations if they take on excessive risk, even in the presence of deposit insurance. In addition, the author cites Kindleberger (1986), who points to losses by shareholders in the case of failing by (deposit) insured banks. Finally, Chang (2000, p. 781) points out that during Korea's crisis of the late 1990s, it was non-insured non-bank lenders, rather than banks, that "led the overlending process". In addition to leading to doubts about the magnitude of the moral hazard caused by deposit insurance, this latter point casts direct doubt on the efficacy of narrow banking.

The debate over narrow banking is thus unresolved and continues.

WILLIAM MILES

See also:

Bank deposits; Chicago Plan; Financial crisis; Financial instability; Investment banking.

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National Banking Acts

The National Banking Acts were a series of two US Congressional acts (in 1863 and 1864) designed to create a national banking system in the United States after the Civil War. On the eve of that war, the United States had a patchwork of State-chartered banks, each issuing its own banknotes. The US National Banking Acts were an attempt to establish a national currency and banking system, but also to support the market for US Treasury securities in order to finance the Civil War.

Prior to the Civil War, the primary sources of revenue for the US federal government had been tariffs and land sales, which were insufficient for mounting a full-scale war. In order to deal with the fiscal requirements of war, the Union approved a series of major reforms that were to fundamentally transform the nature of domestic finance.

After a general suspension of specie payments in 1861, the US federal government began to issue non-redeemable “greenbacks”. In addition to the creation of greenbacks, Samuel P. Chase, Secretary of the Treasury under US President Lincoln, proposed a national banking system. In the 1830s, free banking laws spread from State to State, allowing anyone with a specified amount of capital to establish a State bank (Rockoff, 1985). The National Banking Acts were to repeat this at a national level. The notes issued by these national banks would be uniform, and the banks would be required to meet minimum reserve and capital ratios. Importantly, banknotes were to be collateralized with holding of US Treasury securities at the Comptroller of the Currency, providing an enlarged market for US federal government debt. The Comptroller of the Currency thus strictly regulated banknotes.

Initially, very few applications for a national charter were received. As a result, the US Congress changed the law in 1864, imposing a tax on State banknotes and changing capital requirements. The banknote tax, in particular, seems to have prompted a rapid conversion and elimination of State banks (White, 1982).

Of major debate during the consideration of the National Banking Acts by the US Congress was the system of reserves. It was not clear whether national banks should be allowed to consider interbank deposits as reserves. In the end, a reserve hierarchy was established. New York would be the central reserve city, with a full 25 per cent of deposits and notes held in lawful currency. Other reserve cities had a similar total reserve requirement, but could hold a portion of this reserve in deposits in New York. Finally, national banks outside these cities had lower reserve requirements and could hold a little over half of their reserves in deposits in any reserve city (Sylla, 1969).

This tiered system is often said to have created a concentration of reserves in New York, and was criticized heavily. Sprague (1910 [1968]) called this a “pyramiding” that created a precarious situation. Additionally, the New York banks paid interest on reserves in competition for the deposits of other banks. The reserve deposits in New York were thus often lent out in the call market, which in turn meant that the fate of the New York banks lay heavily with other financial markets. If an emergency arose, banks outside New York could withdraw their reserves, prompting a crisis (Miron, 1986).

A persistent complaint of the national bank system was the “inelasticity” of the currency. In times of crisis, there was no lender of last resort for the New York banks to turn to, and no provision for the creation of additional legal tender. In particular, the system is often said to have been unable to accommodate seasonal demands for currency related

to the agricultural cycle (see Miron, 1986). Alternatively, Calomiris and Gorton (1991) have argued instead for an “asymmetric information” view of the crises in the national banking period.

The combination of reserve pyramiding and the inelasticity of the currency that resulted from the National Banking Acts are often cited as significant determinants of the many financial crises of the period. During this period, there were four large suspensions of convertibility (1873, 1893, 1907 and 1914). As Bordo (1986) notes, this was relatively uncommon in the developed world at the time. In addition, Grossman (1993) has shown that these banking panics had significant impacts on US output, likely aggravating the business cycle.

The death of the national banking system seems to have begun with the panic of 1907. The causes of the panic are varied and complex. It was reined in by a coalition of banks and trusts, famously led by J.P. Morgan. The US Congress subsequently passed the Aldrich–Vreeland Act, which allowed national currency associations that would be eligible for emergency currency in times of crisis. More importantly, the act also created the National Monetary Commission, which was to study the domestic banking system (and international and historical banking systems) to recommend changes. The recommendations of the Commission, in part, led to the eventual creation of a central bank designed to fix the previously described flaws in the national banking system.

NATHANIEL CLINE

See also:

Asymmetric information; Financial crisis; Greenbacks; Inconvertibility; *Monetary History of the United States, 1867–1960*; Reserve requirements.

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Natural rate of interest

In economics there are several references to natural magnitudes. One of the most famous among them, in both the history of economic thought – as epitomized by the work of

Wicksell (1898 [1936], 1906 [1934]) – and present-day monetary policy, is the natural rate of interest. In conformity with the nature of real objects, the natural rate of interest constitutes, in principle, a “real” rate of interest expressed in terms of some commodities. Although the natural rate of interest is not directly observable, it has a normative dimension for economic policy. For its nature, it represents a structuring concept for monetary policy, the central bank having to keep (as the rule dictates) its policy rate of interest in line with the natural rate of interest (which spontaneously emerges from the market for loanable funds) in order to avoid any inflationary or deflationary tensions on the market for produced goods and services. This confirms the neoclassical dichotomy between real variables and monetary variables (to wit, the postulate of homogeneity between relative and absolute prices): the natural rate of interest represents a gravitational centre, a real (but paradoxically unobservable) basis for the banks’ rate of interest (the rate that remunerates the credit granted by banks in a national economy), thereby withdrawing money from any discretionary interference of the sovereign.

Specifically, the natural rate of interest is defined by Wicksell (1898 [1936], p. xxvi; 1906 [1934], p. 193) as the rate of interest that balances the supply of savings (in the form of capital lent “in kind”) and the demand for savings (to finance fixed-capital formation) on the market for loanable funds (in this framework, banks just act as financial intermediaries). This natural rate of interest depends on “real” forces, respectively the marginal productivity of capital and the time-preferences of savers, and constitutes, in this respect, a standard for the conduct of monetary policy: in order to avoid any cumulative inflation or deflation on the market for produced goods and services, the monetary authority has to align its short-run policy rate of interest with the natural rate of interest. Now, while the natural rate of interest structures the whole Wicksellian (macro-)monetary equilibrium, it is not immune to criticisms.

The existence of a single natural rate of interest is indeed specious. According to Wicksell (1898 [1936], p. xxv), the natural rate of interest represents the equilibrium price on the market for loanable funds when capital is lent “in kind”, without the intervention of money. To this end, capital has to form (according to Wicksellian capital theory) a homogenous mass of primary factors of production (labour and land), as if there were only one good within the national economy. However, the physical heterogeneity of capital goods prevents the determination of a unique rate of profit on the market for loanable funds – the mobility of these goods between their respective markets (a condition necessary to equalize the rates of profit for each capital good) being formally impossible (the homogenization of the various capital goods in monetary prices is then only assumed). The natural rate of interest being unspecified in a national economy with several goods, the banks’ rate of interest no longer has any gravitational centre serving as an anchor. In a monetary economy, it represents, by default, a conventional variable, managed by the monetary authority, which cannot adhere to a rule for guiding its monetary policy decisions. Furthermore, even if this gravitational centre (the natural rate of interest) existed in a monetary economy, it would itself be affected by the object in orbit (the banks’ rate of interest), economists borrowing from physics the term “hysteresis” to qualify this phenomenon (which calls into question the neutrality of money and the homogeneity postulate).

The shortcomings of Wicksellian capital theory favoured, in the second half of the nineteenth century, the development of intertemporal general equilibrium models *à la*

Arrow–Debreu, and their application (since the 2000s) to economic policy. In this framework, central banks now use dynamic stochastic general equilibrium (DSGE) models to assess the – *ex-ante* and *ex-post* – impact of monetary policy decisions on the level of economic activity and the general price level. Again, the natural rate of interest plays a structuring role in the monetary policy reaction function of the central bank. Indeed, the neo-Wicksellian approach to monetary policy (Woodford, 2003, pp. 49–55), currently in fashion within many central banks, specifies that the latter, by handling their short-run policy rates of interest, have to target the natural rate of interest in order to ensure price stability and to keep output growth around its potential level. In DSGE models, the natural rate of interest is equivalent to the long-run rate of interest in a national economy where prices would be completely flexible: it would depend then on the same real forces as in Wicksellian theory. Consequently, a gap (which corroborates the production gap) between the banks’ real rate of interest (in the Fisherian sense) and the natural rate of interest stems from a short-run viscosity of prices, to wit, a number of nominal rigidities (prices and contracts being expressed in monetary units). The natural rate of interest then represents an indicator of the inflationary or deflationary nature of the current stance of monetary policy, which, as a result of the aforementioned rigidities, influences short-run economic activity (note that, owing to the non-monetary nature of DSGE models, money is reduced to being a mere friction). Now, the natural rate of interest is, as in its Wicksellian version, a pure intellectual construct, unobservable in practice and highly normative (as it would correspond to an ideal situation of complete price flexibility): it is then not immune to the hysteresis critique pointed out above. The central bank will then estimate the natural rate of interest, or rather the above-mentioned rate of interest gap, according to the general price level: a (circular) *tour de force* that Wicksell (1898 [1936], pp. 165–77) had already advocated more than a century ago.

JONATHAN MASSONNET

See also:

Classical dichotomy; Endogenous money; Interest rates setting; Monetary policy objectives; Taylor rule; Wicksell, Knut.

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Negative rate of interest

Nominal interest rates are generally conceived as positive magnitudes, mirroring the notion that borrowers pay the lender a positive rate of interest on the funds borrowed. Contrary to what is commonly argued in the literature, a constraint on nominal interest rates does not technically exist. This implies, in practice, that nothing prevents nominal (market or policy-controlled) rates of interest from falling below zero and assuming negative values. Should this be the case, then the interest rate would act as a “tax” on the

lender, who, at least in nominal terms, suffers a loss at the expense of the borrower – who receives a positive rate of interest on the amount owed.

As far as monetary policy is concerned, the rationale for the introduction of negative interest rates has been provided by Gesell (1916 [1958]), who introduces the possibility of imposing a “tax on money” as a means to stimulate economic activity once the zero lower bound on nominal interest rates has been reached (see Ilgmann and Menner, 2011, pp. 386–9, for a discussion of Gesell’s proposal). More recently, a number of economists have supported the idea of setting negative central bank policy rates of interest. Svensson (2009, p. 8), for instance, argues that a slightly negative policy rate would not prompt depositors to withdraw their deposits *en masse* from bank accounts (should the interest rate paid on bank deposits also become negative). Indeed, inasmuch as hoarding large volumes of cash (banknotes and coins) is inherently costly owing to storage, handling and transaction costs, cash provides “an actual yield that corresponds to a negative interest rate” (Svensson, 2009, p. 8). Accordingly, even if the policy-controlled short-run interest rate were negative, the demand for cash would presumably remain more or less stable. This implies, in the words of Svensson (*ibid.*, p. 8), that a policy rate of interest of zero percent (or slightly negative) “would not entail any significant problems”.

To be sure, during the twentieth century episodes of negative interest rates have been fairly unusual and isolated. One exception in this regard has been the Swiss National Bank, which, during the 1970s, imposed negative rates of interest on short-term deposits denominated in Swiss francs to prevent an excessive appreciation of the domestic currency on foreign-exchange markets, especially *vis-à-vis* the deutschmark. This unprecedented experiment, which yielded less than satisfactory economic outcomes (see Kugler and Rich, 2002, p. 246), remained, however, exceptional. Evidence of this is that no other major central bank resorted to negative interest rates during the “Great Moderation” (from the mid 1980s until 2007).

Unsurprisingly, negative interest rates have gained renewed interest following the onset of the 2008–09 global financial crisis. Already in 2009–10 and 2012 respectively, the deepening of the euro-area crisis forced the Riksbank (the central bank of Sweden) and the Danmarks Nationalbank (the central bank of Denmark) to introduce negative interest rates on overnight bank deposits in order to deter foreign capital inflows, which put upward pressure on the exchange rate of their domestic currencies against the euro. More importantly, the European Central Bank (ECB) decided on 5 June 2014 to lower one of its main short-run policy rates of interest, specifically the rate on the deposit facility, to below zero percent. Against the backdrop of growing deflationary risks, this unprecedented move in the history of the ECB is designed to exert upward pressure on the price level and stimulate economic activity by (i) encouraging commercial banks to lend out their excess reserves (“idle balances”) to the real economy instead of holding them at the ECB (for which they would now have to pay a tax), thereby sustaining the flow of credit; and, more subtly, (ii) putting downward pressure on the exchange rate of the euro against major international currencies in order to boost the price-competitiveness of the euro-area economy.

Now, whether and to what extent negative interest rates succeed in achieving these objectives is highly uncertain. First, nothing ensures that banks respond to negative deposit rates of interest by lowering the rate of interest on loans granted to the private non-financial sector. As a matter of fact, in so far as negative central bank deposit rates

of interest act as a tax on banks, the latter may be inclined to pass on the cost of the tax to their customers, either increasing lending rates of interest and/or decreasing the rate of interest paid on short-term bank deposits (or leaving this rate unchanged, but imposing a fee for account maintenance). Moreover, even assuming, *arguendo*, that negative deposit rates of interest are fully passed on in lower bank lending rates of interest, banks may choose to place their excess reserves in financial markets, where they can earn a higher rate of return, possibly jeopardizing financial stability if a sufficient number of banks “move forward in step” (Keynes, 1971, p.23). Second, in an endogenous-money framework, banks do not need excess reserves to lend to any kind of economic agents. This is so because banks are not reserve-constrained and can always lend if they choose to, provided there is a demand from creditworthy borrowers. This point brings us to another issue: the “supply-side” assumption underlying negative interest rates is that it is sufficient to lower the policy-controlled interest rate to encourage consumption and investment. Nevertheless, as Keynes (1936 [2007]) notes, if effective demand is low and expectations about the future are pessimistic, both households and businesses will be reluctant and unwilling to borrow, even at negative interest rates. To put it bluntly, if “the horse is not thirsty” (meaning that the demand for credit is low), any attempt to stimulate the economy through increased credit availability is unlikely to succeed.

FABIO S. PANZERA

See also:

Bank deposits; Cash; Effective lower bound; Euro-area crisis; European Central Bank; Financial crisis; Financial instability; Fisher effect; Policy rates of interest; Swiss National Bank; Zero interest-rate policy.

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Norges Bank

Founded in 1816, the Norges Bank – that is, the central bank of Norway – is one of the oldest central banks in the world. It has executive and advisory responsibilities in the area of monetary policy and is responsible for promoting robust and efficient payment systems and financial markets. It also manages Norway’s foreign-exchange reserves and the Government Pension Fund Global, one of the largest pension funds in the world. The objectives of Norges Bank’s core activities are price stability, financial stability, and added value in investment management.

During the first century of its operations, the Norges Bank exercised a high degree of

independence from the central government and built a reputation of credibility and confidence in defending first silver convertibility and thereafter gold convertibility (Øksendal, 2008). It was in full operation by 1818, but it was not until 1842 that full convertibility at par values against silver was reintroduced after 85 years with a paper money standard. In 1875, Norway joined the Scandinavian Monetary Union, together with Denmark and Sweden, but retained its own central bank and monetary system. This led to the three countries' currencies circulating as legal tender on the same basis against gold.

Gold convertibility was suspended in August 1914 and was not firmly re-established before May 1928. The central bank was a strong advocate for a return to the external value of the krone ("par policy") throughout the 1920s, but was increasingly criticized (Thomassen, 2012). The strict monetary policy stance led to high unemployment, as in many other countries, and eventually undermined the bank's legitimacy as an independent institution.

After the Second World War, political control over Norges Bank was tightened and monetary policy subsumed under the national economic plan. Credit was tightly controlled and capital controls allocated scarce foreign exchange to priority investments. Nevertheless, Norges Bank maintained a relatively high degree of operational independence during this period. But it would take another 30 years before Norges Bank was granted instrument autonomy and could use interest rates to support the exchange rate of the krone (Venneslan et al., 2011).

The current inflation targeting regime was introduced in March 2001 and Norges Bank now sets short-term interest rates aimed at keeping inflation rates at around 2.5 percent, although monetary policy also aims at stabilizing output and employment levels; thus the inflation targeting regime is flexible. (Regardless of the form it took, inflation targeting has been criticized after the global financial crisis that erupted in 2008, as it became clear that central banks had not paid enough attention to asset price bubbles (Frankel, 2012).)

Norges Bank presents macroeconomic projections and a consistent interest-rate forecast in its monetary policy reports. Forward guidance has been part of its monetary policy communication since 2004. This has added transparency about the future conduct of monetary policy (Olsen, 2014).

Another key objective for Norges Bank is financial stability. The Nordic banking crisis in the early 1990s led the Bank to focus on financial stability risk analysis and surveillance of the financial system (Moe et al., 2004). The Bank was among the first central banks to publish separate financial stability reports, including an assessment of the situation in the financial sector in general, and the banking sector in particular. These reports included comprehensive risk reviews of the non-financial corporate sector and the household sector based on detailed micro-data. The reports also contained stress tests of banks based on the probability of shocks or disturbances that could lead to instability.

The global financial crisis that burst in 2008 showed that micro-prudential supervision of banks and financial stability reporting were insufficient to safeguard the stability of the whole financial system. Central banks need new tools to support their financial stability analysis. This has led to the concept of macro-prudential policy, where systemic risk assessments are complemented with specific instruments that are complementary to the central bank's monetary policy tools. As a result of this co-dependence, Norges Bank decided to merge its monetary policy analysis and its financial stability review into a new joint report in 2013 (Norges Bank, 2013). Since then, this new report has been published

four times per year, and it now forms the basis for Norges Bank's monetary policy and advice on the countercyclical capital buffer.

When the 1985 law was adopted, Norges Bank ceased to be a limited company and became a separate legal entity owned by the State. The relationship between Norges Bank and the government authorities are regulated in Section 2 of the Norges Bank Act of 1985, where it says that "before the central bank makes any decision of special importance, the matter shall be submitted to the Ministry of Finance". This allows the government to intervene in exceptional circumstances and direct the central bank before it takes action. However, this authority has never been used in practice and Norges Banks enjoys considerable operational independence.

THORVALD GRUNG MOE

See also:

Asset price inflation; Bank of England; Bubble; Central bank credibility; Central bank independence; Credibility and reputation; Financial crisis; Financial instability; Forward guidance; Inflation targeting; Macro-prudential policies; Settlement system.

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Norman, Montagu

Montagu Norman (1871–1950) presided over the Bank of England from 1920 to 1944. Known as "the old fox", he came from three generations of prominent British bankers, and worked for the British arm of Brown Brothers. Norman's orthodox monetary approach led him to promote Britain's disastrous return to the gold exchange standard in 1925. Monetary debates of the time centred on whether it was wiser for policy makers to stabilize the exchange rate of a nation's currency or the prices of domestically consumed products, as one did not appear to guarantee the other in practice.

Attempts to preserve London's place as a premier site for global finance in the wake of the First World War demanded, according to Norman, a return to the gold standard at pre-war parity. Moreover, his class background, as well as the nature of his charge, left him with strong allegiances to *rentier* interests. From Norman's perspective, taking Britain off the gold standard was effectively a breach of contract with pre-war holders of fixed interest-bearing bonds. Along with Britain's loss of creditor-nation status fol-

lowing the war, this further ensured that the City would lose its much-vaunted place in international finance.

The price to be paid for this decision was high, as Keynes (1963, ch. 5) and other heretics warned. First, British exporters would lose market share unless they reduced prices of tradeable goods to offset the effect of a 10 per cent upward revaluation of sterling against the US dollar. Similarly, UK producers would have to reduce their prices of goods competing with imports. Barring productivity gains and/or offsetting cost-cutting, the profit margins of companies in the tradeable goods sector were likely to be squeezed, with production and employment cuts following diminished profitability. Next, interest-rate policy would be consigned to maintaining the new exchange-rate parity, regardless of domestic economic conditions. Both elements in turn implied that a wage deflation would likely follow. The unspoken mechanism for achieving wage deflation was unemployment, achieved directly and indirectly through both policies of currency appreciation and credit restriction. The inter-war stagnation in the British economy was thereby ensured.

In addition, as Keynes (1963, p. 269) pointed out immediately after the 1925 return of the United Kingdom to the gold exchange standard, “it is of the essence of any policy to lower prices that it benefits the receivers of interest at the expense of the rest of the community”. In fact, in the United Kingdom average short-term interest rates in the 1925–31 period were 5 per cent, which, combined with a deflation rate in prices of 3 per cent, implied real interest rates of 8 per cent. Political polarization in response to the rise of *rentier* interests, as well as the attack on labour in trade-exposed industries, was evident in the general strike of 1926, though this backlash did not appear to deter Norman.

Five years later, under interrogation by the Macmillan Committee, Norman proved especially evasive (see his response to Mr Bevin’s inquiries in Einzig, 1932, pp. 191–2), at times arguing that he could not recall the sequence of events leading up to the British return to the pre-war gold parity. As the UK current account deficit deepened during the 1931 world depression, and the failure of Austria’s Credit Anstalt Bank resulted in a freezing of assets in the British banking system, the revelation from the Macmillan Committee report that Britain’s short-term external liabilities exceeded its assets contributed to a run on sterling. With the rate of unemployment at 20 per cent, and dependence on credits from the US Federal Reserve and the Banque de France (neither of which wanted to push their own policy rates of interest any higher), Norman elected to hike the policy rate of interest only from 2.5 per cent in May to 4.5 per cent, before choosing to abandon the gold standard in September. Still a convinced “sound money” man at heart, Norman signed a July 1932 declaration from the board of the Bank for International Settlements (BIS) that advocated a restoration at the earliest possible time of the gold standard in all countries that had suspended it. Lessons were thus left unlearned.

Norman is also reported to have prevailed upon the Governor of the New York Federal Reserve Bank to keep policy rates of interest lower in the United States between 1925 and 1928 than they otherwise would have. While this reduced the need for the Bank of England to raise its policy rates of interest to maintain the fixed exchange rate of the sterling, hoping thereby to induce higher tradeable goods prices in the United States (thus reducing the need for UK price deflation), some believe (see Ahamed, 2009, ch. 15) that this informal cooperation contributed to the build-up in private debt that fuelled the stock market boom in the United States. In particular, Governor Adolph Miller provided

Congressional testimony confirming that Norman, among other European central bankers, had actively and effectively lobbied the US Federal Reserve for a discount rate cut in 1927 in order to deter holders of gold from transferring it to the United States – particularly after the French government had withdrawn gold from the Bank of England. At the same time, Norman's attempt to attract gold inflows by pushing up the policy rate of interest to 6.5 per cent in 1929 may have played a role in the bursting of the equity market bubble in the United States.

Norman was also an ardent supporter of Hjalmar Schacht, who played instrumental roles in the Reichsbank and the Ministry of Finance throughout Germany's Weimar Republic, and well into the period of Nazi rule as well. For example, he did not protest against BIS instructions to shift gold holdings of Czechoslovakia over to the Reichsbank following the German invasion in 1939. London merchant banks, like several large US banks, were also believed to be heavily involved in sustaining the German financial system, and Norman is believed to have encouraged such support.

Montagu Norman, who left the Bank of England before its nationalization in 1946, will always be remembered as an advocate of "sound money", fixed exchange rate regimes, central bank opacity, and central bank independence. While steadfast in holding onto the trappings of nineteenth-century central banking, Norman's orthodox monetary predilections during his long reign at the Bank of England eventually contributed to the decline of sterling's role in international finance, and to the further decline of this once imperial economy.

ROBERT W. PARENTEAU

See also:

Bank of England; Bubble; Central bank independence; Federal Reserve System.

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O

Open-market operations

Open-market operations are the process of buying and selling securities in the open market by the central bank. In modern economies most open-market operations are conducted to control a short-term interest rate that monetary authorities use as a benchmark for all other interest rates. This is usually the overnight lending rate of interest, or the interest rate at which banks lend and borrow to and from other banks in order for them to meet their overnight reserve requirements (such as the federal funds rate in the United States). At the end of each business day, banks must settle their debt with each other and meet their overnight reserve requirements. Surplus banks lend reserves to deficit banks creating a market for overnight lending. The central bank uses open-market operations to affect the total amount of reserves in the banking system, which changes the interest rate on the interbank market. The central bank also stands ready to accommodate banks' reserve needs through lending reserves to them at the discount rate of interest.

Central banks primarily use short-term debt and repurchase agreements (repos and reverse repos) in order to conduct open-market operations. A repurchase agreement means that central banks do not buy securities outright from banks in order to hold them indefinitely. Instead, central banks use repos to lend reserves for a short period of time to banks, which promise to pay back the reserves; short-term treasury debt usually serves as collateral in these transactions (Lavoie, 2009). These transactions are conducted electronically between the central bank and other banks.

Central banks use open-market operations for several purposes. The first is the use of dynamic open-market operations, where the central bank decides to change its target rate of interest by making larger sales or purchases of short-term debt with the purpose of changing the level of reserves and thus the interest rate on the overnight market. The second is the use of defensive open-market operations, where the central bank buys or sells short-term debt (using repos) to accommodate the settlement needs of banks. In this case the central bank supplies reserves and accommodates the banks' need for settlement balances. Central banks usually "neutralize" the changes in the interbank market that would cause the short-term interest rate to deviate from the target rate of interest (Monvoisin and Rochon, 2006). The third use of open-market operations was clearly illustrated during the global financial crisis that erupted in 2008. Once interest rates hit the lower bound, many central banks began using open-market operations to buy long-term debt in addition to short-term debt. This has been labelled "quantitative easing" (QE). The goal of QE is to buy long-term bonds (such as 10- to 30-year Treasuries) with the aim of pushing up their price and thus lowering their yield. This also has the effect of flooding banks with excess reserves and liquidity. This directly lowers long-term interest rates, which affect business investment, large consumer purchases and housing. This was not new to the 2008–09 crisis, however, as Japan used this policy in the 1990s in an attempt to boost its depressed economy (Guttman, 2012). The purchase of long-term bonds is important, because the link between the short-term policy rate of interest and the long-term Treasury yield is not consistent and not clear, hence purchasing debt on the

long end of the yield curve allows the central bank to directly lower long-term interest rates.

Open-market operations were discovered and have evolved through distinct institutional and historical circumstances. For example, Burgess (1964) explains that in the United States the Federal Reserve only used the discount rate of interest for policy reasons until 1923. Before the United States entered the First World War, its public debt level was so low that there was not enough volume or liquidity available to effectively conduct open-market operations. The US Federal Reserve was always involved in the bill market (as was the Bank of England), in order to provide dealers with a supply of funds when the latter were not available from surplus banks, but open-market operations were usually conducted to a much smaller extent and only for liquidity and stability purposes, and not for broader macroeconomic policy. After the First World War, the falling profits of the US Federal Reserve banks (owing to member banks paying off loans with gold flowing from abroad) forced them to purchase US Treasury bonds to stay solvent. US Federal Reserve banks discovered that purchasing Treasuries created liquidity for banks, thus allowing the latter to pay off their borrowings as well as an easier flow of lending. This led to the first two major purposeful open-market operations in 1923 and 1927. Since that time, open-market operations have evolved significantly.

Post-Keynesians emphasize the accommodative role that central banks and open-market operations play. They consider open-market operations as the means for controlling the policy rate of interest, and do not believe that the central bank can control money supply the way it controls banks' reserves, nor can open-market operations be the primary tool to fight inflation. Ultimately money is created endogenously within the banking system, and not only through open-market operations.

NATHAN PERRY

See also:

Collateral; Endogenous money; Federal Reserve System; Financial crisis; Interest rates setting; Long-term refinancing operations; Monetary policy instruments; Open-mouth operations; Policy rates of interest; Quantitative easing; Repurchase agreement; Reserve requirements; Sterilization.

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Open-mouth operations

The ability of central banks to set interest rates is tied to the fact that banks settle in the books of the central bank. The question of how the central bank sets short-term interest rates in practice has attracted a lot of attention in post-Keynesian monetary economics literature. At the same time central bankers have themselves attempted to communicate how monetary policy is implemented.

The expression “open-mouth operations” was coined by Guthrie and Wright (2000) in order to distinguish them from open-market operations. It refers to communication strategies put into practice by central banks to change interest rates as opposed to maintaining the short-term rate of interest at a given level.

Guthrie and Wright’s (2000) finding after investigating the operating procedures of the Reserve Bank of New Zealand was that the announcement of a change in policy rates of interest has a far more powerful effect than open-market operations in order to change the rates of interest on the marketplace. This justifies the expression “open-mouth operations”.

Still, to date most monetary economists and market commentators incorrectly assume that when a central bank changes short-term interest rates this requires additional open-market operations of the central bank far in excess of normal day-to-day operations. As Lavoie (2005) points out, when central banks wish to increase or decrease short-term interest rates, they simply need to make an announcement and the actual overnight rate of interest will gravitate to the new anchor within the day of the announcement.

The idea can be appreciated by understanding the defensive operations (Lombra and Torto, 1973; Eichner, 1987; Moore, 1988; Rochon, 1999) or neutralizing operations of the central bank. The objective of these operations is to offset the effects of other factors affecting reserve balances to keep the level of reserves unchanged. One example is flows in and out of the government Treasury’s account at the central bank. Another example is an increase in demand by the non-banking sector to hold more currency. In the first case, the central bank may offset the flows by repurchase (“repos”) or reverse repurchase agreements, or by letting previous repos or reverse repos expire. In the second case, the central bank may neutralize the flow by buying government securities in the open market.

Neutralizing or defensive operations are not restricted to temporary or permanent open-market operations. The central bank has additional tools such as moving government deposits between its accounts at the central bank and the banking sector, thereby affecting reserve balances.

The arguments above highlight the principle that the central bank’s open-market operations (in a corridor system) are endogenous responses to provide banks the reserves they require (see Eichner, 1987). Of course, when central banks adopt the floor system at times in which the target for short-term interest rates is also the interest paid on banks’ settlement balances at the central bank, they can increase settlement balances autonomously via open-market operations. In either case, a simple announcement to increase interest rates is sufficient to change the rate of interest at which banks lend to each other in the overnight market and thereby affect the structure of the whole yield curve. Hence the expression “open-mouth operations”.

In recent times, central banks have used unconventional ways to impact the term structure of interest rates. In mid 2012, when Spanish government bond yields rose so much as

to raise fears of contagion to the rest of the euro area, Draghi (2012) intervened verbally in a speech on 26 July 2012 and announced that “the ECB will do whatever it takes to preserve the euro, and believe me, it will be enough”. In the September 2012 monetary policy press conference, he outlined a programme called “Outright Monetary Transactions” in which the Eurosystem could buy government bonds with no *ex-ante* defined quantitative limits. This was sufficient to calm the bond market participants and world financial markets in general: 10-year yields on Spanish government bonds moved from 7.56 per cent in July 2012 to reach a low of 4.04 per cent in May 2013, without the ECB actually having to purchase Spanish government bonds.

Recently, the US Federal Reserve has also started using its monetary policy statements to communicate the future stance of its policy, including providing dates through which short-term rates of interest are likely to remain unchanged. For example, the August 2011 statement (US Federal Reserve, 2011) said that the monetary policy committee “anticipates that exceptionally low levels for the federal funds rate are likely to be warranted at least through mid-2013”. Needless to say, such communication tools have helped the Federal Reserve to achieve its objective of a low interest rate environment.

VIJAYARAGHAVAN RAMANAN

See also:

Draghi, Mario; Endogenous money; Euro-area crisis; Forward guidance; Interest rates setting; Open-market operations; Outright monetary transactions; Repurchase agreement; Settlement balances; Sterilization.

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Operation Twist

“Operation Twist” refers originally to a policy undertaken by the US Federal Reserve (Fed) and the US Treasury in the first half of the 1960s to “twist” the yield curve by raising short-term interest rates and lowering long-term rates. It was first named “Operation Nudge”, but then renamed for “The Twist”, a dance craze in the United States at the time of its implementation.

The major motivation for the policy was the US balance-of-payments deficit at the

time. The United States was running a positive balance on trade account, but capital outflows were outweighing this. Under the Bretton Woods agreement, the United States was obligated to deliver gold to foreign governments who presented it with US dollars. In the first decade after World War II, this was not a problem, as the US dollar had become the *de facto* international reserve currency, and there was a US dollar shortage in the rest of the world to fund international payments. By the late 1950s this was turning into a “US dollar glut” because of the tremendous outflows of US dollars to undertake investment in Europe and elsewhere. After embarking upon what some called his “politics of grandeur” in 1962, President Charles De Gaulle of France even began to demand gold from the United States for the US dollar balances accumulating in the accounts of the Bank of France.

The Fed and US Treasury believed that higher short-term rates of interest on US dollar-denominated securities would raise foreign holdings of them and so reduce the US dollar outflow. This was the classical remedy for a country fearing a gold drain. As the United States had experienced higher rates of unemployment than desired in the 1950s, the incoming Kennedy Administration was proposing a tax cut for macroeconomic stimulation and wanted to keep long-term interest rates low for the purposes of supporting spending by households and businesses on housing construction and long-lived business plant and equipment.

Operation Twist, which began in February 1961, was to be implemented by having the Fed begin to buy long-term US Treasury bonds and to sell short-term US Treasury bills, while the US Treasury would, in its refunding operations, decrease the maturity of its debt. In the segmented markets theory of the term structure of interest rates, buyers and sellers remain in particular maturity regions of the market. Long-term (short-term) projects are funded with long-term (short-term) borrowings, and buyers stay in the short or long end of the market because their liabilities are short-dated, like bank deposits, or highly predictable over the long term, like insurance claims or pension obligations.

The opposite view, that arbitrage across maturities is perfect, implies that the yield curve simply follows expectations of future interest-rate movements, rising when interest rates are expected to rise and falling when they are expected to fall, as longer-term securities will need to compete with higher or lower rates of interest on newly-issued securities in the future. As expectations are not known with certainty, while some arbitrage across maturities is feasible, neither of these extreme views should prevail. The idea that lenders and borrowers have a “preferred habitat” but will leave those maturities if differences in interest rates are enough to overcome the risk of doing so seems to be more plausible. As the dominant preferences should tilt towards the short end for lenders and the long end for borrowers, the yield curve is argued to be governed by expectations of future interest-rate movements but biased upwards relative to these expectations (see, for instance, Malkiel, 1966).

The success of Operation Twist thus needed to rely on the existence of at least some reluctance to leave preferred habitats – enough, that is, to allow the yield curve to be “twisted” somewhat – or required the policy to change expectations, so that players in the market would not expect long-term rates of interest to rise, which would cause them to be reluctant to hold long-dated securities. The evidence for success, however, is not strong. The most-often-cited studies, by Modigliani and Sutch (1966, 1967), using quarterly data to estimate the effects, found nothing statistically significant. In a recent study using a

high-frequency event study of announcement effects, Swanson (2011) has found statistically significant, though not economically significant, effects.

The implementation of the policy by the Fed and US Treasury may have been weaker than necessary, as both seemed uncomfortable in departing from previous operating procedures. Of course, there simply may not have been sufficient segmentation in the markets to allow the desired amount of “twist”, and as the United States was recovering from a business cycle trough, dated at the month the policy began, expectational effects supported an upward-sloping yield curve.

Operation Twist was officially called off in 1965. By 1966, the US economy was starting to be threatened by a rising price level and interest rates at all maturities were rising.

The name “Operation Twist” took on a new life following the 2008 financial crash. The Fed began a policy of “quantitative easing”, buying long-term US Treasuries and mortgage-backed securities to try to lower long-term rates of interest, as short-term rates quickly fell to near zero. What became called “QE2” was said by some to be a new version of Operation Twist, as bank reserves were to be issued to buy long-term bonds (Swanson, 2011).

TRACY MOTT

See also:

Bretton Woods regime; Dollar hegemony; Effective lower bound; Federal Reserve System; Financial crisis; Interest rates setting; Interest rates term structure; Policy rates of interest; Quantitative easing; Yield curve; Zero interest-rate policy.

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Optimal international currency reserves

International reserves are reserve assets held by central banks to absorb irregular foreign currency inflows, to proceed with appropriate monetary policy when needed and to engage in foreign-exchange market operations. These international reserves can be held as foreign currency deposits and bonds, gold, special drawing rights, and/or International Monetary Fund (IMF) reserve positions.

Under the gold standard, most countries held reserves in the form of precious metals (notably silver and gold) as a store of value, but the main purpose was to back national fiduciary paper bills and coins as well as to settle international transactions. Under that scheme, wealthier countries that tended to run a trade surplus in the form of gold payments could accumulate more gold reserves, while countries that ran a deficit depleted their gold reserves and therefore needed to limit their money supply. Theoretically countries had to hold 100 per cent of the value of the issued money in gold reserves, but this was not necessarily the case.

Following the Bretton Woods agreements after World War II, the US dollar was established as the *de facto* international reserve currency and used as a peg by other currencies, while the US dollar itself was the only currency directly pegged to gold. Other governments held US dollars (as well as gold and other convertible currencies) for the purpose of maintaining a fixed exchange rate to the US dollar within a 1 per cent range, while higher than 10 per cent variations needed IMF approval (International Monetary Fund, 2013a). In that sense, international reserves were held “at the disposal of the authorities to finance external imbalances without having to engage in any form of domestic adjustment measures” (Bordo and Eichengreen, 1993, p. 272) and also for the “purpose of currency stabilization and balance-of-payments financing” (*ibid.*, p. 273). During that era and since capital mobility was less acute than nowadays, most countries used international reserves to maintain a fixed parity and to honour international transactions. Thus the optimal level of reserves depended on the country’s balance of payments.

Since the end of the Bretton Woods regime, many countries adopted flexible exchange rates implying that the exchange rate of their currencies is left to fluctuations on the foreign-exchange market. An increase in demand for a specific currency usually induces an appreciation of that currency, while a decrease in demand induces a depreciation. A natural conclusion follows: a floating exchange-rate regime would reduce the importance of international reserves, as there was no need to maintain fixed currency rates any more. But surprisingly there was a resurgence in the volume of reserves held by different central banks, as national governments were not inclined to relinquish what became an effective economic policy tool against an unpredictable environment. In this regard, international reserves started being primarily used as precautionary reserves. In other words, they serve as an insurance against risky international market fluctuations.

The type of international reserves held is usually an easy task to determine. Greenspan (1999) argued that “monetary authorities reserve only those currencies they believe are as strong or stronger than their own. Thus, central banks’ reserve balances except in special circumstances hold no weak currencies”. Today, most countries hold international reserves in currencies or other assets denominated in US dollars, euros and Japanese yen, and on some other occasions in British pounds, Swiss francs, Canadian dollars and Australian dollars. In the case of a developing country, the proportions of international reserves held are usually determined in relation to the proportions of currencies used in international transactions by the country. But what determines the volume of international reserves?

As stated before, the underlying reason for using international reserves in the post-Bretton-Woods regime is to insure against risky international market fluctuations. That risk is assessed differently depending on the type of economy. Developing countries that are faced with balance-of-payments disequilibria and current-account deficits are usually constrained by shortages of foreign currencies: the inability to pay for short-term imports and defaulting on short-term debt coverage represent the basis for international reserve accumulation. Thus several rules of thumb have been advised by foreign monetary authorities and economic policy makers that developing countries should store 90 days’ worth of imports in international reserves, which should cover a short period of market fluctuation in case of an international crisis. Following the same analysis, the Guidotti–Greenspan rule advises that the optimal reserve volume should cover a country’s short-term debt denominated in convertible foreign currencies. At another level,

developing countries with managed floating exchange rates that are usually at risk of capital flight need to continuously back their currency and therefore usually hold up to 20 per cent of their volume of bank deposits (measured by M2) in international reserves. Following these guidelines, we can distinguish three bases for the post-Bretton-Woods optimal international reserves that are relevant for developing countries with constrained balances of payments: coverage of short-term debt, coverage of short-term imports, and reserve backing to M2. It is important to mention here that developing countries' creditworthiness could be impacted by how much reserves they hold and that rating agencies do take into account these countries' stock of foreign reserve assets in their rating scheme.

Other emerging countries with current account surpluses, like China and oil-producing countries, hold international reserves with a different purpose. As they do not present a constrained balance of payments, their reserve holding is merely an investment as well as insurance in a stronger store of value than their own national currency. The US dollar and gold are thus perceived in general as a refuge store of value and therefore it is extremely difficult to analyse the optimal level of accumulation of these reserves on a country-by-country basis. Further, some of these assets are held in sovereign funds used for investment opportunities worldwide. It is clear that these countries are accumulating more than the previously suggested guidelines. As a result, Dooley et al. (2004) argued that these countries' international reserves assets are just unintended consequences of other economic policies.

Most other advanced countries with current-account as well as balance-of-payments surpluses hold international reserves with yet a different aim. Since they follow a floating exchange-rate regime, they intervene on some occasions where market discrepancies could generate currency crises. For example, the whole euro area held approximately only 1.3 months' worth of imports in total reserves in 2009, while China, Brazil and Saudi Arabia had respectively 28, 21 and 68 months of total reserves (International Monetary Fund, 2013b).

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See also:

Bretton Woods regime; Capital flight; Dollar hegemony; International Monetary Fund; International reserves.

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Optimum currency area

The literature on optimum currency areas (OCAs) has its antecedent in Mundell (1961), who posed the question of the ideal geographical space for a single currency. Mundell's (1961) concern was with the destabilizing effect of an asymmetric shock in the presence of rigid prices once exchange rates and a sovereign monetary policy is abandoned. For him, only a high intra-regional mobility of factors (labour) could avoid large and sustained external and real imbalances. McKinnon (1963) and Kenen (1969) argued respectively that the cost of joining a single currency area could be reduced by a country's openness (the higher its openness, the lower the cost of relinquishing the exchange rate) or product diversification (as negative shocks could be balanced out across regions) and fiscal transfers (in case these shocks did not balance). These initial contributions were extended by a range of additions, including the need for wage and price flexibility and asset diversification, in the late 1960s and early 1970s.

The popularity of OCA theory has been closely tied to the progress of European monetary union, but its actual impact has been small. Indeed, most economists agree that the euro area is not an OCA (see De Grauwe, 2009). Nevertheless, the European Commission (EC) argued in its "One market, one money" report (European Commission, 1990) that monetary union would be beneficial due to strong (dynamic) efficiency gains (resulting from reduced transaction costs and exchange-rate uncertainty) and positive effects on price stability. The cost of losing monetary policy and the exchange rate as an adjustment mechanism were considered to be minor. In fact, the euro was not introduced because euroland was considered an OCA, but because of the failure of the European Exchange Rate Mechanism and the perception that monetary union was an integral part of the wider process of economic and political integration. The specific form in which the euro was introduced was based on a large dose of optimism about its supply-side effects and on a monetarist outlook on fiscal and monetary policies.

The euro's actual experience differed from that predicted by the EC. The positive supply-side effects failed to materialize (Ziltener, 2004), and a decade with moderate economic growth and growing current-account imbalances followed the changeover to the euro. Current-account imbalances came with speculative capital flows, which fuelled property price bubbles in several countries. When the crisis erupted, it soon turned into a sovereign-debt crisis. Nation states were cut off from financial markets, with the European Central Bank reluctantly playing the role of a lender of last resort for banks and even more reluctantly for the governments of its member countries.

The EC's analysis was misleading on two accounts. First, monetary union led to real divergences and financial bubbles rather than supply-side-led economic growth. Second, the loss of independent monetary and exchange-rate policy proved to be very costly in a crisis period. Governments in trouble, not having a sovereign central bank, had to turn to the EU and, effectively, to the richer countries within the euro area. This turned what would have been a currency crisis into a crisis of peripheral member states within the euro area.

The traditional OCA literature had highlighted that asymmetric shocks could lead to divergence in a monetary union. But in line with its view of money as a transaction device, this could be solved by price flexibility and labour mobility. By contrast, the neo-chartalist approach regards the State as the origin of money and the issuance of currency

as one of the foundations of State power and finances (Goodhart, 1998). The central bank has a double role as the banks' bank and the government's bank. Two conclusions follow. First, the separation of the monetary and fiscal space as promoted by OCA literature is likely to destabilize nation states. Second, in Europe, monetary integration has to be accompanied by a fiscal integration.

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See also:

Bubble; Chartalism; Currency crisis; Euro-area crisis; European monetary union; Housing bubble; Impossible trinity; Lender of last resort; Triffin dilemma.

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Original sin

"Original sin" refers to the inability of many emerging and developing economies to borrow abroad in their own currency, and represents one of the major factors of their financial fragility. It negatively impacts these economies while putting them at financial risk by creating a currency mismatch between their revenues collected in local currency and the financing of their activities in a foreign currency (mainly the euro and the US dollar). At issue also is a larger maturity mismatch, because more projects now have therefore to be financed by short-term loans.

Original sin shows well the asymmetry embedded in the current international monetary system. While it is never a problem for the dominant international currency issuer (the United States), and is of limited concern for some industrialized economies (the euro area, United Kingdom, Japan, Switzerland), original sin is a significant problem for peripheral economies, which cannot borrow abroad in their own currency.

The metaphor of the original sin was first coined by Eichengreen and Hausmann (1999). In a celebrated article, co-written with Panizza (see Eichengreen et al., 2002), they abandoned what they used to call the "domestic" component of the original sin; that is, a situation in which the domestic currency cannot be used to borrow long-term because of high-level domestic risks. They claim that weaknesses in national macroeconomic policies and institutions are not statistically related to original sin and found that country size is the only statistically robust determinant of original sin. Several measures of original sin (OSIN indexes) were developed in order to assess more precisely its intensity, determinants and impacts.

Other parameters can influence original sin, such as international transaction costs, network externalities, global capital-market imperfections, monetary credibility (if the monetary and fiscal authorities are thought to be inflation-prone, foreign investors will lend only in foreign currency), the exchange-rate regime (fixed exchange rates in emerging economies are the main reason of liability dollarization), the level of the public debt burden, and the size of the investor base.

Some have argued, however, that the original sin literature is missing some other important determinants such as the export-to-GDP ratio, holdings of international reserves and foreign assets, the depth and importance of local bond markets, and the presence of foreign banks lending in local currency (rather than cross-border lending). Overall, debt composition and debt ownership need to be better taken into account (Dell'Erba et al., 2013).

Recent empirical studies assess the impact of original sin at the firm level versus the country level. For instance, Brei and Charpe (2012) investigate five episodes of currency collapse from the perspective of non-financial firms operating in Argentina, Brazil and Mexico. At the firm level, they find that the most affected firms are those with high levels of unhedged foreign-currency debt. At the country level, Argentina, Brazil and Mexico display three contrasting examples. Argentina has a large currency mismatch, contrary to Brazil, while Mexico occupies an intermediate position.

There has been considerable debate on how to rid countries of original sin. One approach is to allow countries to accumulate large and expensive foreign reserves as a way of protecting themselves from potentially destabilizing financial consequences. Another approach, endorsed in November 2011 by the G20, involves a multilateral action plan to support the development of local currency bond markets in the hope that this would overcome the difficulties encountered by emerging-market borrowers (International Monetary Fund et al., 2013).

A few emerging countries have tried to get rid of original sin by unilaterally developing local-currency-denominated bonds at the international level. For instance, in September 2005, the first large long-term debt issuance in domestic currency was launched by the Brazilian government. It was well received by foreign investors and expectations were high that the first Latin American economy was on its way to overcoming its original sin. However, it may not have been as successful as believed, if we consider economic and financial indicators related to the acceptance, spread and currency denomination of Brazilian sovereign bonds issued in reals.

A more promising multilateral solution is to promote a new regional financial architecture. One of the major ambitions of the Bank of the South, established in 2009 in South America, was precisely to break away from depending on the US dollar and increase mutual regional sources of finance. By strengthening the regional bond markets, it may reduce the burden of original sin (Camara-Neto and Vernengo, 2010).

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See also:

Bretton Woods regime; Dollar hegemony; Dollarization; Financial crisis; Financial instability.

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Output gap

The output gap is a measure of the difference between the current and the potential output of a country's economy. According to the standard methodology proposed by the International Monetary Fund, this gap is defined as the percentage deviation of output from its potential, which means that a positive (negative) output gap occurs when current output is above (below) potential output. As the latter is not observable, measuring the output gap becomes an issue.

Potential output and output gaps are central concepts for macroeconomic analysis in the short and long run, despite the fact that they are not observable variables and are hard to measure. Potential output is associated with a sustainable path for output in the long run (economic growth with low inflation), whereas the output gap relates to excess demand or supply and, thus, to short-term inflationary or deflationary pressures. When the output gap is positive (that is, GDP is above its potential), inflationary pressures tend to appear owing to excess of aggregate demand. In turn, a decline in measured inflation rates tends to occur when the output gap is negative.

The output gap is thus an important indicator of business cycles and inflationary pressures, and is useful for guiding macroeconomic policies. As regards monetary policy, central banks around the world adopt (explicitly or not) reaction functions *à la* Taylor-rule, taking into account the deviation of inflation from its target and the deviation of current from potential output (that is, the output gap). In the case of fiscal policy, estimating potential output and the output gap is important to assessing the sustainability of budget deficits as well as related demand pressures.

The definition of potential output is not unanimous in the literature and several definitions have been proposed and used in empirical works. From a macroeconomic point of view, one of the most recurrent definitions was given by Okun (1962), according to whose "law" potential output is the output at full employment.

Okun's law relates changes in output to changes in unemployment. When potential output is defined as the non-accelerating inflation level of output, there is a rate of unemployment associated with potential output that is consistent with a stable inflation rate. This is the so-called Non-Accelerating Inflation Rate of Unemployment (NAIRU). Thus, deviations of the actual unemployment rate from the NAIRU are related to deviations of

output from its potential level. The NAIRU is frequently associated in the literature with the concept of natural or structural unemployment, by being the component of unemployment dependent on institutional and structural characteristics of the economy, and not related to cyclical components of it.

The concept of the natural rate of unemployment, in turn, comes from the accelerationist version of the Phillips curve (Phelps, 1967; Friedman, 1968). In this view, the bargaining power of workers depends on institutional factors in the labour market and on the measured unemployment rate. The higher the rate of unemployment, the lower is the increase in nominal wages and the lower is cost-pushed inflation. Thus, there is a trade-off between changes in inflation rates and changes in unemployment rates, and the natural rate of unemployment is taken to be the rate associated with a stable rate of inflation.

The NAIRU and the natural rate of unemployment are not necessarily the same in the short run, as the former may deviate from the latter in cases of large and persistent shocks in the labour market. However, the NAIRU is in general taken as the empirical counterpart of the natural rate of unemployment in studies about potential output.

As mentioned, potential output and the output gap are not observable variables and thus cannot be measured. They can only be estimated, and there are several methodologies for doing so. Some of the most used methods are the Hodrick–Prescott (HP) filter, the Beveridge–Nelson decomposition, the Band–Pass filter, the Kalman filter, and the production function approach, among others (see Cerra and Saxena, 2000).

In general, estimating potential output and the output gap involves the assumption that output may be decomposed into a long-run trend and a short-run cyclical component. In this case, the trend is taken to represent the economy's potential output and the cycle is interpreted as a measure of the output gap. Moreover, "it is implicit in the estimation of trend that the 'average' level of output reflects supply-side conditions, and that this 'average' level can be taken as reflecting some form of supply-side equilibrium. Further, it is implicit that the level of demand does not influence the 'average' level of output" (Arestis and Sawyer, 2008, p. 765). Therefore, the main issues associated with the estimation of the output gap relate to the problems involved with estimating (cycle-free) trends.

In other words, regardless of the method used, estimating potential output and the output gap is subject to considerable uncertainty, because the underlying relationships in the economic system often change, owing to the interdependence between economic growth and business cycles. In particular, from a Keynesian perspective, one can summarize the relations between short-run cycles and long-run trends according to two propositions: (i) current developments of the economy affect its long-run trajectory, that is, the economic system presents path dependence; and (ii) aggregate demand matters both in the short run and in the long run.

Once the effects of short-run demand shocks on long-run output trends are taken into account, the output gap cannot be estimated regardless of current output. This means that the output gap becomes endogenous to current developments of the economy. This result is very important in terms of its policy implications, particularly regarding monetary policy. In this case, if the central bank is to determine changes in the interest rate based on some sort of reaction function *à la* Taylor-rule, the influence of policy – via aggregate demand – on potential output should be taken into account.

GILBERTO LIBANIO AND MARCO FLÁVIO RESENDE

See also:

Monetary policy indicators; Monetary policy objectives; Phillips curve; Taylor rule.

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Outright Monetary Transactions

The European Central Bank (ECB) announced its Outright Monetary Transactions (OMTs) programme in the summer of 2012, amid renewed financial tensions in the euro area. The main characteristic of this programme to buy government bonds is that it is potentially unlimited (there are no *ex-ante* limits) but is conditioned upon European financial assistance, via either the European Financial Stability Facility (EFSF) or the European Stability Mechanism (ESM), including "strict conditionality".

While this ECB programme has yet to be used at the time of writing (May 2013), its sole announcement contributed to a sharp decrease in public debt tensions in the euro area (especially for countries under market pressure, such as Spain and Italy) and more generally to a strong improvement of market conditions. The setting-up of OMTs came in a three-step sequence, from late July 2012 to early September 2012.

First, on 26 July 2012, Mario Draghi, President of the ECB, gave a seminal speech in London, stating that "[w]ithin our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough" (European Central Bank, 2012a). Draghi also hinted at future OMTs, arguing for the first time that the mandate of the ECB included premia charged on government borrowings, if these premia were related to a "risk of convertibility" (meaning the pricing of the risk that any euro-area country leaves the monetary union).

Second, on 2 August 2012, in the introductory statement to the press conference following its meeting, the Governing Council of the ECB confirmed Draghi's strong words from the end of July 2012, and laid out the main principle of OMTs: "Risk premia that are related to fears of the reversibility of the euro are unacceptable, and they need to be addressed in a fundamental manner. The euro is irreversible" (European Central Bank, 2012b). OMTs, made on the secondary government bond market, would be conditional to "the fulfilment by the EFSF/ESM of their role" and "of a size adequate to reach its objective" (*ibid.*). No formal decision was taken by the ECB in August 2012, but "guidance" was given to the appropriate ECB committees to work on the OMTs programme. This was accepted by quasi-unanimous approval within the ECB Governing Council, as there was only one exception (as Draghi implicitly recognized): the President of the

German Bundesbank, Jens Weidmann, who raised his voice against the adoption of such a “bail-out” programme for “peripheral” countries within the euro area.

Third, on 6 September 2012, the Governing Council of the ECB formally decided the main technical features of OMTs. In addition to the features already noted, it also stated, *inter alia*, that the International Monetary Fund’s involvement should be sought (for the design and monitoring of the measures related to the required EFSF/ESM programme), that the buying of government bonds would concentrate on maturities of “between one and three years”, that the Eurosystem accepted to be considered at the same level as other creditors for the bonds purchased, that the transactions would be “fully sterilized”, and that holdings of securities would be published on a weekly basis (with a breakdown by country on a monthly basis) (see European Central Bank, 2012d). Also, the Securities Market Programme (SMP), launched in May 2010 but known to be limited, was discontinued (see European Central Bank, 2012c, 2012d).

The announcement of OMTs undoubtedly marked a turning point in the response of the ECB to the euro-area crisis. Indeed, the ECB is forbidden by its statutes and European treaties to finance governments (“monetary financing” prohibition), and its lack of intervention in euro-area sovereign bond markets (contrary to all major central banks) was one of the main factors behind the second phase of the financial crisis in euroland (the “sovereign debt crisis”), allowing the sharp increase of spreads on sovereign bonds between “core” and “peripheral” countries. Even if this can be partly explained by the institutional specificities of the euro area (which has one central bank, but 17 national fiscal authorities), this set-up has been proven deeply unstable.

OMTs thus go some way towards solving this institutional problem, with the ECB potentially ready to assume a role closer to a “lender of last resort to governments” in the euro area. It remains to be seen, however, if the sole possibility of an activation of OMTs will suffice to ensure a long-lasting stabilization of government bond markets in the euro area, and, if not, whether the interventions implied by an activation of OMTs could be fully accepted, both within the ECB and by euro-area member countries. Independently of the debate on the adequacy of economic policy orientations across the euro area, it seems that the ECB interventions will remain precarious until the euro area evolves towards a true banking and fiscal (in the sense of a euro-area budget and debt) union, which could legitimize the stabilizing role of the ECB in the relevant government bond markets.

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See also:

Draghi, Mario; Euro-area crisis; European Central Bank; Forward guidance; International Monetary Fund; Lender of last resort; Open-mouth operations; Sterilization.

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¹ The views expressed herein are the author’s and do not necessarily represent the views of the French Treasury.

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Padoa-Schioppa, Tommaso

Tommaso Padoa-Schioppa (1940–2010) has been one of the most influential Italian economists over the last 40 years. Trained at the Bocconi University in Milan and later at the Massachusetts Institute of Technology with Franco Modigliani, he spent most of his professional life as a central banker. He was first hired at the Bank of Italy in 1968, where he remained until 1997, although during this period he also spent some time detached at the Italian Treasury and nearly five years (1979–83) as Director General of Economic and Financial Affairs at the European Commission in Brussels (see Maes, 2013). Later on, Padoa-Schioppa returned to the Bank of Italy, as Vice-Director General from 1984 to 1997. During that period, he also served as a member of the Delors Committee, which relaunched the monetary integration process in 1989, and took an active part in the technical and political processes that led to the adoption of a single currency in several member countries of the European Union (EU). From 1998 to 2005, he was a member of the Executive Board of the European Central Bank (ECB).

His main aim during the 1990s was to contribute to the establishment of the ECB and the introduction of the euro. In this attempt, one of the leading concepts he had used since 1982 was the “inconsistent quartet” (Padoa-Schioppa, 1992, p. 38). Following the Mundell–Fleming trilemma of economic policy, he argued that in a multi-country framework it is impossible to have, at the same time, (i) perfect mobility of production factors (capital and labour), (ii) perfect mobility of final goods (a single market), (iii) fixed exchange rates, and (iv) autonomous national fiscal and monetary policies.

There is abundant evidence (see, for instance, Padoa-Schioppa, 1992, 2001, 2004a, 2004b) that Padoa-Schioppa was well aware that, when financial capital was given full mobility across the EU (in 1990) and the Single Market was established (in 1992), the last two items of the “inconsistent quartet” would be put under pressure. Pursuing a monetary union would eventually lead to a pressing need to share a common strategy of economic policy among euro-area member states, eventually leading to a European government. This is what he also tried to pursue as a member of the Executive Board of the ECB, keeping a strong commitment to further deepening of the European integration process.

Padoa-Schioppa’s concept of economic policy was guided by a profound awareness of the crucial role of constitutional frameworks, the central bank being a fundamental actor in policy-making. For him, a central banker is called to act within a set of strict rules in order to gain credibility, but Padoa-Schioppa systematically recalled the need also to discern situations in which a certain degree of discretionary power is required.

Padoa-Schioppa has written extensively on the role of central banks and monetary policy. His most interesting work on this topic is probably *The Euro and its Central Bank: Getting United after the Union* (Padoa-Schioppa, 2004a).

Padoa-Schioppa’s view of economics can hardly be included within a precise school of economic thought. He was pragmatic and convinced that a central banker cannot ignore the dominant theoretical paradigm, because this helps to understand and guide market expectations. He always underlined the main faults of the prevailing paradigm, but also

the shortcomings of any other competing analytical apparatus. For example, he often stressed how the use of monetary or inflation targets are the result of prevailing forces between academics and policy makers, and that central bankers adapt their strategies in order to communicate and act according to the changing theoretical environment and expectations. Padoa-Schioppa was clearly in favour, for example, of a wider range of monetary indicators than M3, in order to take into account other monetary and credit aggregates. Furthermore, he was clearly in favour of also targeting “core inflation”, rather than (harmonized) CPI inflation only (Padoa-Schioppa, 2004a, pp. 106–10).

Despite his pluralistic attitude, it is rather evident that Padoa-Schioppa believed in the non-neutrality of money over the short run (that is to say, an unexpected impulse of monetary policy impacts the “real” economy) and in money neutrality over the longer run. For him, rules are therefore important as they help gain credibility among economic agents and stabilize expectations, but discretion is crucial to the preservation of the role of monetary policy in critical situations. Fine-tuning is not an option for a central banker, but constraints should never imply giving up all the room for manoeuvre in monetary policy-making. Only a diversified approach to economic modelling can help a central bank reach its goals effectively (Padoa-Schioppa, 2004a, p. 115).

Padoa-Schioppa was also dramatically worried about two problems of the euro area, which he deemed would acquire increasing importance over a low rate of inflation: weak GDP growth rates and high unemployment rates. He always recalled that a central bank alone cannot do much to achieve these goals, but he also suggested that the ECB should be ready to support the greatest non-inflationary growth rate of GDP, even if this means abandoning a 2 per cent inflation target (Padoa-Schioppa, 2004a, pp. 231–3).

As regards the shape and structure of a central bank, Padoa-Schioppa (2004a, p. 235) firmly believed in the public “monopoly”. When explaining the three possible evolutions of the Eurosystem, he argued in favour of a top-down rationalization of banking, financial and supervisory functions centralized at the ECB, being sceptical about the efficacy of both the maintenance of a two-tier (national and supranational) system and the pursuit of a bottom-up rationalization brought about by explicit competition among national central banks.

Another aspect worth underlining is the external role of the central bank. Padoa-Schioppa was convinced that the ECB should take an active stance in exchange-rate policy, not necessarily targeted at a specific behaviour towards bilateral parities, but aiming at the emergence of an international regime less characterized by the shortfalls of global imbalances owing to the pivotal role of the US dollar.

Nevertheless, Padoa-Schioppa was perfectly aware that such a role can be played only by a more robust European institutional structure, and this is one of the reasons why he strongly advocated the transformation of the euro area into a political federation.

FABIO MASINI

See also:

Bank of Italy; Core inflation; Dollar hegemony; Euro-area crisis; European Central Bank; European monetary union; Impossible trinity; Inflation targeting; Monetary aggregates; Money neutrality; Triffin dilemma.

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Patinkin, Don

Don Patinkin (1922–95) is known for his contributions to monetary theory, and in particular for his attempt to integrate money and value within the neo-Walrasian general equilibrium framework in a manner consistent with the quantity theory of money (QTM). His work culminated in the publication of *Money, Interest, and Prices* (Patinkin, 1956 [1989], henceforth *MIP*), which set the stage for monetary debates and developments in mainstream economics throughout the following two decades.

Patinkin argued that the way neoclassical theory (from Walras to Cassel and Pigou) integrated money into value theory was by appending a QTM equation to a general equilibrium system of excess demand functions for commodities (Patinkin, 1951, 1972 [1981]). The excess demand functions satisfied the homogeneity postulate (homogeneity of degree zero in money prices) as these depended only on relative prices and endowments. On the contrary, the QTM equation was assumed to be homogeneous of degree one in money and prices.

According to the QTM a change in the money supply causes, in the long run, an equiproportional change in the absolute price level. This is inconsistent, however, with the specification of excess demands, because the latter depend on relative prices, which remain constant when, as a result of the increase in money supply, all individual prices change proportionately. Hence, Patinkin concluded that the dichotomy was "invalid", as it led to contradictory implications about the determinacy or the stability of the absolute price level.

Patinkin's solution involved specifying individual and market (excess) demand functions for commodities as functions of relative prices, endowments, and also of the real value of initial money holdings (that is, real cash balances). As a result, an increase in the quantity of money, by increasing real money holdings, affects the demand for commodities, "just as any other increase in wealth" (Patinkin, 1956 [1989], p. 20). It is precisely on the real-balance effect – which he had earlier termed the Pigou effect (Patinkin, 1948, 1987) – that the QTM depends for the inflationary impact of an increase in the quantity of money (Patinkin, 1956 [1989], p. 173).

The implications of the real-balance effect were worked out by Patinkin in the specification of a four-market model (bonds, commodities, labour, and outside money) that included Walras's law, perfect competition, absence of money illusion and of distribution effects, and full employment. On these assumptions, Patinkin showed that the real-balance effect maintains the stability of the economic system by acting as an equilibrating force in the commodity and bond markets. In the long run, an increase in the money supply causes an equiproportionate increase in the price level, leaving real variables unaltered, thus validating the QTM neutrality postulate (Patinkin, 1956 [1989], pp. 236–44).

As a further development, Patinkin's *MIP* also introduced temporary equilibrium with

quantity rationing (Patinkin, 1956 [1989], ch. 13), which is essential to the neo-Walrasian interpretation of Keynes's *General Theory* (1936) and of involuntary unemployment as disequilibrium macroeconomics (Clower, 1965 [1986]; Barro and Grossman, 1971).

Patinkin's *MIP* led to an extensive debate in monetary theory and macroeconomics during the next two decades. In particular, it opened the debate about the role of money in neo-Walrasian economics and the different varieties of general equilibrium. Hahn (1965 [1984]) and later on Clower (1967 [1986]) argued that Patinkin's solution to the "invalid dichotomy" involved the possibility of barter and non-barter equilibria and that there was no reason in Patinkin's solution that justified the need for agents to make transactions on the basis of "money" (considered mainly as a medium of exchange). This led Clower to introduce a finance constraint, which captures the function of money as a means of exchange, and which is a key feature of many modern macroeconomic models.

At a closer inspection, Patinkin's solution to the invalid dichotomy reflects a more important limitation of his approach. In order to render coherent the integration of money and value theory, Patinkin assumed that (i) all agents in a given market are endowed with the same purchasing power and must spend the same fraction of wealth (real balances) on the available set of goods; and that (ii) the marginal propensity to spend out of wealth (real balances) and income on each good is the same for all individuals in the same market. In other words, Patinkin's solution assumed that agents had linear Engel curves passing through the origin and thus the solution to the invalid dichotomy required the assumption that the economy consists of a single agent (Benetti, 1990). This calls into question the very need of coordinating generalized exchange that gave rise to general equilibrium theory.

Alternative attempts at integrating money and value theory within a neo-Walrasian framework such as that of the overlapping generations model (OGM) face similar limitations (Wallace, 1980). In fact, the OGM can be interpreted as consisting of a single agent economy that transfers money through time.

Patinkin made contributions in other areas, such as the history of economic thought focusing on the work of John Maynard Keynes and the Chicago School of Economics (Patinkin, 1981, 1982). Patinkin defended the originality of Keynes's theory of effective demand against the claims that he had been anticipated by the Swedish School of Economics and also by Michał Kalecki. Regarding the Chicago School of Economics, Patinkin upheld the view that Friedman's restatement of the QTM in terms of the demand for money function is really a modified version of the Keynesian liquidity preference.

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See also:

Classical dichotomy; Money illusion; Money supply; Quantity theory of money; Real-balance effect.

¹ The opinions here expressed are those of the author and may not coincide with those of the institutions with which he is affiliated.

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People's Bank of China

The People's Bank of China (PBoC) was established in 1948 through a merger of Huabei Bank, Beihai Bank and Xibei Farmer Bank. Since then, its organizational structure and its functions have evolved in line with the political and economic changes China went through. Between 1950 and 1978, the PBoC was the only bank in the People's Republic of China, performing the typical functions of a central bank as well as those of commercial banks. During this period, the Bank of China – the oldest bank in China, founded in 1912 – was subordinated to the PBoC.

Following the economic reforms initiated in the late 1970s, the PBoC's regular commercial banking activities passed to four independent State-owned banks (Sun, 2013). In September 1983, the State Council formally designated the PBoC as the central bank of China. The Law of the People's Republic of China on the People's Bank of China, adopted in 1995 by the third plenum of the eighth National People's Congress, legally confirmed the central bank status of the PBoC. This law was amended in 2003, when the main functions of the PBoC were defined. These were typical central banking activities, such as formulating and implementing monetary policy, issuing the domestic currency (the renminbi), holding gold and foreign-exchange reserves, guiding exchange-rate policy, regulating financial markets and preventing systemic financial risks in order to guarantee financial stability, ensuring normal operation of the payment and settlement systems, among other things.

It should be noted that the PBoC is not independent and needs the permission of the State Council to change its policies. In particular, monetary policy is formulated by a Monetary Policy Committee, a consultative body that has quarterly meetings and whose composition is defined by the State Council.

The objective of China's monetary policy – as stated on the PBoC's website – is

“to maintain the stability of the value of the currency and thereby promote economic growth”. In practice, the State Council has charged the PBoC with the broad goals of price stability, employment growth, external balance and financial stability (Conway et al., 2010). Although price stability may be seen as the primary mandate of the PBoC, the bank has also attached great importance to economic growth. More specifically, monetary policy is formulated in line with yearly GDP growth targets, defined by the government in order to absorb excess labour supply and prevent growing unemployment rates (Sun, 2013). In addition, the PBoC actively intervenes in the foreign-exchange market aiming to keep the domestic currency exchange rate within predetermined floating limits. As Sun (ibid., p. 7) points out, “[t]he current managed floating exchange rate regime in China allows a daily movement up to ± 1 percent in bilateral exchange rates. Under this regime, the PBoC is thus committed to stepping in the foreign exchange market to buy or sell foreign currencies whenever the exchange rate hits the bound”.

In order to achieve its multiple goals, the PBoC uses at its discretion different policy tools, such as open-market operations (OMOs), changes in reserve-requirement ratios, and the setting of various interest rates, such as the central bank lending rate and the rediscount rate. Also, monetary policy includes less conventional measures, such as direct credit at subsidized interest rates for particular sectors or regions, and the so-called “window guidance” – when the PBoC influences the structure of bank lending via regular meetings with commercial banks. Furthermore, its operational procedures vary over time, so that its actions cannot be described by a time-invariant reaction function.

China’s monetary-policy strategy has historically been based on monetary targeting, via the use of quantity controls on bank lending and other instruments such as reserve requirements. The PBoC sets targets for the growth rates of M2 and bank credit that are consistent with its policy objectives, and has a number of instruments at its disposal to achieve its money supply and credit growth targets. OMOs and changes in minimum reserve requirements for commercial banks have been the main tools with which the PBoC affects the money supply and market conditions in general (Conway et al., 2010), although direct discretionary lending and window guidance are also relevant in order to achieve its monetary-policy goals.

In addition to the use of quantity-based instruments to control liquidity, the PBoC manages a range of interest rates in the economy, by setting benchmark interest rates for bank lending and deposits of various maturities, while commercial banks are allowed to adjust their interest rates around the benchmark within a limited band. The PBoC also sets the rediscount rate, and interest rates paid on required and excess reserves of commercial banks deposited at the central bank. According to Conway et al. (2010, p. 7), “in comparison to OMOs and required reserves, policy interest rates play a secondary role in monetary policy implementation and the PBoC changes them less frequently and typically by a smaller amount than central banks elsewhere”.

China’s monetary policy may at times be criticized for being “too discretionary”, which may increase uncertainty in the market. Also, one could argue that the type of intervention performed by the PBoC – including indirect pressure over commercial banks about their lending policies – would not be feasible under a democracy.

In any case, rapid financial innovation and financial sector liberalizing reforms – particularly after the 2008–09 global financial crisis – have been changing the sensitivity

of money demand to income and interest rates, which reduces the usefulness and efficacy of monetary targeting. This result suggests the need for the PBoC to adjust its policies towards more price-based tools such as interest rates.

Overall, the PBoC sets monetary policy in a discretionary manner, in line with broad economic goals defined by the government, including both real and nominal objectives. In other words, a discretionary monetary policy and a competitive exchange-rate policy are instrumental to stable prices, GDP growth and structural change in the Chinese economy.

GILBERTO LIBANIO

See also:

Financial instability; Interest rates setting; Monetary targeting; Money creation and economic growth; Open-market operations; Reserve requirements; Rules versus discretion; Settlement system.

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Phillips curve

The Phillips curve is the idea that (wage or price) inflation is positively related to economic activity and to the expected rate of inflation. The Phillips curve takes its name from Alban William Phillips, a New-Zealand-born economist. Phillips (1954) made the theoretical postulate that price inflation was a positive function of output; whereas in Phillips (1958) he produced an empirical negative relationship (observed for the United Kingdom) between wage inflation and the rate of unemployment. Following Friedman (1968) and Phelps (1967), the expectations-augmented Phillips curve was developed. It can be written as follows:

$$p = p^e + f(y - y^*)$$

where p is the rate of inflation, p^e is the expected rate of inflation, y is output and y^* is potential output (both in log form), and the difference between output and potential output is the output gap. This formulation is now the most widely used, and appears in "new consensus macroeconomic" models, which are closely associated with a New-Keynesian Phillips curve in which the coefficient on the expected rate of inflation is near to but different from unity (on "new consensus macroeconomic" models, see for example Arestis, 2007).

In monetary policy debates, causation is taken to run from right to left in the above equation, though other formulations postulate that the difference between actual and expected inflation rates influences supply decisions (and hence the level of output).

The significant features of the Phillips curve are as follows:

- (1) There is a “knife edge” accelerationist perspective, in that output above potential output leads to inflation faster than expected. As expectations on inflation adjust to experience, the expected rate of inflation increases, and the actual rate of inflation becomes even higher. Hence, output maintained above potential output leads to rising inflation rates.
- (2) There is a supply-side equilibrium for which the rate of inflation is constant, where actual and expected inflation rates are equal. In the wage-inflation formulation, this would be the “natural rate of unemployment” (Friedman, 1968); in the formulation above, this would be a zero output gap. This is a classical dichotomy whereby the level of output may be influenced in the short run by the level of demand but not in the long run, and where the rate of inflation is set by monetary policy.
- (3) Expectations of inflation have a particularly important influence on actual inflation rates. There have been many views on how expectations are formed, from adaptive expectations under which expectations are formed by experience of inflation to a “rational expectations” perspective under which expectations are formed by reference to a model of the economy and its forecasts on inflation rates.
- (4) The notion that the Phillips curve represented a trade-off (in its original formulation) between inflation and unemployment rates was evident in much of the early literature on this subject matter: lower unemployment rates came at the expense of higher rates of inflation. The “natural rate” view argued that there was no trade-off: lower unemployment rates could only be sustained with ever-rising rates of inflation, and a constant rate of inflation required unemployment to be at its “natural rate”. However, the idea that lower economic activity (higher unemployment rates) can bring lower rates of inflation remains part of the monetary policy literature. Furthermore, the idea that politicians will be tempted to lower unemployment rates and raise economic activity in order for them to buy electoral popularity, which will then bring (with a lag) higher inflation rates, has remained a significant component in the arguments for an independent central bank.

Monetary policy became associated with the control of inflation from the 1970s onwards, invoking the Phillips curve mechanism. The monetarist onslaught of the 1980s fitted in here with the identification of money supply growth with the rate of inflation, and the control of the former with control of the latter. A further twist was the notion that announcements of money supply targets could influence expectations of inflation. A credibility argument emerged: if a central bank could establish that it was committed to a specified growth rate of the money supply, then expectations on inflation could well adjust accordingly, and the rate of inflation itself would also adjust. The failures of the 1980s on the part of central banks to achieve money supply targets soon discredited this monetarist regime. “Inflation targeting”, defined as the adoption of an inflation target, which is to be achieved by an “independent” (of political and democratic control) central bank using its policy interest rates as the instrument, emerged during the 1990s as the dominant approach to monetary policy.

The Phillips curve was originally an empirical observation on the wage inflation–unemployment rate relationship, which has moved to being a theory-driven idea about the price inflation–output gap relationship. However, as argued by Sawyer (2009), the Phillips curve has no well-grounded theoretical basis: this argument can be encapsulated

in the observation that theorizing on pricing often derives a relationship between the level of prices (relative to costs) and the level of output, yet the Phillips curve relates the rate of change of prices (inflation) to the level of output (as the above equation shows, the Phillips curve relates the difference between inflation and expected inflation to the level of output).

Indeed, the Phillips curve has been strongly criticized in the literature. It is a single-equation, demand-driven approach to inflation. It does not readily capture cost pressures on inflation, nor does it capture wage–price spiral effects in which price inflation pushes up wage inflation, and wage inflation pushes up price inflation. It has a closed-economy perspective, and inflationary pressures from the global economy and movements in the exchange rate are not reflected in the Phillips curve. It also ignores any conflicts over income shares, which come to the fore in other explanations of the inflationary process.

MALCOLM SAWYER

See also:

Central bank independence; Classical dichotomy; Inflation; Inflation targeting; Monetarism; Monetary policy instruments; Monetary targeting; Money illusion; Money neutrality; Output gap.

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Policy rates of interest

The “policy rate of interest” is the operating target of a central bank that is used in the conduct of daily monetary policy, and is the variable that the central bank can control directly as it aims to achieve its intermediate targets, or objectives, such as price stability, financial stability and full employment.

In the United States, the policy rate of interest is the federal funds rate, and is the rate at which banks lend reserve balances to each other overnight. In the United Kingdom, the policy rate of interest is the bank rate and is the rate at which reserve balances with the Bank of England are remunerated.

The setting of the policy rate of interest involves, first and foremost, an act on the part of the central bank to “signal” its policy stance to the markets (Borio and Disyatat, 2009), which usually involves an announcement of a policy rate, or a change to the existing rate, within a framework of well-defined monetary policy communication. Liquidity management operations are subsequently used to prevent deviations of the actual policy rate, or a chosen short-term market rate of interest that allows the central bank to gauge

the success of its policies, from the desired policy rate (*ibid.*), although the credibility of most central banks' monetary policy means that an announcement is generally sufficient to immediately move the policy rate to its target and there is even evidence that such movement frequently occurs before an announcement is made, owing to the so-called "anticipation effect" (Carpenter and Demiralp, 2006).

Once the policy target has been announced, there are three general approaches that a central bank can adopt to implement its monetary policy stance. The first is known as the channel (or the corridor) system, and has been adopted by the Bank of Canada, among others. Under this system, a central bank will run one facility under which it will satisfy all demand to borrow funds at a pre-defined interest rate, thereby setting the upper boundary of the corridor, while simultaneously remunerating reserves (effectively funds lent to the central bank by the banking sector) at a different interest rate, which defines the floor of the corridor. Both the floor and the ceiling of this corridor can be adjusted to ensure that the announced policy rate of interest remains at the desired level within the bounds of the channel.

The second approach involves the remuneration of reserves at the desired policy rate of interest, which equates the opportunity cost of holding reserves to zero and ensures that the policy rate remains independent of the quantity of reserves that the central bank chooses to provide to the banking sector (Borio and Disyatat, 2009). As of 2008, the US Federal Reserve has employed this approach in its conduct of daily monetary policy.

The third approach involves overnight lending by the central bank to satisfy all banks' demand at the announced policy rate of interest. Given that in this case bank reserves are either not remunerated at all or pay a rate below the policy rate of interest, the central bank must use open-market operations to ensure an appropriate level of bank reserves within the banking sector; an insufficient or an excessive quantity of reserves will cause volatility of the operational target rate of interest. The European Central Bank has adopted this approach in its management of daily monetary policy (Williamson, 2011).

The classical exposition of the conduct of daily monetary policy, present to this day in some economics textbooks, envisages a money supply and a money demand curve, the former of which the monetary authorities manipulate in order to move the prevailing rate of interest to the desired level. Contrary to this presentation, the conduct of daily monetary policy by the majority of central banks in the world today does not involve any form of targeting of monetary aggregates, not because monetary aggregates prove to be difficult and impractical targets, as is frequently argued in policy circles, but because the endogenous nature of modern money makes such targeting an impossibility (see for example Lavoie, 1984, for a theoretical discussion of the implications of endogenous money; and Carpenter and Demiralp, 2012, for empirical evidence of its implications for monetary policy).

It is thus bank reserves, and not the supply of base money, which are the key to a central bank's control of the policy rate of interest. While the central bank has, undoubtedly, control over the policy rate as explained above, this rate is not locked in any pre-defined relationship with market interest rates, such as retail or mortgage rates, which are of fundamental importance to the smooth functioning of financial markets and the economy as a whole.

The determinants of the relationship between the policy rate of interest and prevailing market rates of interest, as well as the relationship between the policy rate and the term

structure of interest rates, are the subject of a rich body of literature in financial theory as well as numerous empirical investigations. Further controversy on the subject can be found in post-Keynesian discussions that question the fundamental validity of the “New Consensus” approach to modern monetary policy, with its predominant concern with inflation targeting and complete reliance on monetary policy to fine-tune the economy via the use of short-term policy rates of interest. Post-Keynesians offer a number of alternatives (see the discussion in Rochon and Setterfield, 2011), with the most ardent dissenters from the prevailing monetary policy framework arguing against the use of a policy rate of interest and for a greater reliance on fiscal policy in the pursuit of macro-economic objectives.

VERA DIANOVA

See also:

Central bank credibility; Corridor and floor systems; Effective lower bound; Endogenous money; European Central Bank; Federal Open Market Committee; Forward guidance; Inflation targeting; Monetary aggregates; Monetary policy instruments; Monetary policy objectives; Negative rate of interest; Open-market operations; Reserve requirements; Zero interest-rate policy.

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Prebisch, Raúl

Raúl Prebisch (1901–86) was both an academic and a policy maker. As an academic, he is mostly known for his long-run analysis and diagnostic of the development problem of Latin America, which he fully stated in “The economic development of Latin America and some of its principal problems” (1950), also known as Prebisch’s “Manifiesto”. As a policy maker, his most significant contribution was in central banking. Prebisch began his career as a central banker in 1935, when he assumed the position of Director General of the then recently created central bank of Argentina. Prebisch himself drafted the project for the bank a year earlier (Dosman, 2008; Pérez Caldentey and Vernengo, 2012a).

The central bank of Argentina was conceived, along conventional lines, as an institution independent of the government and whose main objective was monetary and price stability. Prebisch thought that the central bank of Argentina could pursue a

leaning-against-the-wind policy by maintaining an adequate level of international reserves as a buffer against export shocks and sudden capital stops (Prebisch, 1991).

Under the force of events, Argentinean central bank policy evolved progressively towards a double objective: price and output stability. Both were also made dependent on the balance-of-payments position of Argentina. To comply with these objectives and improve the policy autonomy of the central bank, Prebisch proposed the use of several instruments including rediscount, dual exchange rates, imports permits, foreign-exchange controls, and capital account regulation (Prebisch, 1993; Pérez Caldentey and Vernengo, 2012b).

Prebisch's ideas on central banking were included in his book proposal entitled *Money and Economic Activity*, on which he began working in 1943, the year in which (as a result of a military coup) he lost his central bank appointment. In *Money and Economic Activity* (Prebisch, 1943), he argued that monetary and fiscal policies should have three main aims: (i) to attenuate the incidences of the abrupt changes in harvest conditions and the fluctuations in external prices and demand; (ii) to create the monetary conditions that stimulate the development and maintenance of full employment of the workforce; and (iii) to foster and support the highest possible rate of growth of economic activity.

Following his departure from the Central Bank of Argentina in 1943 and until 1948, Raúl Prebisch made use of his policy experience to participate, assist and promote banking reforms throughout Latin America. Prebisch's involvement benefited from the "good neighbour policy" adopted by the then President of the United States, Franklin Delano Roosevelt, towards Latin America. The "good neighbour policy" was based upon non-intervention and non-interference with the domestic affairs of Latin America. Eventually it evolved into a policy of active financial and economic cooperation (Helleiner, 2009).

As part of this policy, the United States provided technical assistance in monetary matters at the request of Latin American governments under the leadership of Robert Triffin. Triffin had met Prebisch in Mexico, and had a high regard for his work and experience as a central banker. In 1944, he invited Prebisch to participate in the American mission to reform the central bank and monetary system of Paraguay.

Triffin had similar views to those of Prebisch on the role of the central bank. Furthermore, Triffin's ideas were partly influenced by Prebisch's own experience as he himself recognized. Both understood that the functions of the central bank were not only limited to maintaining price stability and reacting to external shocks and balance-of-payments difficulties. Central banks also had to follow a countercyclical stance and promote domestic objectives including economic growth and employment. Triffin was in favour of economic planning, a managed economy, infant industry protection, and was also sympathetic to state guided industrialization (Triffin, 1947; Wallich and Triffin, 1953).

Consistently with these views, the proposal for the reform of the monetary system of Paraguay involved the introduction and use of countercyclical measures and the regulation of capital movements. It also involved exchange-rate controls, the adaptation of credit policy to meet the needs of production, and the promotion of sectoral development through the provision of public long-term funding.

Prebisch's participation and advisory services with other central banks of the Latin

American region, including Paraguay (1944), Guatemala (1945), the Dominican Republic (1946) and Venezuela (1948), were inspired by the Paraguayan experience.

By the time Prebisch had ended his Latin American central banking period, he had assigned a greater role to monetary policy in supporting economic growth and employment. Indeed, in 1948, a year prior to his joining the Economic Commission for Latin America and the Caribbean, Prebisch argued that the central bank should give a hierarchical priority to the objective of maintaining stable economic growth consistent with the maximum possible employment of productive factors. This was the most important objective of monetary policy. It was an overarching objective, which subsumed responding to external shocks, the accumulation of reserves for precautionary motives, and lender-of-last-resort functions.

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See also:

Capital controls; Central bank independence; International reserves; Lender of last resort; Monetary policy objectives; Optimal international currency reserves; Sudden stops; Triffin, Robert.

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Price-level targeting

The monetary policy strategy of price-level targeting (PLT) dates back in the literature to Marshall (1887), Wicksell (1898) and Fisher (1922), but has not been practised since the 1931–37 Swedish experience (see Berg and Jonung, 1999). Contrary to inflation targeting, with PLT the monetary policy target is not expressed in terms of inflation rates but of price levels (with the inflation rate being the percentage change in the relevant price level).

² The opinions here expressed are those of the author and may not coincide with those of the institutions with which he is affiliated.

Under inflation targeting, the central bank tries to return to the inflation target after a shock and neglects its permanent effect on the price level, contrary to PLT, where the central bank offsets the effect on the price level to return to the original price level. The PLT therefore has “memory”: periods of inflation (deflation) when the economy departs from the price-level target are compensated by periods of deflation (inflation), to revert to the price-level target. “Hybrid” PLT combines inflation and price-level targeting, while “flexible” PLT is an output-gap adjusted price-level target (Woodford, 2011).

According to the literature of the early 1990s, the benefits of PLT, compared to inflation targeting, concern lower uncertainty about the price level. In this regard, inflation targeting is supposed to cause uncertainty about the price level in the long run. Enhanced predictability of the price level improves agents’ calculations, and *in fine* social welfare. By the end of the 1990s, in New Keynesian forward-looking models PLT also ameliorates short-term macroeconomic stability. With a credible commitment to the price-level target, agents’ expectations are supposed to be anchored, thereby reducing both the impact of shocks on the economy and the trade-off between inflation variability and output variability (Taylor curve). Furthermore, agents are supposed to anticipate the policy reversion to the price-level target, and hence adjust their inflation expectations, thereby alleviating the cost of the comeback to the price-level target. Besides, as PLT anchors inflation expectations, it is the optimal strategy in cases of crisis and so is recommended for Japan (Eggertsson and Woodford, 2003). This can be explained with the simple Fisher’s formula for the real interest rate, r , as follows:

$$r = i - \pi^e \text{ with } \pi^e = (p - p^*)$$

where r is the difference between the nominal interest rate (i) and inflation expectations (π^e). During a crisis, π^e becomes negative and r increases while the central bank wants it to decrease. Because of its zero lower bound, i cannot decrease further: managing π^e with PLT becomes a solution. The underlying New Keynesian hypothesis is that π^e depends on the price-level gap; that is, the difference between the actual price level (p) and the price-level target (p^*). This alleged suitability to a zero lower bound environment explains why the number of papers with PLT in the title has increased in the EconLit database since 2008.

In the real world before the global financial crisis, the Swedish Riksbank was against PLT in its response to the Giavazzi–Mishkin report in 2006 (Riksbank, 2007), and so was the Bank of Canada (2006) for the renewal of the inflation target. Following the crisis, PLT was once again refuted in a November 2011 document for the renewal of the inflation target at the Bank of Canada (2011). PLT has currently declined because of its fragile assumptions, its potential-only benefits, but quasi certain costs.

As a first cost, PLT can increase macroeconomic instability. If the price-level target is 2 per cent and the rate of inflation is higher (3 per cent, for example), then a deflation must be targeted, up to say around -1 per cent, to return to the price-level target. This deflation, via drastic interest-rate variations, can lead to the so-called “instrument instability” problem disturbing the economy (Fischer, 1994). As stressed in the early 1990s literature, PLT also lacks robustness to supply shocks (oil shocks). Pushing the price level and output in the opposite direction, this type of shock implies that PLT amplifies

output volatility and deteriorates the Taylor curve. Other potential costs are in terms of communication to the public and transition towards PLT. Agents are used to inflation, not to the price level, meaning that the learning by agents could be long and the regime shift costly, notably according to the Riksbank (2007).

The short-term transition costs are large relative to the long-run benefits of PLT. In addition, playing with expectations is easy in theory but not in practice, as stressed by the Japanese experience of the liquidity trap in 1998–2005. One does not know how agents' expectations are really formed, because the idea of purely forward-looking expectations underlying the efficiency of PLT is a heroic hypothesis. Furthermore, imperfect knowledge of agents' expectations suggests that the credibility of the commitment to the price-level target is not automatic. Expectations could compromise PLT efficiency (Bank of Canada, 2011). Besides, if wages are sticky, especially during a crisis, then the cost of reverting to the price-level target increases. More generally, during the “Great Moderation” PLT was dismissed by central bankers who believed in inflation targeting efficiency and were considering PLT as just a theoretical proposal largely untested in practice (Kahn, 2009). During the global financial crisis that erupted in 2008, in questionnaires sent to central bankers PLT remained unpopular (Betbèze et al., 2011).

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See also:

Central bank credibility; Credibility and reputation; Effective lower bound; Financial crisis; Fisher effect; Inflation; Inflation measurement; Inflation targeting; Liquidity trap; Monetary targeting; Output gap; Taylor rule.

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Quantitative easing

Quantitative easing (often termed QE) has been an internationally important form of unconventional monetary policy since its implementation by several central banks in response to the Great Recession of 2007–09. Central bankers that had lowered their key policy rates of interest to nearly zero (the effective lower bound) but still wished to provide additional monetary policy stimulus took actions to increase the volume of base money. Their expressed hope was that this QE would boost total spending and thereby raise actual output closer to potential output, shrinking the output gap.

QE differs from traditional open-market operations in several respects including that the scale of intervention is vastly greater: QE is directed against the historically rare circumstance of the overnight rate of interest being at the zero lower bound; QE involves purchases of medium- and long-term securities, not just short-term assets; and QE that implies also credit-easing involves purchases of non-government securities with a view to reducing the spread between safe government bonds and risky private-sector assets.

Despite the support it has received from a range of prominent economists, QE has been a controversial policy. The harshest critics on the left of the policy spectrum claim it does nothing to boost actual output but instead provides an excuse for not implementing necessary fiscal policy measures. The harshest right-wing critics call it a massive expansion of the money supply fated to induce a dramatic increase in inflation rates in accordance with the quantity theory of money.

Empirical studies have produced results about the impact of QE on output mostly in the range from negligible at one end to positive and economically significant, though not large, at the other end. The empirical evidence on inflation indicates that QE has done little to change inflation rates, and that predictions of high rates of inflation have failed completely. A common mainstream conclusion, then, is that QE has had a small but significant positive impact on output with no discernible increase in inflation rates.

The term “quantitative easing” was rarely used in English-language sources prior to the last quarter of 2008, and when it was used, it was used to describe the monetary policy of the Bank of Japan earlier in the decade.

Following the collapse of stock and real-estate market bubbles that had formed in the latter half of the 1980s, the Japanese economy went into recession in 1992, prompting the Bank of Japan to cut its key policy rate of interest, which was lowered to a mere 50 basis points by late 1995 (MacLean, 2006). When the Japanese economy went into recession again in 1997, various economists recommended unconventional monetary policy responses to the Bank of Japan, one of which was indeed the expansion of the monetary base that would later be termed quantitative easing.

In March 2001, following yet another downturn in the Japanese economy, the Bank of Japan announced a policy of QE with the idea that it would boost spending and output in the Japanese economy by flattening the yield curve. This is the idea that, although the Bank of Japan and other central banks typically target a very short-term interest rate, medium- and long-term rates of interest matter most for private-sector investment

and consumption spending. Even with short-term interest rates near zero, medium- and long-term rates of interest may still be significantly above zero, and if they can be lowered, the yield curve will have been flattened, and spending in the economy can be given a boost.

To flatten the yield curve, QE was employed by the Bank of Japan in conjunction with the unconventional monetary policy of a zero interest rate commitment (ZIRC), a specific form of forward guidance. With the ZIRC, the Bank of Japan made a public promise to keep its key policy rate of interest at zero, at least until the inflation rate measured by the consumer price index stabilized at or above zero per cent.

Japan's experience with QE in 2001–06, and with unconventional monetary policy more generally, was studied by other central banks, and when their key policy rates of interest reached the effective lower bound in 2008 or 2009, several of them implemented lessons drawn from Japan's experience.

The most studied employment of QE in the period since the Great Recession of 2007–09 is that of the US Federal Reserve, which by mid 2013 had implemented three rounds of QE known as QE1 (begun in November 2008), QE2 (from November 2010), and QE3 (from September 2012). As compared with the earlier experience of QE in Japan, a distinctive feature of QE1 in the United States (see Blinder, 2010) was that it was initially less focused on flattening the yield curve than with credit easing – compressing the interest-rate spread between safe and risky assets that had widened during the financial crisis.

Central bankers in their policy pronouncements have shown no hesitation in identifying flattening of the yield curve and/or compressing the interest-rate spread as channels by which QE would provide spending stimulus to the economy. They have also shown little hesitation in pointing to potential channels such as QE resulting in increased asset prices and moderately higher expected inflation rates, both of which could trigger consumption spending increases.

There are, however, at least two other channels by which QE could create spending stimulus that central bankers have generally been hesitant to discuss.

One channel is through exchange-rate depreciation, which tends to be downplayed as an aim by central bankers pursuing QE, because it is often viewed by policy makers in other countries as having a “beggar thy neighbour” dimension.

The other channel is via monetization of government debt. Economies in which QE has been employed have typically had high government-debt-to-GDP ratios that, for various reasons, have made governments reluctant to pursue expansionary fiscal policy that could produce even higher ratios. If, however, as part of QE, the central bank purchases newly issued government bonds associated with larger government deficits, the liability issued by the government becomes the asset acquired by the central bank and there is no increase in the net debt of the public sector (of which the central bank is a part). Monetization of the government debt, then, can potentially promote more expansionary fiscal policy.

Although monetization of government debt remains something of a taboo, it was favourably analysed by Federal Reserve Governor Ben Bernanke (2003) before he became Governor in a speech that is cited by former UK Financial Services Agency Chairman Adair Turner (2013) in his advocacy of a form of government debt monetization he terms “overt money finance”. Indeed, in the spring of 2013 monetization of government debt

showed signs of becoming less of a taboo owing to sympathetic coverage of Turner's views in the financial press.

BRIAN K. MACLEAN

See also:

Bank of Japan; Credit easing; Effective lower bound; Financial crisis; Housing bubble; Money supply; Open-market operations; Output gap; Policy rates of interest; Quantity theory of money; Yield curve; Zero interest-rate policy.

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Quantity theory of credit

The quantity theory of credit (QTC) was originally proposed in 1992 (Werner, 1992, 1997, 2005, 2012; see also *The Economist*, 1993). It is the simplest macro model that incorporates the key feature of banks. It is also sometimes referred to as the quantity theory of disaggregated credit. QTC postulates that all money is credit, and this credit-money has a different impact on the economy, depending on its use. The basic version disaggregates credit into two streams: credit for GDP transactions ("credit for the real economy", C_R), which determines nominal GDP (equation (1)), and credit for non-GDP transactions ("credit for financial transactions", C_F), which determines the value of asset transactions (equation (2)):

$$C_R V_R = P_R Y \quad (1)$$

$$C_F V_F = P_F Q_F \quad (2)$$

The respective velocities V_R and V_F are assumed to be constant, which has been supported by evidence (Werner, 1997, 2005). The growth equations are:

$$V_R \Delta C_R = \Delta(P_R Y) \quad (3)$$

$$V_F \Delta C_F = \Delta(P_F Q_F) \quad (4)$$

Since QTC does not require the necessary assumptions for equilibrium to hold, markets are rationed and determined by the short-side principle: whichever quantity of demand or supply is smaller is transacted. The short side can also extract non-price benefits, as it has allocation power and can pick and choose from among the long side.

Concerning money and credit, QTC assumes that the demand for credit-money is infinite, rendering the credit market supply-determined at all times. Credit-money, which

makes up 97 per cent of the money supply, is supplied by banks through the process of credit creation. Thus banks are at the centre of the economy, not acting as financial intermediaries. Banks determine how much money is issued, given to whom and for what types of transactions. Central banks are able to influence banks' credit creation and allocation decisions, not least via a gamut of credit guidance policies (such as adopted by the Bank of England in June 2014, capping mortgage lending), but at times have chosen to adopt a policy of deliberate neglect.

QTC solves a number of problems in macroeconomics, namely:

- (1) The apparent “velocity decline”, “breakdown of the money demand function”, or “mystery of the missing money”. In the traditional “equation of exchange” ($MV = PY$), the money supply is supposed to be in a stable relationship with nominal GDP. But such a relationship “came apart at the seams during the course of the 1980s” (Goodhart, 1989, p. 298). The money supply grew faster than nominal GDP, and the velocity of money circulation declined. Monetary aggregates from M0 to M4 were targeted and rejected. Macroeconomic models that did not include money became appealing (real business cycle or dynamic stochastic general equilibrium models), while the velocity decline phenomenon remained unresolved. QTC resolves it by arguing that $MV = PY$ is incorrect, as it ignores money used for financial transactions. The QTC velocities on the other hand are stable (Werner, 1997, 2005).
- (2) The role of banks, which remains a persistent puzzle in conventional macroeconomics. Conventional models consider them financial intermediaries, to wit, agents that can be dropped from the analysis. But empirically they have been shown to be special time and again (Ashcraft, 2005). QTC resolves this by arguing that banks are special owing to their credit creation and allocation function, supporting the credit creation theory of banking.
- (3) The empirical puzzle of interest rates. Conventional theory considers these rates as the pivotal variable. Lower interest rates are supposed to exert a positive impact on nominal GDP and vice versa, while interest rates are supposed to determine asset prices. However, there has been virtually no empirical support for these claims (see Fazzari, 1994, and Werner, 2012, for a brief survey of studies). This is because the pivotal role of interest rates is a theoretical proposition, not derived from empirical facts: it requires markets to be in equilibrium, so that prices (the price of money being the rate of interest) determine the outcome. QTC resolves this issue, as it does not assume market equilibrium. With rationed markets, quantities determine the outcome, not prices. QTC maintains that credit quantities (appropriately disaggregated) determine nominal GDP growth and asset prices. Werner (2005) argues that nominal interest rates follow nominal GDP growth, as the latter indicates the ability to service and repay the loans that created it. QTC also explains why decades of interest-rate reductions have failed to stimulate economic growth in Japan (a phenomenon neither addressed nor explained by the so-called liquidity trap argument, which is not concerned with the ineffectiveness of interest-rate *reductions*): interest rates followed nominal GDP growth down. To stimulate the economy, an expansion in credit creation is a necessary and sufficient condition, irrespective of the interest rate.
- (4) The recurring banking crises and recessions. QTC argues that bank credit creation for non-GDP transactions, if expanding in aggregate, will result in asset

price rises, initiating a Ponzi scheme: financial transactions are zero-sum games, but can be played over time thanks to credit creation. Speculators funded by bank money creation can purchase assets at the beginning of an asset price rise. When the asset bubble matures and the early speculators sell out – to less well-informed investors – a transfer of wealth from the late players (buying high and selling low) to the early players (buying low and selling high) is effected. When asset bubbles burst and late-coming speculators go bankrupt, non-performing loans rise, rendering banks more risk-averse. With bank equity of only 10 per cent of assets, small falls in asset values can bankrupt the banks exposed to financial credit (C_F). QTC holds that banking crises and their prior asset bubbles can be prevented by restricting bank credit for transactions that do not contribute to GDP, as they are not sustainable but are costly for society. (They also increase income and wealth inequality.)

- (5) The success of the German and East-Asian economic models. QTC argues that bank credit creation can fund three types of transactions: financial credit, consumption credit and investment credit. The former two are unproductive, result in a type of inflation, and are unsustainable (non-GDP or financial transactions produce asset price cycles; consumption credit contributes to nominal GDP, but not real GDP, as it results in consumer price inflation). The successfully developed East-Asian “miracle economies” operated a system of credit guidance to suppress harmful and unsustainable financial and consumption bank credit creation, and to increase productive credit creation funding investments in the implementation of new technologies or creation of new higher value added goods or services. Although pioneered by the German Reichsbank, this tool was not used in post-war Germany. The same result was achieved thanks to the structure of the German banking sector, consisting largely of over 1,600 not-for-profit, small, local banks focusing on lending to productive small and medium-sized enterprises.

QTC also suggests how to end post-bubble banking crises and recessions, including in the euro area (Werner, 2014). It has been empirically supported (for an overview, see Werner, 2012). Further, the Federal Reserve, the Bank of England and the European Central Bank have recently adopted key tenets of QTC, which are not supported by any other theory (because other theories do not disaggregate credit into credit for the real economy versus credit for financial transactions).

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See also:

Credit creation; Credit easing; Credit guidance; Euro-area crisis; Interest rates setting; Liquidity trap; Quantity theory of money; Reichsbank.

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Quantity theory of money

The quantity theory of money, developed by neoclassical economists in the first half of the twentieth century (up to Keynes's *General Theory*, 1936), is a condensed formalization of the concept of the neutrality of money, which was strongly rooted in classical economic thought. Thus, prior to Keynesian monetary theory, money was considered as a veil cloaking real magnitudes without influencing them.

In the quantity theory of money a single mathematical expression is used in a twofold version: the so-called "exchange equation" and the Cambridge equation. The exchange equation, which is the first configuration of the quantity theory of money, was proposed by Fisher (1911, ch. 2) and represents the transaction-velocity approach. This equation, which links the quantity of money to the goods and services exchanged involving a monetary compensation, is written as follows:

$$MV = PT$$

where M represents the money stock, given by the average amount of money in circulation during the relevant period, V is money's velocity of circulation with respect to transactions, P is the general price level, and T represents the volume of transactions performed during such a period.

The exchange equation is an identity, because by definition within an economic system the overall monetary value of the transactions carried out (MV) coincides with the overall value of the items exchanged (PT). However, in the short run, V can be considered as fixed ($V = \bar{V}$), owing to the stability of some institutional characteristics of the economy (linked to the structure of the payments system and the temporal distribution of income and expenditure). Moreover, T can be regarded as constant ($T = \bar{T}$), because the underlying production system changes only in the long run.

In this framework, the above identity becomes an equation (Laidler, 1969, ch. 4) that shows the existence of a direct link between the money supply (M^s) and the general price level:

$$M^d = \frac{\bar{T}}{\bar{V}} P$$

It follows that, in the short run, any changes in the quantity of money in circulation are totally reflected in the general price level. Clearly, this expression also reflects the economic agents' demand for money, which is motivated by their need to make use of money to carry out their economic transactions.

The second expression of the quantity theory of money – that is, the Cambridge equation – delineates the cash-balance approach and represents an evolution of the exchange equation (Pigou, 1917; Keynes, 1923, ch. 3; Marshall, 1923, ch. 4 and app. C). This evolution emphasizes the demand for money, which is viewed in relation to the income available in the economic system. Accordingly, the Cambridge equation is as follows:

$$M = kPy$$

where k is a coefficient and y represents the real income of the economy as a whole.

This relation focuses on the motivations driving an individual to hold money, and underlines the microeconomic connotation of the analytical methodology adopted.

In this circumstance, taking into account that k and y can be considered constant ($k = \bar{k}$; $y = \bar{y}$) in the short run for the same reasons noted in regard to the exchange equation, the above equation gives rise to a demand for money function (M^d) as follows (Laidler, 1969, ch. 4):

$$M^d = \bar{k}P\bar{y}$$

Thus, again, any variation in the quantity of money in circulation can be compensated only by equivalent modifications in the general price level.

The cash-balance approach aimed to overcome what was considered as an essentially mechanistic approach to the relation between the quantity of money and the price level (Patinkin, 1965, ch. 8). Indeed, Fisher's analysis aimed to establish (given V) the overall demand for money as a function of the volume of exchanges characterizing the underlying economy. Therefore, this new approach sought to offer an in-depth analysis of that relation. The essential determinant for holding money was no longer represented by the requirement that money itself should settle all transactions within the economy, but rather by individuals' desire to hold a certain quantity of money, enabling each economic agent to engage in the desired exchanges (given that money is universally accepted in exchange for any traded goods).

Although the essential characteristic of both formulations of the quantity theory was in principle limited to depict the neutrality of money, it produced a sharp separation between the real and monetary sectors, leading to a complete dichotomy between them. The equations illustrating the functioning of the economy were, consequently, divided into two separate groups. One group pertained to the real sector and was studied by the theory of value, giving rise to relative prices and the equilibrium quantity of goods. The other pertained to the monetary sector and was captured by the quantity equation, which expresses the general level of equilibrium prices.

This dichotomy deprived monetary variables of any relevance within the economic system and produced an economic model that did not delineate a monetary economy but, rather, a barter economy (Patinkin, 1965, ch. 8).

The dichotomy's problem would be overcome, subsequently, only by the Patinkin

model which, maintaining the neutrality of money in equilibrium through the “real-balance effect” (the wealth effect linked to the purchasing power of money held by economic agents), allowed the possibility that the changes in money supply and in prices, between one equilibrium and another, would be reflected in agents’ commodity demand in order to stimulate the necessary price adjustments.

The neoclassical approach to monetary theory (formalized rigorously by the Patinkin model) thus involved the neutrality of money, establishing a direct link between the quantity of money (considered as exogenous) and the absolute price level. Important links between these two variables were also established in later years by scholars adopting the classical theoretical paradigm and the Walrasian general equilibrium, particularly by the monetarist school, which holds that money is neutral beyond the short run, and the New Classical macroeconomics, which maintains that monetary policy is always ineffective because only unexpected variations in money supply can influence real variables.

These economic theories are based on three assumptions: perfect price flexibility, lack of money illusion in agents’ behaviour, and irrelevance of distributive effects resulting from changes in the amount of fiat money. Such assumptions are strongly criticized by Keynesian economists (Crouch, 1972, ch. 7), who underline price rigidity above all in reference to wages, regulated by trade-union agreements, and to the interest rate, whose movements are influenced by the “liquidity trap”. They also admit the existence of money illusion (recognizing the effect of monetary phenomena on real variables) specifically impacting on the labour market (labour supply being influenced by the monetary wage) and the bond market (where supply depends on the price level) (*ibid.*, ch. 5). Keynesians observe also that, in order for money to be neutral, all changes in the nominal quantity of fiat money have to occur by varying the individual’s initial money holdings in the same proportion as changes in the stock of money, thereby eliminating the distributive effects of these changes. Therefore, without such an *ad hoc* assumption, the neutrality of money loses its validity, and money itself can exert considerable influence on the real variables of the economy.

Together with these criticisms based on the orthodox approach, the quantity theory of money is also criticized by heterodox approaches deriving, particularly, from the post-Keynesian School and the Dijon–Fribourg School developed in France and Switzerland by Bernard Schmitt from the late 1950s. Post-Keynesian criticism is based on in-depth studies concerning both the nature of money and its relation to economic activity, emphasizing principally the endogeneity of money and the need to elaborate a monetary theory of production (Graziani, 2003). Criticisms voiced by the Dijon–Fribourg School focus on the manner of measuring the price level (and thus the value of money), as well as on the fact that bank money is an endogenous magnitude. This leads above all to an innovative analysis of inflation, which shifts from a “real” and “behavioural” microeconomic approach to a “monetary” and “structural” macroeconomic approach (Rossi, 2001, ch. 5; Rossi, 2011).

GIUSEPPE MASTROMATTEO AND ADELMO TEDESCHI

See also:

Classical dichotomy; Endogenous money; Inflation; Liquidity trap; Monetarism; Monetary circuit; Money illusion; Money neutrality; Money supply; Patinkin, Don; Quantity theory of credit; Real-balance effect.

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Quantum macroeconomics

The expression "quantum macroeconomics" stands for the macroeconomic analysis developed by Bernard Schmitt since the late 1950s. With the publication of *La Formation du Pouvoir d'Achat* (1960) he laid the foundations of a new approach based on the concept of bank money and on the analytical and factual distinction between (nominal) money and income. Money is no longer conceived as an asset or a veil but as a numerical form or simply numbers issued by banks as their spontaneous acknowledgment of debt and in accordance with the principle of double-entry bookkeeping. Since neither banks nor any other human institution can create a positive magnitude out of nothing and since the logic of double-entry bookkeeping requires the constant balancing of credit and debit, money is best defined as an asset–liability of no positive value. The emission of money is economically relevant when money is associated with production, a real emission whose physical output becomes money's real content.

The term "quantum" derives from Schmitt's analysis of production and from his discovery that produced output is defined in quantum time (see Schmitt, 1984). Contrary to what is advocated by traditional micro and macroeconomic analysis, production is not a function of continuous or discontinuous time, as no essential distinction can be drawn between product and production. In the equation:

$$\text{product} = \text{production} \times \Delta t$$

Δt is always and necessarily equal to 1. A finite period of time (t) that is given instantaneously as an indivisible whole is a quantum of time. Schmitt is then able to show that human labour alone can be considered as a macroeconomic factor of production, since:

(i) labour alone can give a new utility-form to matter and energy; and (ii) the payment of wages is the only transaction that can give a monetary form to produced output.

In the absence of money, output would be immediately appropriated by producers as a use-value. Money alone can separate production and consumption chronologically, while the two continue to be the two faces of one and the same emission in quantum time. Through the payment of wages, produced output acquires a monetary form and a positive income is formed: this is the proper meaning of economic production. Through its final expenditure, income is destroyed and output abandons its monetary form: this is what economic consumption stands for (see Cencini, 2001).

Schmitt's quantum analysis is constitutively macroeconomic for two reasons: it deals with macroeconomic variables, and it rests on macroeconomic foundations. These are essentially given by two logical laws derived from the nature of money and its unique relationship with produced output (see Cencini, 2005). The first law describes the identity of global supply and global demand. It directly results from the absolute exchange between money and physical output that defines production, and may be traced back to Keynes's identity between Y and $C + I$. The second fundamental law establishes the identity between each economic agent's sales and purchases. As a direct consequence of double-entry bookkeeping, this law upholds the flow nature of money and applies both nationally and internationally. Correctly understood, double-entry bookkeeping requires the credit–debit or the debit–credit of every economic agent involved in a transaction. In terms of sales and purchases this means that, within a national economy, each agent can pay for his purchases on the labour, product or financial markets only through his simultaneous sales on one or more of these same markets. Money acts as a flow, as a numerical vehicle conveying the reciprocal payments between agents and enabling their final settlement in real terms (see Rossi, 2007).

Through his analysis of the process of capital formation and accumulation, Schmitt (1984) demonstrates the existence of the pathology that is at the origin of both inflation and involuntary unemployment, and which cannot be blamed on economic agents' behaviour. Contrary to mainstream analysis, Schmitt (*ibid.*) shows that economic disorder inside a country stems from an inconsistency between the present system of national payments and the threefold distinction between money, income and fixed capital respectful of the logical laws of macroeconomics.

Quantum macroeconomics also deals with international economic issues, and provides a new analysis of the pathologies jeopardizing the present system of international payments. The concept of money prevails, here too, and Schmitt (1975) demonstrates that the use of money as an object of exchange is at odds with its nature as a flow. Payments are carried out through the use of money, yet money can never be the object of any payment. This result is a generalization of the law of the macroeconomic identity between each agent's sales and purchases applied now to countries. It establishes that a country's purchases of goods, services and/or financial assets must necessarily equal its sales on commodities and financial markets. Thus, a country's net commercial imports are necessarily balanced by equivalent financial exports from this country, money being a mere intermediary between the real terms of any transaction. From this starting point, quantum analysis shows that the present system of relative exchange rates is based on an erroneous conception of money and ought to be replaced by a system of absolute exchange rates consistent with the vehicular or circular use of money.

An important part of Schmitt's analysis concerns the problem of external debt. His untiring work on this subject has led him to discover the "interest theorem", which states that interest payments on external debts are multiplied by 2: interest is paid by the residents bearing the principal of the external debt and, additionally, by their country's official reserves (Schmitt, 2012). In a world where money is considered an asset, the payment of interest has a monetary cost that adds up, pathologically, to its real cost. Schmitt's investigation of the external debt problem is a breakthrough in international economics, and his reform plan (see Schmitt, 1973) for a new system of international payments is instrumental in a long-overdue attempt to solve the current global crisis.

ALVARO CENCINI

See also:

Bank deposits; Bank money; Endogenous money; Inflation; Inflation measurement; International settlement institution; Monetary circuit.

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Quesnay, Pierre

Pierre Quesnay (1895–1937), a descendant of the encyclopaedist and Physiocrat economist François Quesnay, has been neglected in French monetary history. He studied law at the University of Paris Sorbonne, where Charles Rist introduced him to "monetary facts". He was involved, along with Rist, in the stabilization of Austria and in the process of stabilizing the franc Poincaré, one of Rist's major achievements. He became the most important member of the *triumvirate* alongside Emile Moreau and Rist, during his time at the Banque de France, promoting important reforms that affected the French banking and financial systems at that time.

Quesnay's career began with his nomination to the League of Nations in Vienna in the early 1920s, to serve on the Inter-allied Reparations Commission. At that time, Austria was suffering a major depression resulting from the inadequacy of economic activity to the post-war reality. This gave rise to huge public finance problems, and the exchange rate of the Austrian currency underwent successive depreciations as a result of speculation, which had led to hyperinflation.

Created in 1919, the League of Nations was asked by the Allies in 1921 to take charge of the Austrian situation. They recommended fiscal discipline, and restrictive budgetary and monetary policies. The restoration of monetary circulation was conditioned by the achievement of intermediate goals such as restoring fiscal balance, and transforming the

old central bank into a modern and independent monetary institution. In addition, Rist and Quesnay argued that Austria should be reinstated as an important economic and commercial centre, a bridge between Western and Eastern countries. The experiences that Quesnay accumulated during this time would serve him well, some years later, when he was appointed at the Banque de France.

After the First World War, the first objective of the French monetary authorities was to re-establish the pre-war gold content of the French franc. In 1925–26, the French GDP was stagnating and the French economy began to experience inflation. As time went by, industrialists, economists, bankers and politicians agreed on the necessity to stabilize the exchange rate of the French franc in terms of gold. Rist and Quesnay were among the proponents of this stabilization, but they were convinced that it must be achieved while preserving economic growth; that is, without deflating the purchasing power of money. Moreau, who was the new Governor of the Banque de France at that time, nominated Quesnay to head the newly created Department of Economic Studies at the Banque. Quesnay's technical skills were fundamental in determining the optimal new rate of conversion of the French franc into gold. Confidence in the French franc enabled him to propose other initiatives. Influenced by Benjamin Strong and the example of the New York Federal Reserve, Quesnay proposed that the statutes of the Banque de France should evolve to make this institution more independent. He explained that the Banque de France should have the possibility of controlling the interbank market, which meant it should be able to participate in open-market operations. Other innovative ways to manage the currency were suggested by Strong (Moreau, 1954, p. 92). By adopting them, the French team managed a successful stabilization process, which had an enormous impact on the British pound as well. Capital inflows to France became so important that they threatened the British pound. In 1927, the success of stabilization in France contributed to Strong's views that pressure on the London market should now be dampened. The influence of Strong as a sort of "shadow" advisor was important for the Banque de France and even more so for Quesnay, who, compared to Moreau and Rist, had developed a very extremist view of the independence of the Banque. This could be considered the first sign of divergence between Rist and Quesnay.

After the stabilization of the French franc, Pierre Quesnay focused on the international monetary system, which led eventually to his involvement in the Bank for International Settlements (BIS), of which he was the first director from 1930 until 1937. After some dissensions between British, German, US and French commissioners and as a result of a compromise, Pierre Quesnay was chosen as the BIS director because he shared the US Administration's extended conception of the BIS. He developed this conception in an article written in 1929, where he quotes extensively from chapter IV of the BIS charter, and considers it as "a link between central banks whose collaboration is necessary for the stability of the world architecture of credit" (Quesnay, 1929, p. 1052).

After the failure of the Credit Anstalt in 1931 and the moratorium on World War I debt payments, it was time for the BIS to adapt to circumstances and limit the consequences of the Great Depression. The role of the BIS during this period is usually judged rather severely. However, as Feiertag (1999) points out, the BIS coordinated and synchronized the international support offered to the Reichsbank and to the Austrian economy at the peak of the crisis, and contributed some of its own funds to the amount of credit offered. These initiatives came too late and were too limited. The BIS failed as a financial

institution, but constituted a laboratory to nurture the future International Monetary Fund, and highlighted that financial coordination and intervention can be efficient only if the institution that is in charge of them has funds, power and independence.

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See also:

Banque de France; Central bank independence; Hyperinflation; International Monetary Fund; Open-market operations; Rist, Charles; Strong, Benjamin.

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R

Random walk

Under a “random walk”, the movement of an object is said to be independent of the previous movement, such as the movement of particles suspended in a fluid as they collide with atoms and molecules. In financial markets, the price is said to follow a random walk if price movements are both independent and conform to a known probability distribution. There would be no possibility to profit using price data alone, because “the mathematical expectation of a speculator is nil” (Bachelier, 1900, p. 10).

Bachelier’s theory can be expressed, in its simplest form, as follows:

Let $Z(t)$ be the price of a stock, or of a unit of commodity, at the end of time period t . Then it is assumed that successive differences of the form $Z(t + T) - Z(t)$ are independent, Gaussian or normally distributed, random variables with zero mean and variance proportional to the differencing interval T . (Mandelbrot, 1963, p. 394)

Mandelbrot revived interest in Bachelier, testing the theory using cotton prices and proposing two revisions. First, price movements were expressed as a lognormal random walk: $\log Z(t)$ instead of $Z(t)$. In other words, the percentage price movement is random. Second, rather than assume a Gaussian or normal distribution of price movements, Mandelbrot introduced a new family of stable Pareto distributions where “the Gaussian is a limiting case [. . .] so the new model is actually a generalization of that of Bachelier” (Mandelbrot, 1963, p. 395). In developing the efficient market hypothesis, Fama (1965, p. 98) “presented strong and voluminous evidence in favor of the [Pareto distribution] random-walk hypothesis”.

These two assumptions, of independence and conformity to a known probability distribution, have become deeply entrenched as the null hypotheses. The empirical literature for stock prices showed that, even in the long run, there was “weak statistical evidence [. . .] that returns have no autocorrelation and prices are random walks” (Fama, 1991, p. 1581). Similar results have been postulated for commodity markets such as coal (McNerney et al., 2012) and oil markets where the futures curve is no better as a “predictor of spot prices than a random walk” (Bank of England, 2012, p. 43).

In practice, investment managers have shifted towards quantitative approaches that carefully consider “the scientific evidence that has been accumulated” (Malkiel, 2003, p. 179). These approaches are founded on underlying techniques, such as the Capital Asset Pricing Model (CAPM), that assume a probability distribution. Despite the Gaussian being the limiting case, the Black–Scholes option pricing formula was “built around Gaussian distributions on returns” (Taylor, 2011, p. 266) because of the mathematical difficulty in using the Pareto distribution.

Yet for investment decisions the risk price is determined with a simpler, exponential method. If risk prices were to follow a random walk, then we would discount “the far future much less than an agent with a constant discount rate” (Doyné Farmer and Geanakoplos, 2009, p. 5). Such discounting would give greater emphasis to environmental projects, such as the mitigation of global warming, until risk prices became more certain.

When pricing models assume a stable distribution or movement dependence, they

suggest a regularity that does not exist. Relaxing both assumptions would better reflect a world that is fundamentally uncertain.

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See also:

Asset price inflation; Efficient markets theory.

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Real-balance effect

Usually associated with the work of Patinkin (1956), the real-balance effect refers to the mechanism that links, in a general equilibrium framework, the market for goods and the market for money through the introduction of the real value of money balances in the excess demand functions for goods. As it represents a convenient way to overcome the inconsistency of the so-called “classical dichotomy”, the real-balance effect justifies the association of money and goods in a real-exchange economy. Against this background, Patinkin (ibid.) applies the marginal utility analysis to money.

According to Patinkin (ibid.), the “classical” economic analysis is flawed by an inconsistency between Walras’s law, which rules the general equilibrium framework, and the quantity theory of money. In this respect, the pricing process is dichotomized between the determination of relative prices, which aims to clear all excess demands on the goods market, and the determination of the absolute price level. The latter, which is considered to be proportional to the supply of money, is determined through an equation modelling the market for money (such as the Cambridge equation of exchange). As the excess demand functions for goods depend only on relative prices and agents’ initial endowments, the goods market remains in equilibrium for any absolute price level.

Hence, as money is not a determinant of the excess demand functions for goods, an increase in the absolute price level does not alter the goods market equilibrium. Furthermore, as there is no excess demand on the goods market, the excess demand for money has to remain nil according to Walras’s law. Now, following the quantity theory of money, an increase in the absolute price level implies an excess demand for money for the transaction motive. In other words, an increase in the absolute price level does not induce, in a general equilibrium framework, any adjustment mechanism that would allow this

level to get back to its initial position, while, according to the quantity theory of money, such an adjustment mechanism is generated by an excess demand for money.

In order to overcome such an inconsistency, Patinkin (1956) suggests considering the real value of money balances as a determinant of the excess demand functions for goods. Hence, money has to be introduced into the utility function. Patinkin (*ibid.*) justifies this inclusion with the precautionary motive: a stochastic payment process ensures that the timing of receipts and disbursements is not perfectly known in advance by economic agents. Such an uncertainty makes it rational for the latter to hold money balances during a positive period of time (note that such a rationale for holding money is not based on the purchasing power of money).

Therefore, the demand for goods does not only depend on their relative prices and on agents' initial endowments, but also on the real value of money balances; that is, on the inverse of the absolute price level – as the quantity theory of money states. In such a framework, if relative prices and the initial endowment of goods remain unchanged, an increase in the absolute price level induces an excess demand for nominal money and, in accordance with Walras's law, an excess supply for goods, since the change in the absolute price level reduces the real value of money balances. According to the law of supply and demand, the real-balance effect ensures that such disequilibrium is cancelled out through an increase in the real value of money balances; that is, a decrease in the absolute price level. Consequently, the real-balance effect is a major achievement for neoclassical theory, because it gives sound microfoundations to the general equilibrium model of a money-using economy, while ensuring the existence of an adjustment process. For this reason, the real-balance effect was subject to several developments and critiques.

A prerequisite for the existence of the real-balance effect relates to the nature of money as an asset. According to Gurley and Shaw (1960), for the real-balance effect to be significant, the supply of money must contain some "outside money"; that is, an asset, for the private sector, which represents the counterpart of a liability of the public sector. Indeed, when the supply of money consists entirely of "inside money" (to wit, an asset for the private sector that is a counterpart of a liability of the private sector), the effect of a change in the real value of money balances is nil for the aggregate net worth of the private sector (as a change in the real value of the private sector's bank deposits is offset by an opposite change in the real value of the private sector's bank loans).

An important critique of the real-balance effect was raised by Archibald and Lipsey (1958). These authors extend the temporary equilibrium analysis of Patinkin (1956) to a full equilibrium model, which defines a stationary economy. In doing so, the authors argue that the classical dichotomy is perfectly consistent, because "the role of the real balance effect is only to provide an explanation of how the system behaves in disequilibrium. Thus the real balance effect is irrelevant to those famous propositions of the quantity theory which are the result of comparative static analysis" (Archibald and Lipsey, 1958, p. 1).

The most serious critique to the model of Patinkin (1956), however, was raised by Hahn (1965). For this author, such a model, and all other general equilibrium models of a money-using economy, always contains a solution for which the price of money is nil, to wit, a general equilibrium with worthless money. Hence, as there is no rationale to introduce a worthless good into the utility function, money cannot be subject to marginal analysis, while the real-balance effect is an illusion (meaning that a monetary economy

does not imply its own adjustment mechanisms). As a matter of fact, money is not a commodity, because its purchasing power cannot be determined on the goods market. Indeed, money's purchasing power is not an ordinary price, because it has to be known by economic agents before a market session takes place: if the purchasing power of money is equal to the inverse of the price level, considered by Patinkin (1956) as the relative price of a composite good, economic agents have no rationale to hold money during a positive period of time, since its purchasing power is only known at the very instant of exchange. In this respect, the association between money and goods has to be considered before their exchanges take place, notably when banks issue money for the payment of wages, as the monetary theory of production explains (see Graziani, 2003).

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See also:

Classical dichotomy; Commodity money; Inside and outside money; Money illusion; Money neutrality; Patinkin, Don; Quantity theory of money.

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Real-bills doctrine

Adam Smith provided the most famous early statement of the real-bills doctrine (RBD) in *The Wealth of Nations*. Smith (1776 [2003], pp. 402–03) argued that if banks provided credit only against productive assets – that is, assets that increase firms' output – then these loans would always be repaid, because there would always be a real basis for profitability underlying them. This doctrine was used by Smith (*ibid.*, p. 416) to argue that practices of sound banking would avoid extending loans to fund the "chimerical schemes" of "projectors" that would lead to asset price speculation and, ultimately, banking crises. Thus the RBD became one of the first general rules for how banks should lend, and one of the first rules proposed by any economist that monetary authorities can uphold in order for them to promote macroeconomic stability.

The RBD became important in the so-called Bullionist debates surrounding the suspension of convertibility in England during the Napoleonic Wars. In this period Henry Thornton (1802) argued against Smith's version of the RBD from an anti-Bullionist perspective. Thornton insisted that bankers could not possibly tell the difference between a "real" bill backed by production and a "fictitious" bill, which was not (Arnon, 2007). Shortly after Thornton had paved the way for a modern endogenous or credit theory of money creation, other critics of the RBD, like the extreme Bullionist David Ricardo (1811), were attacking it while promoting reaffirmation of the quantity theory of money. The Bullionists believed that the RBD would lead to substantial inflationary pressures,

because if it were ever implemented there would be no solid check and balance on money issuance.

The RBD became interesting to economists again at the beginning of the twentieth century. The 1913 Federal Reserve Act in the United States was based in large part on the RBD. By the 1920s the US Federal Reserve understood its own role in the economy as being justified and guided by the RBD. US Federal Reserve officials saw themselves as being in a position to discount bills through their newly utilized ability to conduct open-market operations. The US Federal Reserve in these years concluded that it merely had to accommodate economic activity by discounting high-quality, short-term bills in order to accommodate the level of outstanding economic activity.

When produced output began to contract after the stock market crash in 1929, many on the Board of the US Federal Reserve used the RBD to justify their inaction. They reasoned that if monetary aggregates were driven by the demand for loans to finance production activities and the demand for these loans was drying up then it was logical to assume that the shock must be coming from somewhere else in the economy and was not tied up with the monetary system (Humphrey, 2001). This failure of the RBD led many to turn against that theory in the ensuing decades and, in retrospect, appears to have paved the way for the monetarist school of thought associated with Milton Friedman. Thus Humphrey (*ibid.*, p.311) argues that the Great Depression in the United States might have been avoided “had the Fed selected at the outset the state-of-the-art quantity theory framework rather than the flawed real bills framework”.

In the 1970s and 1980s monetarists turned once again to criticize the RBD. They argued that the RBD was a recipe for inflation, because money demand depended not only on the level of produced output in the economy but also on the level of prices (Humphrey, 1982). Thus, if there was an uptick in inflation, the number of bills being discounted would increase, which may, if prices continued to rise, lead to a further demand for discounting and so on *ad infinitum*. This was precisely the same critique that Thornton (1802) had made of Smith. The difference was that whereas Thornton and the Banking School saw other factors as the primary drivers of inflation, monetarists believed that the cause of inflation was too lax a money supply.

In this era, the RBD became synonymous with endogenous money theory, with many leading advocates of monetarism. In his textbook, Sargent (1979) argues that the idea that central banks should target interest rates rather than the money supply was identical in every respect to the RBD. The author is correct if one takes the theory of endogenous money in its Wicksellian guise. For Wicksell (1936), there is a “natural rate of interest” at which banks may provide credit without leading to inflation. This natural rate is identical to the rate that would be required if the resulting bank loans were only made to firms that engaged in productive investment that yielded output and hence ensured a constant price level.

Sargent (1979) and others were correct that in such a theory, if there were ever an uptick in inflation owing to other factors, the increase in the demand for loans could rise exponentially. This tie between the natural rate of interest and the RBD also stretches back to Thornton’s (1802) critique of Smith. Thornton (*ibid.*) correctly pointed out that bankers could not distinguish between speculative and productive investments. In this sense Thornton was a progenitor to post-Keynesian endogenous money theory, which rejects the idea of a natural rate of interest and asserts that capitalism is inherently

prone to speculative price changes. He and his Banking School colleagues, like Thomas Tooke (see Smith, 2007), also recognized that inflation and deflation often originate from outside of the monetary system and are not caused by the quantity of money being issued.

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See also:

Asset price inflation; Banking and Currency Schools; Bank money; Bullionist debates; Endogenous money; Federal Reserve System; Financial crisis; Financial instability; Inflation; Monetarism; Money and credit; Money creation; Money creation and economic growth; Money supply; Natural rate of interest; Open-market operations; Quantity theory of money; Ricardo, David; Thornton, Henry; Wicksell, Knut.

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Reflux mechanism

Since Moore (1988), post-Keynesian economists have actively discussed various aspects of money endogeneity. One question that has attracted attention is: if bank loans create bank deposits, what happens when economic agents do not wish to hold more money balances? In other words, what brings the supply of money equal to its demand?

Moore (1988) relied on convenience lending – that is, non-volitional holding of deposits by households – as an explanation, and held this view as late as 2005 (see Moore, 2005). Nicholas Kaldor – who can be considered as one of the originators of the post-Keynesian theory of endogenous money – had a slightly different answer. In particular, Kaldor and Trevithick (1981) pointed out the reflux mechanism, according to which agents repay bank advances leading to a reduction of the money stock. Another mechanism is the buying of income-yielding financial assets from banks (Kaldor, 1983, p. 21). As Lavoie (1999) reminds us, even Joan Robinson (1956) endorsed the reflux mechanism.

Kaldor (1985) himself may not have thought his answer complete, and his mechanism was to highlight errors in the monetarist hot-potato argument. As he points out, the loophole in this argument is that money was credit-money even when some commodities

were used as mediums of exchange. One important way in which the argument breaks down is due to the reflux mechanism.

Arestis and Howells (1996) emphasize asset allocation decisions, but at the same time downplay the role of the reflux mechanism, even calling it a “fallacy” (p. 548). Lavoie (1999), however, argues that not only is the reflux principle not inconsistent with asset allocation decisions, but it is crucial for understanding money endogeneity.

This can also be seen in stock–flow consistent models (Godley and Lavoie, 2007) based on the flow of funds and that significantly improve Tobin’s theory of asset allocation. Following the logic of the theory of the monetary circuit, stock–flow consistent models divide an economy into various sectors – such as households, producing firms, banks, the central bank, the government and the external sector – and give a careful narrative of each sector’s decisions and its implications.

The importance of the reflux mechanism can be clearly seen in these models. Households receive income from various sources such as wages, interest payments, and dividends, and make consumption and asset allocation decisions based on Keynes’s “two-stage decision” (Keynes, 1936, p. 166) and “Tobinesque principles” (Backus et al., 1980). The first stage is about how much income to save and the second stage is about how to allocate saving to various assets – what Rochon (1999) has called hoarded savings and financial savings. Households may also reduce their indebtedness toward the banking system. Firms take advances from banks to finance working capital and when they receive receipts, reduce their indebtedness to banks – highlighting the importance of the reflux mechanism.

As shown by Lavoie (2003), even in a simple model of a private economy – with firms issuing equities to households in addition to bank borrowing – there is a way in which loans are brought into equivalence with deposits. If households increase their preference to hold more deposits, firms are driven to take more loans from banks, and if households decrease their preference for deposits, this does not lead to more consumption, because that is a separate decision, but could either lead to a higher clearing price for equities or a larger issuance of equities by firms, proceeds of which will help them reduce their loans from banks. The reflux mechanism thus operates even in the framework of asset allocation.

The reflux mechanism also holds in an open economy (Lavoie, 2001). In post-Keynesian theory, the money supply is credit-led and demand-determined regardless of whether the exchange rate is fixed or floating. Here, the compensation thesis is important, according to which changes in the central bank’s foreign reserves will be compensated endogenously. The central bank may purchase foreign exchange either discretionarily or automatically in fixed exchange rate regimes to defend against exchange-rate appreciation in case there is a positive current-account balance of payments. Banks will see an increase in their settlement balances at the central bank account as a result and will either use these balances to reduce their indebtedness toward the central bank (which generates a reflux) or purchase Treasury bills from the central bank. The latter may itself occur at the initiation of the banks, as they will prefer to hold assets yielding higher income rather than earn a lower interest rate paid on central bank settlement balances. In this regard, the word “compensation” is more correct in describing the situation than “sterilization”. The compensation happens endogenously, because the central bank is defending a rate of interest – otherwise, in this case, short-term interest rates will fall to the floor of the

monetary policy “corridor”. Similarly, and contrary to what is assumed in the Mundell–Fleming model, a sale of foreign reserves by the central bank will lead to banks either increasing their advances to the central bank or selling it Treasury bills with no contraction in their settlement balances.

The reflux mechanism also works between exporters and their banks either in fixed or in free-floating exchange rate regimes, where the central bank rarely intervenes in foreign-exchange markets. When exporters receive payments and transform them in their domestic currency, they may reduce their advances from the banking system. Also, unless there is a strong shortage – such as some primary sector goods for example, exports will lead to a rise in produced output and income, and not exclusively to a rise in the price level, unlike neoclassical models.

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See also:

Bank money; Corridor and floor systems; Endogenous money; Flow of funds; Monetarism; Monetary circuit; Money and credit; Money creation; Settlement balances; Sterilization.

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Reichsbank

The Reichsbank was the central bank of Imperial Germany, the Weimer Republic and the Third Reich. Founded according to the Bank Law of 14 March 1875, the Reichsbank was the renamed privately-owned Prussian Statebank, retaining all branches, staff, the

internal organization and most private shareholders. It had the right to issue banknotes “without direct limitation” (Aldrich, 1910, p.28), but was originally one of 32 note-issuing banks. It served the government and other banks, but also private individuals and firms, acting as agency dealer for securities and precious metals. In 1910, its notes became legal tender. In 1912, the Reichsbank pioneered the most successful policy tool in central banking, namely the quantitative and qualitative guidance of bank credit. While the government could nominally supervise the bank until 1922, in practice there was little interference.

Until 1918, the Reichsbank’s main branches were in Berlin, Bochum, Bremen, Breslau, Chemnitz, Danzig, Dortmund, Düsseldorf, Elberfeld, Essen, Hamburg, Leipzig, Lübeck, Mannheim, Memel, München, Nürnberg, Posen, Stettin, Straßburg and Stuttgart. In 1910, there were 493 Reichsbank branches in total. Private shareholders exerted influence over the bank via the Berlin Directorate and the District Committees of the branches, staffed with local shareholder representatives. The Directorate (President, Vice-President, and six other members) had the status of the highest government department (*oberste Reichsbehörde*). The Reichsbank and its branches were exempt from all taxes. Conducting business with other private central banks, “the widest conceivable control over all international relations of German banking [was] assured to the Reichsbank” (Aldrich, 1910, p. 30).

Thought to have “proved to be the best system according to the experiences of most European countries” (ibid., p. 27), the structure of a privately owned central bank with shareholders represented at regional branches was the model for the US Federal Reserve. Its charter was drafted by Paul Warburg, later its vice-governor, whose brother Max was likewise a director and leading figure at the Reichsbank.

The large British war debts, mainly to the UK procurement and currency agent J.P. Morgan, resulted in the imposition of extremely punitive claims on Germany in the Versailles Treaty. The extraction of German gold was undertaken by the Reparations Commission, dominated by Morgan. To ensure an efficient transfer of German assets, the Commission demanded the Reichsbank be made free from German influence. By law of 26 May 1922 it was reorganized. Of the 14 members of the Reichsbank general council, half had to be non-Germans, with one each from the United Kingdom, France, Italy, the United States, Belgium, the Netherlands and Switzerland. Reichsbank staff were no longer civil servants, but enjoyed immunity from disciplinary procedures. Budgetary competence of the government over the Reichsbank was revoked. In short, the Reichsbank could choose its policies, goals and instruments, make its own rules, set its own pay, and its staff enjoyed quasi-diplomatic immunity. Contemporary commentators argued that thanks to its “complete freedom and independence” the Reichsbank would “bring advantages to the [. . .] interests of the central note issuing banks [. . .] whose business transactions between and among them are promoted and facilitated by the independence of the individual institutions” (Schanz, 1922, p.290).

All this independence and lack of accountability did not result in sensible monetary policies. The ink on the May 1922 Bank Law granting it complete autonomy had hardly dried when the Reichsbank embarked on a destructive policy of hyperinflation. This drove many German firms and individuals into bankruptcy, while the German currency collapsed, rendering German assets cheap to foreign buyers.

The Reparations Commission (later transformed into the Bank for International

Settlements) appointed a currency commissar for Germany, Hjalmar Schacht, who controlled note issuance, then made him President of the Reichsbank, from 1924 to 1930. He resumed this function from 1933 to 1939. A close friend of Bank of England governor Montagu Norman (who was godfather to one of Schacht's grandchildren), Schacht coordinated policies with the other private central banks "in extreme harmony" (Schacht, 1953, p. 331). Indicative of his loyalties, the discovery, on a visit to New York in the 1920s, that the Reichsbank gold had been mislaid by the New York Fed was rated by Schacht as "another amusing experience", clearly not worth endangering his close relations with Benjamin Strong for (Schacht, 1953, p. 331).

This was followed by Schacht's abuse of credit guidance to engage in industrial and regional policy in the later 1920s that was not coordinated with the government. Schacht became known as the "credit dictator" and the Reichsbank as the "second government". At the time, the Reichsbank encouraged the major Berlin banks to expand their short-term US dollar-denominated debt, a policy replayed by the Bank of Thailand before the Asian crisis (Werner, 2000, 2003). By insisting that German banks honour their US dollar debt when US investors pulled out, the Reichsbank imported the Wall Street crash to Germany: banks foreclosed on firms that laid off all their staff, creating large-scale unemployment in record time. Schacht, meanwhile, contacted the extremist Nazi party and offered to raise money from the industrialists. Having been nearly bankrupt, the Nazi party subsequently fought one of the most expensive election campaigns in German history, yet failed to become the largest party. But a letter organized by Schacht from Germany's leading industrialists, in awe of the "credit dictator", persuaded the Reich President to appoint Hitler as chancellor. In turn, Hitler, together with Reichsbank officials such as Max Warburg, reappointed Schacht as President of the Reichsbank. Schacht duly reflationed the economy by boosting credit, generating the popularity Hitler had been lacking (Werner, 2003).

Ironically, the Nazi government later decided that a totally independent central bank was not in the national interest, fired Schacht, and curbed the influence of private shareholders by transforming it into the Deutsche Reichsbank. The successful 1942 Bank of Japan Law, in place until 1997, was largely a translation of the 15 June 1939 Deutsche Reichsbank Law.

The legal status of the later Bundesbank reflected the view that central banks should be accountable to democratically elected assemblies. The independence of the Bundesbank was therefore reduced, compared to the Reichsbank, and it was accountable to parliament. This delivered financial stability, economic growth, and low inflation. But it was the Reichsbank that served as the model of the legal structure of the European Central Bank (ECB), not the Bundesbank (Werner, 2003, 2006). The ECB was established by an international treaty, is neither accountable to any government nor to any democratically elected assembly, and its staff enjoy extraterritorial quasi-diplomatic immunity. Hence the warning in 2003 that the ECB was likely to create vast credit bubbles, banking crises and unemployment to advance its political agenda (Werner, 2003): central banks get more powerful after each banking crisis, so regulatory moral hazard ensures recurring crises. The credit bubbles created by ECB policy in Ireland, Portugal, Greece and Spain triggered changes that have further increased its powers.

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See also:

Credit creation; Credit guidance; Deutsche Bundesbank; European Central Bank; Federal Reserve System; Hyperinflation; Norman, Montagu; Quantity theory of credit; Schacht, Hjalmar Horace Greeley; Strong, Benjamin.

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Repurchase agreement

A repurchase agreement (or "repo") is a financial-market transaction in which the seller of a given security agrees to buy back said security at a given price on a given date. Typically this repurchase price is higher than the original sale price, and the spread between the two is the interest rate on the repurchase, which is commonly known as the repo rate. A repurchase agreement can also be considered a collateralized or secured loan, where the seller of the financial asset is effectively borrowing from the buyer at a given rate of interest while providing the buyer with an asset as collateral. If the seller of the security defaults on his/her obligation to buy back the asset at the end of the time period, the buyer can then sell the asset on the market, although this entails risks with respect to the future market price of this asset. Similarly, if the buyer does not return the asset to the seller at the agreed date, the seller can use the cash to purchase other securities in the market. Repos can conceivably be undertaken using any asset as collateral but typically they are undertaken with highly liquid assets such as government bonds.

Repos play an extremely important role in central bank operations, and are used to smooth out fluctuations in bank reserves and thus maintain the interest rate targeted by monetary authorities. In the United States these operations are typically undertaken on an overnight basis, but can extend out for up to 65 business days. Repos are the most common type of open-market operations and are undertaken with primary dealers in the market via an auctioning process. In a repo agreement the central bank purchases securities using newly issued money, thus leading to a temporary increase in central bank money.

The central bank can also engage in what are known as "reverse repurchase agreements" (or "reverse repos") to alter the money supply. These involve the central bank removing money from the system by effectively borrowing it from counterparties in exchange for securities (Federal Reserve Bank of New York, 2007). This action has the opposite effect of a repo, as it leads to a temporary drain on the supply of central bank money.

A repo by the central bank will be used to put downward pressure on its targeted interest rate through the temporary injection of cash reserves, while a reverse repo will be used to put upward pressure on the targeted interest rate through the temporary removal of cash reserves. In a repo, the central bank agrees to buy securities from a sanctioned counterparty, usually a primary dealer, who will then agree to sell them back to the central bank at a specified later date. The amount of monetary reserves held by the counterparty thus increases. In the case of a reverse repo the opposite occurs. These actions put downward or upward pressure on the rate by increasing or decreasing the amount of reserves in the banking system.

Because of their ability for rapid deployment and their quickly reversible nature, repos and reverse repos are the best means that central banks have to ensure that their interest-rate target is always being hit. If the market interest rate is too high relative to the target rate of interest, central banks can provide a rapid infusion of reserves by engaging in repos; if the market rate of interest is too low, they can quickly remove reserves through reverse repos.

In the United States, the three types of general collateral that the US Federal Reserve accepts are marketable government securities, certain direct governmental financial obligations, and certain governmental “pass-throughs” or mortgage-backed securities (Federal Reserve Bank of New York, 2007).

Repos and reverse repos are important for post-Keynesian endogenous money theory. This theory explains that the banking system in a modern capitalist economy must accommodate the growing needs for money that arise from economic transactions, both financial and real. Thus, in the post-Keynesian framework, central banks set a target rate of interest and then allow the quantity of money to “float”. Post-Keynesian economists distinguish between two types of central bank actions in this regard: accommodative transactions and defensive transactions. Accommodative transactions are those that allow the money supply to expand in line with expansions in economic activities, while defensive transactions are those that allow savers to hold financial assets rather than deposits without disturbing the level of reserves in the system (Eichner, 1987; Lavoie, 1996; Rochon and Rossi, 2007).

There is a cleavage in the mainstream literature on the subject. Textbooks that specialize in banking give detailed descriptions of how repos and reverse repos are used by the central bank to control the targeted rate of interest (see Casu et al., 2006, p. 120). This implies that the central bank targets the short-term interest rate and allows the quantity of money to adjust accordingly; this, in turn, is how modern-day central banks perceive themselves to be operating (see McLeay et al., 2014). Some mainstream textbooks still insist that the central bank controls monetary aggregates (see Mankiw, 2009, pp. 79–80), while others recognize that it targets interest rates and allows the money supply to adjust (see Krugman and Wells, 2006, p. 351). The former textbooks cannot take repos into account, because of their presuppositions about the central bank controlling the money supply, while the latter generally do not go into detail about how the central bank achieves its target rate of interest.

Repos and reverse repos are an extremely important component in both types of interactions that the central bank undertakes with the rest of the economy. These interactions ensure that there are sufficient reserves in the banking system to meet its targeted interest rate and at the same time cause the central bank to become deeply involved in bilateral

and multilateral financial transactions between economic agents in the private sector, which effectively smooth out the demand for financial assets (Rochon and Rossi, 2007, pp. 550–51). Repos and reverse repos are thus key in accommodating the private sector's liquidity preference and asset allocation at any given moment in time. The modern financial system can thus be seen partly as a nexus of such repos, at the centre of which stands the central bank, which is always aiming, through its operations, to maintain its targeted rate of interest.

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See also:

Central bank money; Collateral; Effective lower bound; Endogenous money; Interest rates setting; LIBOR; Monetary aggregates; Money supply; Open-market operations; Policy rates of interest.

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Reserve Bank of India

Movements towards establishing a central bank in India were made with the amalgamation of India's three Presidency Banks of Bombay, Madras and Bengal into the Imperial Bank of India in 1920. Besides commercial banking business, the Imperial Bank was entrusted with two central banking functions: banker to the government and bankers' bank. Both the issue of currency and foreign-exchange management remained under government control. The 1925 Hilton Young Commission noted that vesting the responsibilities of credit and currency controls in two separate authorities was a limitation, and recommended setting up an institution to perform all the central banking functions. The Reserve Bank of India (RBI) was formally inaugurated on 1 April 1935 (Reserve Bank of India, 2005a).

The RBI initially performed the function of issuing banknotes. It provided elasticity to the currency system through its loans and open-market operations, and narrowed seasonal and regional variations in money market rates of interest by pursuing a relatively stable bank-rate policy. It controlled money market conditions by preventing the Treasury bill rate from becoming too low or high, and varying sterling tenders. Additionally, the RBI performed the function of loan floatation for the central and provincial governments, including issuing their Treasury bills. It also helped meet seasonal reserve requirements

of banks, and acted as a lender of last resort. Its monetary policy mainly focused on exchange-rate stability. Low levels of economic activity meant that controlling the money supply and inflation were less crucial during this period (Reserve Bank of India, 2005a).

The first five-year plan in 1951 stressed that the RBI must play an active role in developing a network of agricultural and industrial credit institutions. The Agricultural Refinance Corporation (later the National Bank for Agriculture and Rural Development) was established as an RBI subsidiary in 1963 for providing short-, medium- and long-term refinancing services in agriculture. The RBI was also closely involved with the establishment of the Industrial Finance Corporation of India, the Industrial Development Bank of India, and the Industrial Credit and Investment Corporation of India. Furthermore, the transformation of the Imperial Bank of India into the State Bank of India (SBI), and of some banks into SBI subsidiaries, helped establish banking offices in rural and semi-urban areas, and provide credit to small-scale industries. Despite these institutional efforts, however, many rural and urban areas continued to lack banking facilities. Also, large industries and established businesses were the main beneficiaries of credit facilities, while preferred sectors like agriculture and small-scale industries were neglected. The nationalization of 14 private commercial banks in 1969 sought to address these problems, and the RBI was entrusted with the task of ensuring that nationalized banks complied with its policies (Mohan, 2006).

The plan era also saw the RBI playing a crucial role in deficit financing, involving the extension of short-term advances, and the automatic creation of *ad-hoc* Treasury bills. Moreover, it maintained low interest rates for government securities to reduce the cost of government borrowing. The RBI's credit policy during the 1970s sought to finance economic growth and ensure price stability by controlling credit expansion. The bank rate of interest was becoming less effective as an instrument of monetary policy, owing to the rapid increase in the deposits of commercial banks under deficit financing. Furthermore, open-market operations had a limited scope, owing to the absence of a well-developed market for government securities. Consequently, the 1970s saw the introduction of laws empowering the RBI with greater flexibility to vary the reserve requirements of commercial banks, and introduce selective credit controls. The RBI also assumed major exchange-rate control functions under the Foreign Exchange and Regulation Act of 1973 (Reserve Bank of India, 2005b).

The faster expansion of money supply owing to the needs of deficit financing during the 1980s meant that Indian policy makers and monetary authorities began focusing on developing a broader approach to determine the size and growth of money supply. Following the recommendations of the 1986 Chakravarty Committee, the monetary policy framework came to view M3 as the anchor to be targeted in accordance with the desired growth of output and acceptable inflation. The late 1980s also saw extensive efforts to develop the Indian money market. The initiation of liberalization in 1991 shifted the focus of monetary policy towards the development of financial markets, deregulation of the financial sector, and an emphasis on indirect instruments (such as open-market operations and repos), rather than direct instruments of monetary policy (Reserve Bank of India, 2005b). While an in-depth discussion is beyond the scope of this article, it could be argued that this shift and the progressive liberalization of capital flows in India have made financial stability (inflation targeting and exchange-rate management) a more explicit objective, and constrained the ability to frame monetary policy (for

instance, through economic growth-inducing interest rates) in accordance with national priorities of output and employment.

The post-liberalization years have also seen efforts by the RBI to make the Indian payment and settlement systems more compliant with the *Core Principles for Systematically Important Payment Systems* (Bank for International Settlements, 2003), and reduce settlement and systemic risks through the development of the regulatory institutional framework. Deregulation, and the liberalization of capital inflows in India in the late 1990s and 2000s, produced strains on the monetary targeting framework that had been pursued in the 1980s. The RBI has switched to a “multiple indicators approach” since 1998–99, under which policy perspectives are determined on the basis of indicators such as interest rates in different financial markets, data on currency and credit provided by banks and financial institutions, trade and capital inflows, output data, exchange rate, inflation rate, and so forth (Reserve Bank of India, 2005b).

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See also:

Inflation; Inflation targeting; Interest rates setting; Lender of last resort; Monetary targeting; Money supply; Open-market operations; Policy rates of interest; Repurchase agreement; Reserve requirements.

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Reserve currency

A “reserve currency” is a currency that is held by many governments and institutions in a notable quantity, which constitutes part of their foreign-exchange reserves. It is held by central banks to pay their countries’ (external) debt. The reserve currencies in use in any historical period are usually widely accepted and they make the pricing of goods and services in the global market less cumbersome, thereby fostering trade. Major global commodities priced in reserve currencies include gold and oil.

No reserve currency is permanent, as one can see in the different currencies used in different historical periods and with different percentages of foreign-exchange reserves. Examples include the seventeenth-century use of Dutch guilders, the Roman denari of the Middle Ages, Chinese Liang and Greek drachma of the fifth century BC and, more recently, pounds, euros and US dollars (Persuad, 2004; Eichengreen, 2005; Schenk, 2009). The US dollar has been the main reserve currency since the Bretton Woods regime. This began as gold convertibility (US dollar reserves being sold at a fixed price for gold) as a result of the emergence of the United States as the major economy at that time. Despite the collapse of the Bretton Woods regime, the US dollar has remained a major reserve currency.

For a currency to be used as a reserve currency, there are some determining factors to be considered. Chinn (2012) lists them as follows:

- (1) The pattern of output and trade: the country's currency has to have a large share in international trade and finance.
- (2) Financial markets: capital and money markets in the country whose currency is being considered must be open and free of controls and that country's economy must also be deep and well developed.
- (3) Confidence in the currency: the exchange rate of the currency must not fluctuate erratically. Many reserves are held in the form of government bonds not just cash. Hence, to be a reserve currency, these government bonds have to be tradeable across borders without fear of default risk.
- (4) Network externalities: other countries have to be willing to and actually use the currency. If a currency is widely used to invoice trade, there is a higher chance of that currency being used to invoice financial transactions as well. Regardless of its intrinsic value, wide acceptability is key in the consideration of a reserve currency. Like a domestic currency, the willingness of other people to accept a currency is a determining factor considered in a reserve currency.

There are several benefits and costs accruing to a country whose currency is used as a reserve currency and also to countries using it.

Among the benefits of a reserve currency, Chinn (2012) includes seigniorage, lower government and private borrowing costs, and other nonpecuniary benefits such as the international prestige accrued to a country from having its currency used as a reserve currency. Let us elaborate on some of these benefits briefly.

As regards seigniorage, this is a spending power re-allocated to the monetary authority issuing a reserve currency and will also be extended to the country as a whole. Black (1989, p.314) explains seigniorage benefits as “the excess of the opportunity cost of capital over the cost of providing the fiduciary asset” (in this case, the fiduciary asset is the reserve currency). If a country issues a reserve currency, its government can enjoy the ability to buy goods, services and assets from other countries using its own currency (non-reserve-currency countries cannot do this). Furthermore, reserve currencies allow their issuing countries to “sell both private and government debt in their own currency, and at a lower interest rate” (Chinn, 2012, p. 17). In addition, reserve currencies have the attributes of a natural monopoly, and using countries find it easier to trade with the currency that most countries use rather than incurring the extra transactions costs of trading with another currency (Persuad, 2004).

As regards the costs of reserve currency, Chinn (2012) points out two aspects:

- (1) Some countries might peg their currency to the reserve currency, which makes them use their own domestic currency as a macroeconomic shock absorber. For example, Aizenman and Hutchison (2010) show that during the global financial crisis that erupted in 2008, the fear of reserve losses made emerging markets depreciate their currency instead of reducing reserves to foster economic recovery and stability. This is because they feared that losing reserves too fast might propagate a run on the remaining reserves. Wray (2003) explains the danger of a reserve currency with

respect to exchange-rate pegging: by pegging to a reserve currency, the currency user would be allocating a part of its sovereignty to the issuing country. Also, the issuing country could suffer depression of aggregate demand and losses of jobs and industries if it does not adopt a policy to ensure full employment at home.

- (2) Greater financial integration will make it easier to transmit external shocks to the reserve currency economy. Countries with a high volume of reserve currency in their foreign reserve will be more exposed to shocks that the issuing currency faces. As the world is a global market, Aizenman and Hutchison (2010) show empirically that the higher the total-foreign-liabilities-to-GDP ratio a reserve currency country had, the more vulnerable it was to the global financial crisis that burst in 2008. If so, then a country with a relatively high volume of reserve currency (US dollars, which has the highest percentage in the currency composition of official foreign-exchange reserves) was more susceptible to experience the financial crisis that started with the housing bubble in the United States.

We can add a third aspect: a currency used as a reserve currency is prone to exchange-rate appreciation as a result of an increase in the demand for that currency. This would result in the costs of its exports being higher for other countries and thus a decrease in its exports. Though the exchange-rate appreciation will benefit imports, the total effect on trade will depend on the percentage of exports and imports.

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See also:

Bretton Woods regime; Dollar hegemony; Financial crisis; Housing bubble; International reserves.

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Reserve requirements

Reserve requirements refer to the legally mandated retention of a minimum portion of a specific type of liability issued by depository institutions in a specific type of

asset on premises, at another depository institution, or with the monetary authority. Required reserves are analytically and legally distinct from excess reserves, which refer to the percentage of liabilities that depository institutions elect to hold of their own volition.

Additionally, it is important to distinguish clearly between the reserves of depository institutions and their reserve balances: the former is identified with the notion of a depository institution retaining a percentage of its total liabilities on its balance sheet in a specific asset class for any number of reasons, while the latter connotes simply the most common asset in which those reserves are held – that is, a deposit account held directly or indirectly at the central bank.

Today, reserve requirements are not imposed in all monetary systems, nor are they uniform across the systems in which they are extant. The implementation of a required reserve regime requires, first, the identification of which liabilities are subject to reserve requirements (are “reservable”), as well as the classification of what portion (generally a percentage) of those reservable liabilities must be retained. Reservable liabilities represent the base against which required reserve ratios are multiplied in order to calculate institutional reserve requirements. Given that depository institutions avail themselves of many and disparate sources of funding, the composition of the reserve base as well as the percentage that must be held in reserve against reservable liabilities is often associated with the characteristics of a liability, such as its size, maturity or liquidity; with greater coverage required against shorter-term, less-liquid liabilities.

Second, the eligible assets in which the required reserves are to be held must be stipulated. The preference of monetary authorities today is commonly for highly liquid assets denominated in their own currency so as to facilitate the implementation of monetary policy. Thus, in post-gold-standard monetary systems, eligible assets are almost exclusively deposits held directly or indirectly at the central bank, but may also less commonly be satisfied with vault cash or its equivalent.

In addition to determining reservable liabilities and required reserve ratios and the assets eligible to discharge reserve requirements, a required reserve regime must also adopt a programme for prescribing the calendar periods during which the amount of reserve requirements are computed and must be maintained. The period of time over which reserve requirements are computed and maintained varies with the monetary system, with the computation of reserve requirements taking place over single or multiple days and the maintenance period for required balances extending for multiple days or even weeks. Each maintenance period corresponds to a computation period, both of which may contain a provision for the averaging of balances. Provisions allowing for an averaging of end-of-day balances during the maintenance period may contribute to a reduction in interest-rate volatility in key financial markets, thus making central bank policy implementation less onerous under interest-rate targeting policy regimes (Fullwiler, 2008). As O’Brien (2007, p.6) notes, the relationship between computation and maintenance periods gives rise to one of three forms of a reserve requirement system: (i) a lagged system, in which the maintenance period begins after the end of its corresponding computation period; (ii) a contemporaneous system, in which computation and maintenance periods coincide or overlap to a great extent; or (iii) a hybrid or semi-lagged system in which the maintenance period starts some time during its computation period. Finally, imposition of a reserve requirement regime necessitates establishment of

the terms upon which required balances are remunerated should they be satisfied or the penalty assessed for non-compliance. It is also possible, as is the case within the Federal Reserve System, that it is permissible to “carry over” reserve requirement deficiencies or surpluses. However, such a provision is unique in the Federal Reserve System and serves as evidence that the specific operational arrangement a reserve requirement regime assumes is tied to the historical evolution and current exigencies of the financial system of which it is part.

Gray (2011) identifies three main reasons for the imposition of a reserve requirement regime, the first of which is associated with the traditional prudential notion of reserve requirements. It is argued that the imposition of reserve requirements serves to allay concerns regarding depository institution solvency and liquidity during financial crises by ensuring that banks either are in possession of or are able to obtain the funds necessary to redeem liabilities. However, today, the existence of deposit insurance schemes and central bank liquidity assistance has largely obviated the necessity of required reserves in forestalling bank runs of this fashion. The other reasons identified by Gray (2011) concern the usage of reserve requirements in effecting monetary policy. While some hint of the use of reserve requirements for monetary policy implementation is implicitly built into prudential reserve balances, it is with respect to the use of reserve requirements to implement monetary control that it is most familiar. Conventional wisdom and generations of textbooks have asserted that the monetary authority is able to control the money supply through manipulation of reserve requirements. By decreasing (increasing) the ratio of required reserves to reservable liabilities, it is argued that “fully loaned up” depository institutions will increase (decrease) their assets and, through the money multiplier, thus impact the stock of money in an amount equal to the reciprocal of the required reserve ratio. The exogeneity of the money supply has long been contested by endogenous money theorists such as Moore (1988) as well as by central bankers such as Goodhart (1989) and more recently by Bindseil (2004). Today, the profession is slowly and begrudgingly accepting that, under the current structure of monetary systems and available techniques of policy implementation, the money supply is in fact endogenously determined.

Finally, it can be said that reserve requirements are effective for liquidity management purposes. This indeed appears to be true. In certain cases, the imposition of reserve requirements is effective in making the implementation of monetary policy more efficient by smoothing the demand for reserve balances on the part of depository institutions.

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See also:

Basel Agreements; Capital requirements; Central bank money; Endogenous money; Federal Reserve System; Financial crisis; Lender of last resort; Money multiplier; Money supply; Settlement balances.

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Ricardo, David

David Ricardo (1772–1823) was the greatest of the English classical economists. He was born in London into a Sephardic Jewish family with connections in Amsterdam, and made a fortune as a financial trader and government loan contractor. In 1815 he retired to an estate in Gloucestershire, where he lived the life of a country gentleman, studied political economy and wrote his great *Principles of Political Economy and Taxation*, published in 1817 (King, 2013, chs 1–2). Of the ten volumes of Ricardo's *Collected Works* (Ricardo, 1951–55), the most relevant are volumes I (the *Principles*) and IV (which contains his pamphlets on money).

Ricardo's early interest in monetary policy was responsible for his first publications in political economy, the pamphlets of 1809–10. He was a forceful critic of government policy, and especially antagonistic towards the Bank of England. Ricardo was a consistent advocate of the quantity theory of money and a strong supporter of Say's law, denying the possibility of "general gluts". This committed him to the doctrine of the neutrality of money and led him both to reject any role for active (countercyclical) monetary policy and to anticipate twenty-first century political orthodoxy in his advocacy of an "independent" central bank (see Sayers, 1953; Green, 1992; King, 2013; chs. 5–6; for an alternative view, see Davis, 2005; and Arnon, 2011).

The peculiar status of the Bank of England was a constant worry to Ricardo. It had been set up in 1694 as an instrument to raise credit for the government, and was a privately owned company that nevertheless enjoyed many of the public responsibilities, and privileges, of a central bank, including a monopoly over note issue and a semi-monopoly on banking in the London area. The Bank used its connections in Parliament to ward off competition, in the best tradition of rent-seeking under the oligarchic system criticized by contemporaries as "old corruption" (Mokyr, 2010).

The Bank of England was crucial to government finance, especially in time of war (Bordo and White, 1991). Britain was at war with revolutionary France for most of Ricardo's adult lifetime, and the problems of war finance, government debt and monetary policy preoccupied him. He was a classical liberal, who advocated small government, low taxation and far-reaching political reform to eliminate the adverse effects of "old corruption", which included the Bank's excessive monopoly profits. These profits were derived in large part from overissue of its notes after their convertibility into gold was suspended in 1797; Ricardo believed this to be the principal cause of the wartime inflation.

He took an active part in the "bullion controversy" in 1809–10. The "anti-bullionists" argued that a rising price level could not be attributed to excessive issue of paper money by the Bank of England, which was simply discounting "real bills" in order to finance profitable investment projects undertaken by private entrepreneurs. Ricardo was

prominent among their “bullionist” opponents, who maintained that this was inviting rapid inflation and depreciation of the currency.

As a newcomer to political economy, Ricardo was not responsible for the doctrines of the 1810 *Bullion Report*, which rejected the “real bills” doctrine, but he achieved a considerable reputation as a pamphleteer and propagandist, both then and subsequently. His 1816 pamphlet, *Proposals for an Economical and Secure Currency*, was especially influential. Here Ricardo proposed that a paper currency should continue, but that Bank of England notes should be backed by gold in order to prevent overissue. To economize on the use of gold, banknotes were to be redeemed only for gold bars but not for coins. Parliament adopted Ricardo’s “Ingot Plan” in 1819, but fears of forgery led to second thoughts, and when convertibility was finally implemented in 1821, gold coins replaced small denomination banknotes in circulation.

Ricardo was always strongly opposed to the Bank’s privileged status, and after his election to Parliament in 1819 he frequently criticized it in Commons debates on the banking system and the conduct of monetary policy. His own alternative was set out in a pamphlet, *Plan for a National Bank*, which was published posthumously in February 1824; the essence of Ricardo’s proposals can also be found in chapter 27 of his *Principles*. In the *Plan* he set out a 16-point plan for removing the Bank of England’s power to issue paper money. It was to be replaced by a National Bank, which would act as banker to all government departments but would be prevented by law from lending to private individuals or companies. Its five commissioners were to be appointed by the government, but removable only by a vote of both Houses of Parliament. This independence, he believed, would make it possible for them to avoid the evils of both excessive government expenditure and the inflationary increase in paper money.

While the Act of Resumption of 1819 restored convertibility, and effectively ended the bullionist controversy, it also led to serious deflation as a result of the contraction in the money stock. Ricardo himself was attacked as the cause of all the country’s ills, but he never recanted, instead attacking the Bank of England for its incompetent handling of the return to convertibility.

JOHN E. KING

See also:

Banking and Currency Schools; Bank of England; Bullionist debates; Central bank independence; Fiat money; Ingot Plan; Money neutrality; Quantity theory of money; Real-bills doctrine.

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Rist, Charles

Charles Rist (1874–1955) is an important economist in the monetary and financial history of the inter-war period. He studied Law and Economics in Paris and became Professor of Political Economy at Montpellier University in 1899, before accepting a chair at the University La Sorbonne in Paris in 1913. He was interested in social issues and was progressively introduced to economic analysis through his collaboration with Charles Gide, which culminated in the publication of the first edition of their *Histoire des Doctrines Économiques depuis les Physiocrates jusqu’à nos Jours* (Gide and Rist, 1909). He then began to develop and publish his own views on economic and monetary theory, and acted as an adviser on monetary and financial issues to many governments and monetary authorities during the inter-war period.

In the early 1920s, at a time when France hesitated between deflation and depreciation, he published *La Deflation en Pratique* (Rist, 1924), which analyses the post-First-World-War deflation experience in the United Kingdom, the United States, France and Czechoslovakia. He expresses regret that the United Kingdom did not choose a more gradual type of deflation and did not maintain a sufficiently elastic credit supply in order to avoid recession. He developed an original conception of monetary and financial stabilization that he would then apply to France.

Rist’s conception can be summarized within four principles:

- (1) monetary stabilization is necessary in order to gain confidence and increase economic activity;
- (2) there should be a real anchor, such as gold, to stabilize exchange rates at a level consistent with the corresponding decisions in partner countries;
- (3) financial stability (and especially budget equilibrium) is a condition to achieve and maintain monetary stability; and
- (4) based on the achievement of the first three principles, any “radical” deflation that could generate recessionist effects should be avoided.

In 1922, Charles Rist acted as a representative of the Carnegie Foundation in an inquiry into Austria’s economic situation, which was experiencing a harsh recession and an accompanying monetary crisis. His comments and prescriptions were far from orthodox. He recommended the international community help Austria to recover and to return to public finance soundness, and to recover its pre-war position as an economic and commercial centre.

Rist expressed the same pragmatic view with respect to France. After his active participation in the *Comité des experts* (this committee, created by Raoul Perret of the 1926 centre-left government, was devoted to finding a solution to the fiscal and monetary crisis in France), Charles Rist was appointed Deputy Governor of the Banque de France by Emile Moreau, who in 1926 had just been nominated Governor of the Banque. With

Moreau and Quesnay, Rist was one of the initiators of French reforms and the Poincaré stabilization. Within a few months of the triumvirate's stabilization without deflation, the French franc began to appreciate against the pound sterling and the US dollar. Following this *de facto* stabilization, made possible by a set of reforms of monetary and fiscal policies, and enhanced independence of the Banque de France, the French franc was pegged to gold *de jure* at a new and depreciated parity in 1928. During this period, Rist represented the Banque de France at many international meetings, alongside Benjamin Strong, Montagu Norman and Hjalmar Schacht.

In 1929 Charles Rist resigned from his position at the Banque de France, and embarked on a series of missions related to various central banks in Europe, which all considered him the "money doctor" who had achieved stabilization of the French franc without deflation. His activities related to the National Bank of Romania involved his stabilizing the Romanian leu and pegging it to gold in 1929 (again at a depreciated exchange rate) and endeavouring to make this stabilization definitive by imposing financial standards on the Romanian government and its monetary authorities. The effect of the Great Depression, but also the reluctance of Romanian authorities to accept the restrictive measures, transformed the plan's temporary success into a definitive failure of the Romanian leu to maintain its new parity. As happened to other currencies in Europe, in 1932 the Romanian leu became inconvertible.

Rist had also been appointed adviser to the Turkish government, which was trying to obtain a foreign loan to settle the Ottoman debt. As in Romania, Rist suggested carrying out disinflation policies to attract foreign capital to Turkey. The Turkish authorities were unable to follow Rist's advice: once again, the French money doctor had tried to apply a less pragmatic solution to a foreign economy's problem than he had advised in the French case. And once again, he failed.

While the Great Depression was challenging the fragile international monetary order, in the 1930s Charles Rist became one of the last advocates of the gold (exchange) standard, which most other practitioners had decreed inconvenient in that fragile environment and unlikely to initiate recovery. Charles Rist became an opponent of the French franc devaluation after those of the pound sterling in 1931 and the US dollar in 1933.

Rist's influence on public policy declined with this succession of bad choices, and he returned to academia before embarking on a new career as administrator in several industrial and financial companies. His academic activity included, with the support of the Rockefeller Foundation, establishment of the Institut Scientifique de Recherches Économiques et Sociales, the first French statistics institute. He published a book setting out the theoretical background to his practical choices related to monetary policy. His *Histoire des Doctrines Relatives au Crédit et à la Monnaie de John Law à nos Jours* (Rist, 1940) is written by a non-orthodox advocate of gold, underestimating Keynes and Cassel, but also stimulating the interest of the reader in authors such as Tooke, Thornton and Knapp, who expressed completely contrasting views to the main advocates of gold that previously inspired his advice and actions.

DOMINIQUE TORRE

See also:

Banque de France; Financial instability; Money doctors; Norman, Montagu; Quesnay, Pierre; Schacht, Hjalmar Horace Greeley; Strong, Benjamin.

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Rules versus discretion

A monetary policy based on rules consists of setting a policy target for the mid or the long run and sticking to it. For instance, it may consist of setting a growth rate of the money supply of 2 per cent yearly. A discretionary monetary policy, by contrast, consists of responding to the changing economic events, period after period, for example by increasing or decreasing the key interest rate or changing the monetary base. Such a policy will depend on how the monetary policy committee of the central bank assesses the current economic situation, on its expectations about its future evolution, and on the extent to which its instruments are capable of influencing the economic situation.

The debate opposing rules to discretion can be traced back to the 1840s, when the Banking School opposed the Currency School. The latter argued that the quantity of money should vary exactly as if all the money were gold, and that the central bank should therefore adopt stringent monetary rules to control the growth of the money supply. The members of this school, including David Ricardo, believed in the quantity theory of money and hence that creating too much money would lead to inflation. By contrast, the members of the Banking School thought that the quantity of money in circulation should not primarily be based on a metal, but rather on the needs of economic agents. Its proponents, like Thomas Tooke, thought that money is created mainly by commercial banks to accommodate demand for it, so that monetary policies had to be discretionary.

The victory of the “Keynesian synthesis” after the Second World War led to the general acceptance that monetary policy should act in a discretionary way in order to be consistent with discretionary fiscal policies. In order to attain the four main objectives of macroeconomic policies (price stability, high economic growth, low unemployment rates and an equilibrated balance of payments), the policy mix had to be consistent, both in periods of “stop” (restrictive policies) and in periods of “go” (expansionary policies). In their discretionary actions, central bankers had to take into account the asymmetric nature of monetary policies: they are more effective in slowing down economic growth in expansions than stimulating economic growth in recessions.

During the 1950s and 1960s, Milton Friedman and the monetarists developed a new set of arguments in favour of stringent rules. Some of these arguments (see for example Friedman, 1972) were about the informational constraints facing policy makers, the long and variable time lags involved between the decision and implementation of active countercyclical policy, the uncertainty regarding the size of the money multiplier, and the destabilizing nature of shifts in monetary policy owing to the influence of public opinion and political pressures. As a result, Friedman (1960) proposed that central banks adopt the “*k*-per-cent rule”, according to which the money supply should be increased by the central bank by a constant percentage rate every year, irrespective of business cycles.

Kydland and Prescott (1977) reformulated the case against discretionary policies in “New Classical” terms. In a theoretical model where the central bank is engaged in a strategic game with private agents having rational expectations, the only way to avoid an inflationary bias would be that monetary authorities commit to a policy rule independent of the business cycle and consistent with price stability.

Monetarists and New Classical authors all assume that the quantity theory of money holds and that the central bank sets the quantity of money exogenously. The arguments developed by them led to the adoption of stringent rules in developed countries.

In 1993, an influential paper published by Taylor changed the kind of rule adopted later on by central banks (Taylor, 1993). Using a Taylor rule implies that the central bank sets the interest rate in the short run rather than the stock of money. Under “New Consensus Macroeconomics” (NCM) adopted by multiple central banks from the middle of the 1990s up to 2007, the Taylor rule is viewed as a “guideline” for monetary policy rather than a rigid rule.

Since the 2007 subprime crisis burst, monetary policies have been discretionary again. In particular, quantitative easing and qualitative easing can only be carried out on a very discretionary basis. It is widely recognized by central banks that the Taylor rule cannot be used under the current circumstances, mostly because the interest rate has reached the “zero lower bound”, but also because the balance sheet and communication channels used under these “non-conventional policies” can only operate in a discretionary way.

In fact, whether economists rely on rules or prefer discretion is often closely related to their views about uncertainty. If uncertainty is the same thing as risk (as in neoclassical economics), a distribution of probability can be constructed for the various events, so that economists can rely on their models and adopt rules. By contrast, if there is radical uncertainty, as underlined by Keynes (1921), the trust one can put into a model is limited and discretionary monetary policies may be preferable.

Those economists who believe that radical uncertainty is a major feature of modern capitalist economies can sometimes be opposed to discretion. This is the case for many post-Keynesian economists. Wray (2007) argues that raising the interest rate counter-cyclically would be inefficient, because it could stimulate spending by raising aggregate demand, disrupt financial markets, and be in favour of the *rentiers* that Keynes wanted to euthanize because this policy increases their interest payments. These post-Keynesian economists are in favour of “parking it” rules, an approach in which the central bank sets real or nominal interest rates at specific levels and changes them only sparingly (see Rochon and Setterfield, 2011). There are three kinds of “parking it” rules: the Smithin Rule (keeping real interest rates close to zero), the Kansas City Rule (setting the nominal interest rate at zero) and the Pasinetti Rule (setting the real rate of interest equal to the rate of growth of labour productivity).

DANY LANG

See also:

Banking and Currency Schools; Central bank credibility; Credibility and reputation; Effective lower bound; Financial crisis; Friedman rule; Interest rates setting; Monetary policy objectives; Monetary targeting; Money multiplier; Money supply; Quantitative easing; Quantity theory of money; Ricardo, David; Taylor rule; Time inconsistency.

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Schacht, Hjalmar Horace Greeley

Hjalmar Horace Greeley Schacht (22 January 1877 – 3 June 1970) was a German economist and banker. An endorser of Adolf Hitler's Nazi party, he was President of the German Central Bank (Reichsbank) on two occasions, from 1923 to 1931 and from 1933 to 1939, and served as the Reich's Economic Minister from 1934 to 1937. Among other reforms, he contributed to the German currency reform in 1924 and, consequently, to the stabilization of the German price level through the introduction of a new (temporary) currency called Rentenmark. Furthermore, he was significantly involved in the foundation of the Bank for International Settlements (BIS) in Basel, which he thought of as "his" bank (Weitz, 1998). After the Second World War, he stood trial for crimes against peace, but was eventually acquitted. He also published several pieces of his own research work on economic and monetary subjects.

Schacht is still known for the bilateral clearing agreements stipulated by Germany during his term as Reich's Economic Minister and Reichsbank President. These arrangements "were concluded with a number of countries, especially in central Europe and South America, in which German purchases were credited against offset purchases by foreigners in German markets" (Neal, 1979, p. 391). As Wolfe (1955, p. 401) points out, the "Schachtian system" (or "Schachtian Mercantilism" (see Momtchiloff, 1954)) aimed at cutting off money flows from German international transactions and fighting shortages of exchange reserves. More precisely, these bilateral clearing agreements, which were part of Schacht's New Plan (Neuer Plan),

rested on two pillars: an import-licensing scheme together with subsidiary controls on exports, and bilateral payments agreements with Germany's main trading partners [. . .]. In its simplest form, the two trading partners open accounts for each other in their central banks, into which each pays for its imports from the other in its local currency. The balances in both accounts can only be cleared [. . .] by the exchange of goods, not money. [. . .] No actual exchange of national currencies took place. (Skidelsky, 2001, pp. 190 and 229)

Credit balances of one country for its exports to another one could be used merely to import from the latter nation. Nonetheless, individual exporters in both countries were paid in their national currency from the corresponding central bank as far as importers made comparable payments. Because of their reserve-saving characteristics and the "system of controls on imports" (Chown, 2003, p. 147) set up to the advantage of Germany, these arrangements have also been defined as "barter trade" (Tschoegl, 1978, p. 4) as well as "inherently and fundamentally discriminatory" (Ruggie, 1992, p. 569).

Schacht is also worth mentioning because of his (nowadays forgotten) plan to establish an International Clearing House, whose members and shareholders would have been the central banks of Belgium, England, France, Germany, Italy, Japan and the United States of America. As Costigliola (1972, p. 607) reports, the idea for this International Clearing Bank arose in 1929 and aimed at financing global economic development and trade. According to Schacht's proposal, Germany would deposit bonds with the

International Clearing House for the value of 5 milliard Goldmarks representing “a direct and unconditional obligation of the German Government. These bonds [would have] to become the property of the clearing house. The bonds [would] not [have] to bear interest but [would] be redeemed in course of (X) years by annuities on a decreasing scale” (Schacht, 1929, p. 1). According to Schacht’s scheme, the International Clearing House would grant credits to central banks and governments, as well as other public authorities or any borrowers benefiting from public guarantees. Legend has it that an (unwritten) clause prescribed “that Germany itself would have no access to Clearing House credits. [. . .] The American delegation saw in it a device on the part of Schacht to expose Germany’s neighbour and creditor countries to inflation, by which Germany, the only country unaffected, would correspondingly benefit” (Lüke, 1985, p. 73). Although Schacht’s plan was unanimously considered inflationary (Simmons, 1993, p. 380), there is little doubt that John Maynard Keynes was inspired by it in formulating his own proposals for an International Clearing Union, which he presented at the Bretton Woods conference (New Hampshire, 1–22 July 1944), as Lüke (1985, p. 76), Skidelsky (2001, p. 194) and Figuera (2002, p. 4) have pointed out. After all, the British economist himself is reported to have said that his “proposals [. . .] lay no claim to originality” (Horsefield 1969, p. 21).

EDOARDO BERETTA

See also:

Clearing system; Credit guidance; International settlement institution; Keynes Plan; Reichsbank; Rist, Charles.

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Settlement balances

Settlement balances are the funds maintained by a direct participant of a settlement system at an account held at a central bank or a central securities depository, or with a central counterparty or any other institution acting as a settlement agent for the purpose of discharging its obligations to other system participants. If any system participant runs short of settlement balances to discharge its payment obligations, this could lead to settlement failure. System rules and strict admission criteria for system participants of a settlement system ensure that the risk of settlement failure is minimized.

It was not common among the early banks to accept notes issued by other banks. As trading and financial systems developed, banks began to accept claims on other banks, which required clearing and settlement arrangements. In early banking systems, most clearing and settlement mechanisms were periodic bilateral settlements of net clearing balances and the settlement was usually in specie. However, settling the obligations directly in specie was inconvenient and costly. This motivated bankers to switch to assets convertible to specie, sometime during the eighteenth century (Norman et al., 2011). In those countries where there was an established central bank, the obvious choice was the legal tender issued by the central bank. This process, nevertheless, involved a significant credit risk and did not work well with two institutions that differed in their creditworthiness or that were located far from each other.

Formal clearing and settlement arrangements, where a trusted third party acted as a settlement agent, evolved in England by the end of the eighteenth century and in the United States by the mid 1820s as a way of minimizing credit risks (Norman et al., 2011). Participating banks were required to maintain settlement accounts with this central agency to guarantee timely discharging of their payment obligations and to collect their receipts. The Bank of England started to provide settlement accounts for the banking sector as “[u]ltimate risk-free means of discharging payment obligations between parties” in the mid nineteenth century (Bank of England, 2010, p. 4).

A parallel development in England from the middle of the eighteenth century was the evolution of corresponding banking arrangements where country banks began to maintain settlement accounts with a bank located in London in order to facilitate the acceptance of its claims. In the United States, corresponding banking arrangements evolved in the 1860s facilitating inter-regional settlement of payments. As national banks in the United States were obliged to hold reserves in their regional “reserve cities” by that time, the same funds were used as settlement balances for clearing their payment obligations (Norman et al., 2011). At present, corresponding banking arrangements are used mainly for settling cross-border payments. The settlement accounts maintained with a foreign bank for this purpose are known as “nostro” accounts.

Maintaining settlement balances with a settlement agent or a corresponding bank, while facilitating the smooth settlement of payment obligations, involves a significant opportunity cost to these banks. Multilateral netting arrangements developed during the nineteenth century helped banks to minimize this cost by lowering the amount of settlement balances to be maintained in their settlement accounts. With multilateral netting, each bank with a negative overall value of payment obligations to all other banks for the day would pay in its net position to the settlement agent. The settlement agent would

credit the settlement account of each bank with a positive overall value of payment obligations.

Today, almost all large-value payment systems and securities settlement systems use settlement balances at a central bank account to discharge the payment obligations of participants. In addition, some retail payment systems are also settled using central bank money. Core principles for systemically important payment systems published by the Committee on Payment and Settlement Systems of the Bank for International Settlements in 2001 recommend that “[a]ssets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk” (Bank for International Settlements, 2001, p. 3).

In many countries, commercial banks are obliged to maintain a minimum reserve with the central bank, which primarily serves as a monetary policy tool. Often, banks are allowed to use these reserves as settlement balances when the central bank acts as the settlement institution. When a bank faces a temporary liquidity shortage, the central bank has the option to provide additional liquidity very quickly across these accounts.

Gross settlement systems, while minimizing settlement risk, require maintaining larger amounts of settlement balances than in an end-of-day net settlement system (Martin, 2005). Intraday liquidity arrangements by central banks and innovative technical solutions (such as the gridlock resolution algorithms) help to minimize the opportunity cost of additional settlement balances required in gross settlement systems.

VIDHURA S. TENNEKOON

See also:

Cash; Central bank money; Clearing system; Reserve requirements; Settlement system.

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Settlement system

A settlement system is a system used to facilitate the settlement of transfers of funds, assets or financial instruments, usually comprising a settlement infrastructure, system participants, settlement accounts and a set of system rules. It may include also a securities depository.

There are two categories of settlement systems: (i) payments settlement systems, which only deal with transfers of funds; and (ii) securities settlement systems, which also deal with transfers of assets or financial instruments.

Settlement systems are operated by central banks, securities depositories and other

financial institutions. Only the system participants can directly access a settlement system. Others have to come through a system participant who acts as a settlement agent to use the services of the settlement system.

Unlike cash transactions, transactions that involve non-cash payments (that is, checks, credit cards, debit cards and other electronic payments) are not complete until the final payment occurs at a payment settlement system. This is because the completion of a transaction requires a final and irrevocable transfer of assets between the parties involved. While a cash transaction involves the transfer of an asset (banknotes and coins) at the point of transaction, a non-cash transaction does not. Checks, credit cards, debit cards and other non-cash modes of payment are all payment instruments linked to a separate asset, usually an account at some financial institution. A non-cash payment is not final until the asset backing the payment instrument used is transferred from the payer to the recipient.

Payment settlement systems are grouped in several ways according to their characteristics. A real-time settlement system can complete the final, irrevocable and unconditional settlement of a payment almost instantaneously, if the payment instruction is received during its operating hours. A deferred settlement system processes settlement instructions with a delay, often at the end of the day. Gross settlement systems settle transactions one by one, while a large number of transactions are processed together at the same time in net settlement systems (Martin, 2005).

Settlement systems are also categorized as large-value payment settlement systems and retail payment settlement systems according to the value of a typical transaction settled by the system. Real-time gross settlement (RTGS) systems feature both real-time and gross settlement characteristics, and are considered the least risky platform for making a large-value payment. Most retail payment settlement systems (including check, credit card and debit card clearing systems) are deferred net settlement systems (Cronin, 2011). A bilateral settlement system settles transactions between two system participants at a time. A multilateral settlement process settles the payment obligations of all system participants simultaneously, usually on a net basis.

The participants of a settlement system maintain settlement accounts for the purpose of settlement, often with the central bank and sometimes with a large commercial bank. The execution of a payment instruction involves the transfer of funds across these accounts. If any system participant runs short of settlement balances to discharge its payment obligations, it could lead to settlement failure. System rules and strict admission criteria for system participants ensure that the risk of settlement failure is minimized (Bank for International Settlements, 2001a, 2001b).

The settlement procedure is more complex when multi-currency or cross-border transactions need to be settled and may pass through multiple settlement systems sequentially. Payment-versus-Payment (PvP) settlement protocols integrate two or more settlement systems to minimize risks in multi-currency and cross-border transactions.

A securities settlement system facilitates the settlement of transfer of financial assets (securities) in addition to the transfer of funds. In most cases, the securities settled by a settlement system are electronic records at a central securities depository, also known as “scripless securities”. A real-time scripless securities settlement system minimizes the settlement risk by providing a Delivery-versus-Payment (DvP) securities settlement protocol in which the funds are transferred simultaneously with the transfer of the security.

However, not all securities settlement systems are real-time or facilitate DvP mechanisms (see European Central Bank, 2007). The time period that elapses from the trade date, when two parties first agree on a securities trade, until the final settlement of the trade is called the settlement cycle, usually expressed in a number of business days. In some settlement systems a provisional settlement may precede the final non-reversible settlement.

Settlement systems, payment settlement systems in particular, are of strategic interest to most central banks around the world (Norman et al., 2011). This interest stems from their responsibilities for financial system stability and also as a result of the complex operational process for the implementation of monetary policy. Central banks are increasingly stepping in to own and operate systemically important settlement systems in addition to overseeing the settlement services provided by other operators. In many cases, balances at an account with the central bank are used as the settlement asset even when a settlement system is operated outside the central bank.

VIDHURA S. TENNEKOON

See also:

Cash; Central bank money; Clearing system; Reserve requirements; Settlement balances.

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Shadow banking

Shadow banking was at the centre of the two "heart attacks" suffered by international capital markets in August of 2007 and September of 2008. Yet, despite the importance of shadow banking, there is little consensus on even the most basic of considerations. What is it? What does it do? Who does it?

One of the first systematic attempts to reveal the operations of shadow banking was made in 2010 by Pozsar et al. (2010) from the Federal Reserve Bank of New York (FRBNY). The authors state that "we use the label 'shadow banking system' for this paper, but we believe that it is an incorrect and perhaps pejorative name for such a large and important part of the financial system" (ibid., p. 4). Cetorelli and Peristiani (2012, p. 48), also writing for the FRBNY, are more forthright in addressing the term and why its use is warranted: "intermediation has moved off the banks' balance sheets and into the shadows".

The fact that the term “shadow banking” is being debated five years after it first seized up reveals the extent to which the evolution of shadow banking has outpaced academic investigation. A further pertinent fact is that the most relevant research regarding shadow banking has been conducted by long-time champions of financial sector expansion, such as the International Monetary Fund (2008), the Organisation for Economic Co-operation and Development (2011), the Bank for International Settlements (2013), and the FRBNY – an agency with regulatory duties that failed to prevent the seizing-up of the North Atlantic shadow banking system. While these studies offer important insights into the specific operations of a very complex financial system, they exclusively focus on the flows and not the stock of the system, and never directly address the core issue of how shadow banking creates *ex-nihilo* credit-money.

As debate continues over the very name of shadow banking, it is little surprise that what exactly it is and does remains shrouded in secrecy and confusion. In the financial press, many have called shadow banks “non-deposit-taking financial institutions”, while others refer to them as “non-bank banks”. Such definitions are nonsensical and muddle the issue. A more honest and straightforward definition would be that shadow banks are private financial entities that create *ex-nihilo* credit-money without deposits. Such a generalization is problematic for many, however, as the following question would have to be: how do they create this money?

The declarations of Shwarcz (1994) are relevant in this regard. Arguing that “securitization is an alchemy that really works”, Shwarcz (*ibid.*, pp. 142–3) makes the case that off-balance-sheet accounting is necessary: as “securitization is usually viewed, for accounting purposes, as a sale of assets and not as financing, the originator does not record the transaction as a liability on its balance sheet. Such off balance sheet funding thus raises capital without increasing the originator’s leverage or debt-to-equity ratio on its financial statements [. . .] [T]his change of form is not to mislead investors”.

Shadow banking is simply a play on capital. A person or company can issue IOUs to the extent to which society will accept them. Under the “originate and distribute” banking model, shadow banks simply create structured products, often packaged and sold along with derivatives, in greater quantity than the capital backing them. Shadow banking creates piles of profits and mountains of debt: “for CDOs [collateralized debt obligations] that focused on the relatively senior tranches of mortgage-backed securities, annual manager fees tended to be in the range of \$600,000 to a million dollars per year for a \$1 billion dollar deal. For CDOs that focused on the more junior tranches, which were often smaller, fees would be \$750,000 to \$1.5 million per year for a \$500 million deal” (Financial Crisis Inquiry Commission, 2011, p. 131).

The total of outstanding structured financial products varies to a high degree between studies, which in general place it in the tens of trillions. The more known figure regarding unfunded assets of the shadow banking system is the roughly 650 trillion US dollar (notional) derivatives market.

Pozsar et al. (2010, p. 1) note that “examples of shadow banks include finance companies, asset backed commercial paper (ABCP) conduits, limited purpose finance companies, structured investment vehicles, credit hedge funds, money market mutual funds, securities lenders, and government-sponsored entities”. Much like the complexity of the flow of funds hides the stock or end results of the system, the abundance of actors and their multiple relationships within the system, while real, also obfuscates the fact that

the profits and the debt created by the shadow banking system, and the management of these, are all “dominated” by commercial and investment banks, in the words of Cetorelli and Peristiani (2012, p. 48).

Identifying investment banks as the principal actors in the production of debt and profits is a key first step in understanding the shadow banking system. Yet this is relatively simple compared to understanding the nature and magnitude of investment banks’ relationships with hedge funds, structured investment vehicles, CDOs and other entities that are connected to investment banks to highly varying degrees. With investment banks as the core actors, and off-balance-sheet special purpose vehicles as their satellites, the relationship between the two types of entities is far from uniform.

In many cases entities such as CDOs are relatively monolithic entities. Much like a mortgage-backed securities tranche, a bank would issue a CDO and then pretty much leave it alone. Yet as Cetorelli and Peristiani (2012) show, structured products have evolved towards an ever greater degree of management.

While shadow banking has been somewhat demystified, this market is still vastly more important to the economy than it is understood.

WESLEY C. MARSHALL

See also:

Asymmetric information; Bank money; Bubble; Endogenous money; Financial crisis; Financial supervision; Flow of funds; Glass–Steagall Act; Investment banking; Money and credit; Money creation; Narrow banking.

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Sovereign lending

Sovereign lending is lending to a foreign government. The key feature of the notion of sovereign lending is therefore to be found in the fact that the debtor is a State – the debt is public debt, not private debt – while the creditor is a foreign lender – the debt is external debt, not internal debt.

The term “sovereign lending” is generally used to refer to the case in which the debtor is a developing country, and the debt is not denominated in its domestic currency. Yet, in light of the strong growth in the share of public debt placed abroad in domestic currency

by both advanced and developing countries, it seems appropriate not to restrict the definition to emerging economies and to government debt denominated in foreign currencies. For example, sovereign lending is the issuance by Latin American sovereigns of foreign debt denominated in local currency. Sovereign lending is without any doubt also the loan that China gives to the United States by purchasing the securities issued by the US federal government. And the loan that France grants to Italy when buying Italian government bonds is certainly sovereign lending, although the lender and the borrower share the same currency.

The problems related to the notion of sovereign lending are linked not so much to the dichotomy between public and private debt – even though this dividing line may also give rise to some difficulties – but to the dichotomy between internal and external debt. Indeed, the definition of external debt is not unique, as there are three different definitions. The first is linked to the legal system that governs the debtor/creditor relations, and it regards as external the debt issued under the jurisdiction of a foreign court. The second definition focuses on the currency in which the debt is issued, and it regards as external the debt issued in a foreign currency. Finally, there is the definition used by the compilers of official statistics, which is based on the residence of the investor and considers as external every debt contract in which principal and interests are due to non-residents (see Cowan et al., 2006). Which definition is the most appropriate of course depends on the issue under discussion. When considering the degree of legal assistance that the lender is able to get in order to protect its rights in case of default, it is clear that the appropriate definition is the first. If we look at the matter from the point of view of exchange-rate risk, or of the borrower's ability to satisfy the lender with an asset that he can create at will, the appropriate definition is the second. When we look instead at the capability of the debt contract to ease the borrower's external constraint, the relevant definition is the third: a debt issued in the debtor's currency and governed by its legal system, when purchased by non-residents, usually gives rise to a foreign currency influx that can match current account deficits in the balance of payments.

The public debate about sovereign lending in this decade is dominated by issues related to the first definition given above. From that standpoint, a debt implies the existence of a legal entity able to subdue the debtor to the creditor in a framework of rules accepted by both (Buchheit and Gulati, 2010). For sovereigns this entity does not formally exist, and therefore economists have produced a vast number of works focused on the trivial attempt to explain why States pay their debts, even if there is not a court that forces them to do so (see Rogoff and Zettelmeyer, 2002).

Much more relevant is the second definition of external debt, as the currency in which the debt is defined brings attention to the trend towards global financial integration recorded over the past decades. During the 1980s and 1990s, emerging countries suffered the so-called “original sin”, only being able to borrow in the form of short-term foreign-currency-denominated external debt (see Eichengreen and Hausmann, 1999). This state of affairs has changed completely with foreign direct investment and portfolio equity now accounting for the majority of emerging countries' liabilities, and with their external debt increasingly denominated in their own currencies. Certainly, the transformation of some of the emerging countries in economies of great importance on a global scale is among the reasons why there has been an increase in their ability to borrow in their own currency. However, the emergence of the idea that the central bank should be

an institution independent of the political power and that the management of the currency must not be subordinated to the goal of internal development but to that of price and exchange-rate stability should not be underestimated. A second strand of research related to the issue of the currency in which the debt is denominated analyses the function of the central bank as debt-crisis-solver thanks to its action as lender of last resort, discussing the difficulty of developing an institution of comparable effectiveness at the international level (see Fischer, 1999).

This consideration brings us to the third and most important sense in which a debt, whether it is denominated in domestic or foreign currency, can be considered external; that is, a factor capable of relaxing the external constraint. From this point of view, the role played by the placing of public debt overseas is ambiguous. That these, as well as other, market-based capital inflows can expand the margins offered by the loans of the International Monetary Fund is a fact. However, it is also a fact that the movements of financial capital on a global scale are erratic, and the ability of a country to be the recipient of these inflows is subject – even more than in the case of loans from international organizations – to the adoption of policies aimed at the satisfaction of the creditor at the expense of economic growth-oriented policies. To the extent that this happens, in the longer term sovereign lending may operate as a factor of aggravation of the external constraint rather than as a means to overcome it.

ALDO BARBA

See also:

Central bank independence; Currency crisis; International Monetary Fund; Lender of last resort; Original sin.

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State money

The term “state money” refers to the chartalist approach to money defended by Knapp (1905 [1924]) and, in modern times, mainly by Wray (1998, 2002) and his colleagues at the University of Missouri–Kansas City. Conceptually, state money is defined as money “accepted by the state in discharge of liabilities to the state” (Wray, 1998, p. 11). It rests on a certain story regarding the origin of money and the functioning of the monetary circuit, and it has heavy normative implications, as it legitimizes a functional approach to public finance.

The orthodox approach to money, that is, *metallism*, highlights the medium-of-exchange

function of money. To this end, the genesis of the latter relies on a “barter tale”, which thinks of money as a commodity selected by traders, by virtue of its intrinsic properties (in this framework, the value of money is determined by the object used as a medium of exchange), to overcome the difficulties related to the “double coincidence of wants”. Originated as a cost-minimizing medium of exchange, money represents in this regard a natural phenomenon emerging spontaneously from the market. Hence, any hierarchical intervention is excluded from this story, except for an *ex-post* validation of the commodity-money.

At odds with this approach, neo-chartalism locates the origin of money in credit-and-debt relations: money is, at the same time, a unit of account measuring debts and a prerequisite for the existence of markets. Without any intrinsic value, money is akin to a social relation, which implies a promise because every payment extinguishes an existing debt. Relying on several research works in both numismatics and anthropology, neo-chartalists trace back the origin of credit and debt to the system of tribal *wergild* designed to prevent blood feuds: directly paid to victims, *wergild* fines represent a debt (measured in money units) intended to repair a personal injury. According to neo-chartalists, these fines were gradually converted into payments made to an authority: money represents a unit of account in which debts of the sovereign are measured.

By virtue of its power to impose a tax liability on its subjects, the state, according to Keynes (1930 [2011], pp. 4–5), has the prerogative to define money in two ways: (i) the state determines the unit, to wit, the money of account, in which its debts are measured; and (ii) the state chooses the medium in which taxes are due, that is, the means of payment. Regarding the latter, its tangible form is of minor interest, because the value of money does not come from its content but “depends on its usefulness in settling tax or other liabilities to the state” (Bell, 2001, p. 154). In this respect, the different stages of the monetary (or fiscal) circuit, relating to the efflux and reflux of money within the economic system, goes as follows. After having named the unit of account and imposed a tax liability in that unit, the state issues the money needed for its own expenses, thus starting the use of that means of payment within the economic system. Thanks to the money received for their sales to the state, firms and households are then able to pay taxes: money refluxes to its initial issuer, therefore closing the monetary circuit. In this framework, economic agents have to sell products to the state in order to receive the money needed for the payment of taxes: money is desirable, as it allows economic agents to free themselves from a (universal) tax debt. In other words, the value of money seems determined by what the population has to produce in order to obtain it from the government: the value of money is, through the payment of taxes, the mirror image of the value of goods, which have to be sold, directly or indirectly, to the state. (As Mehrling (2000, p. 398) points out, this relationship is a kind of “equation of exchange relating the flow of goods with the flow of money”.)

State money represents the unit in which tax debts are denominated and the medium in which these debts are due. For this reason, state money lies at the top of the hierarchy of money: that is, a debt pyramid classifying different promises (those of households, firms, banks, and the state) as a function of their degree of acceptability (see Bell, 2001, for elaboration on this), as it represents the unit in which all monies of this hierarchy are denominated (and the only unit in which taxes are due). If so, then the issuance of money

is a tool pertaining to fiscal policy. In a fractional reserve banking system, the state determines the supply of money: the state credits reserves to the banking system when it spends, while tax payments lead to a reserve drain. In this perspective, bank money is a leveraging of state money, the latter being considered as “outside money” injected into the economic system by public expenditure. Accordingly, since a balanced budget has no net impact on reserves, the liquidity preference of the private sector cannot be accommodated, unless the state runs a fiscal deficit. The sovereign nature of money therefore legitimates Lerner’s (1943) functional approach to public finance: since the state is able to buy products from the private sector by issuing its own debt, which is needed to pay taxes, it does not have to obtain the private sector’s money (through tax receipts or issuance of bonds) in order to finance its spending. The state is then in a position to run an “employer of last resort” programme (see Wray, 1998).

In this framework, the Treasury and the central bank are merged into one single entity called “state” (see Lavoie, 2013, for further elaboration on this). Now, the consolidation between the Treasury and the central bank is often used as a starting point for critics of the state-money approach. For instance, Gnos and Rochon (2002), as well as Rochon and Vernengo (2003), stress the fact that money is primarily a “creature of banks” and not a “creature of the state”: as a matter of fact, central bank money is essential for the working of national payments systems and the homogenization of different banks’ monies. In this respect, Rossi (2007, pp. 79–88) points out that state money, as the state’s own acknowledgment of debt, cannot finalize any payment, thus requiring the eventual intervention of the central bank.

JONATHAN MASSONNET

See also:

Bank money; Central bank as fiscal agent of the Treasury; Central bank money; Chartalism; Commodity money; Fiat money; Fractional reserve banking; Inside and outside money; Metallism; Modern Money Theory; Monetary circuit; Reflux mechanism.

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Sterilization

Central banks undertake sterilizations in order to reduce the supply of bank reserves (excess liquidity) on the interbank market. Such a surplus of liquidity is common in (developing) countries confronted with large capital inflows. Their central banks, concerned with excessive exchange-rate appreciation, accumulate foreign-exchange reserves for which they pay by creating base money. More recently, central banks in high-income countries deployed sterilizations to re-absorb the liquidity injected through unconventional monetary policy interventions. The European Central Bank, in particular, has sterilized its purchases of sovereign bond instruments since May 2010.

Sterilizations mostly occur through market-based strategies such as sales of government bonds or issue of central bank debt. Central banks are reluctant to use non-market interventions (capital controls or reserve requirements) either because they want to avoid the stigma associated with capital controls or because they believe market-based approaches provide a more effective management of money market liquidity (see Adler and Tovar, 2011).

Central banks rely on two theoretical rationales for sterilizations. The monetarist transmission mechanism requires central banks to exercise tight control over bank reserves in order to control broad monetary aggregates and inflation rates. Conversely, inflation-targeting central banks must ensure that the operational policy target (typically a short-term interbank interest rate) remains close to the policy rate of interest. Otherwise, excess liquidity pushes market interest rates below the level consistent with the desired path for aggregate demand. However, post-Keynesian scholars have long argued that banks do not behave as the passive actors imagined by the monetarist and New Consensus accounts of sterilization (see Lavoie, 2003).

Indeed, while sterilizations generate interest-rate costs for the central bank, the most problematic aspects of sterilizations concern the impact on resident bank activity and financial stability in general. Once the central bank undertakes active interventions on currency markets, it effectively abdicates its control over domestic liquidity conditions. Private banks ultimately decide whether the extra bank reserves are returned to the central bank (through sterilizations) or instead placed in higher-yielding assets such as equity, corporate bonds and asset-backed securities. Sterilized currency interventions can thus feed asset bubbles.

Christensen (2004) described “sterilization games” through which resident banks with access to cross-border funding become active intermediaries of capital inflows, exchanged for domestic liquidity on the currency market and then deposited in risk-free sterilization instruments. If the central bank accepts them as counterparties, foreign (non-resident) investors equally engage in sterilization games. Downside risks are limited because sterilization games appreciate the currency (Gabor, 2012). For example, Peru and South Korea used capital controls to curtail non-residents’ purchases of sterilization bonds once the global risk appetite was restored after 2010 (see Ostry et al., 2012).

Yet sterilization games are not the only instance of resident banks’ “improper intermediation” (see Calvo et al., 1993). It is well documented that currency interventions are rarely fully sterilized because of banks’ risk-trading appetites (Gabor, 2012). Rather than placing all excess liquidity in sterilization vehicles, resident banks use it to purchase high-yielding assets or lend it out to foreign investors searching for yield through carry-trade

strategies (Galati et al., 2007). Asset bubbles go hand in hand with growing cross-border short-term exposures and increased financial fragility. In his survey of sterilization strategies in Asian countries, Turner (2008) warned that such perverse effects are likely, unless central banks bypass resident banks altogether and instead issue long-term debt instruments to the non-bank sector. Alternatively, Lavoie (2003) suggests that central banks can adjust government deposits held with private banks to absorb extra liquidity.

The importance of sterilization is likely to increase since post-crisis macroeconomics is moving in the direction of a two-instrument–two-target approach in developing countries. Central banks manipulate interest rates to achieve price stability and undertake sterilized currency interventions to minimize the exchange-rate volatility associated with open capital accounts (Ostry et al., 2012). Given the perils of sterilization described above, central banks should instead consider carefully a range of capital controls that decouple exchange-rate management from asset bubbles and financial fragility.

DANIELA GABOR

See also:

Capital controls; Carry trade; Central bank bills; European Central Bank; Exchange-rate interventions; Financial bubble; Inflation targeting; Long-term refinancing operations; Monetary aggregates; Open-market operations; Outright Monetary Transactions; Policy rates of interest; Reserve requirements.

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Strong, Benjamin

Benjamin Strong was born on 22 December 1872 at Fishkill-in-the-Hudson, New York State, into a middle-class family. After short-lived studies in law and economics, he began in 1891 a career in banking and finance. In 1904, in part thanks to the prominent banker Harry Davison, he was appointed Secretary of the Banking Trust Company and eventually Vice-Chairman of the company in 1909; in 1914, he became Chairman. Strong was also a close friend of the famous American banker John Pierpont Morgan (see Chandler, 1958; Roberts, 2000).

In 1907, the United States was plagued by a dramatic crisis, which put the survival of its banking system in jeopardy. At that time, the country was still without a central bank, given the failure of two previous attempts: the First Bank of the United States (1791–1811) and Second Bank of the United States (1816–36).

Because of the high number of bankruptcies and bank panics (runs) generated by the 1907 crisis, in 1910 the US Congress created the National Monetary Commission, chaired by the Republican Senator Nelson Aldrich, whose mission was to think about banking reforms. Wishing to have an impact on the debate, and on future banking legislation, some prominent and powerful New York bankers decided to organize secret meetings in November 1910 at Jekyll Island (Georgia). Senator Aldrich also participated in these meetings, where Strong played a key role. In 1912 Aldrich finally drafted a bold reform agenda inspired by what was happening in Europe. The most ambitious part of this agenda was the creation of a genuine (but private) central bank, called the National Reserve Association.

The victory of the Democrat Candidate Thomas Wilson in 1912, however, generated a deep change in the agenda. The new administration retained only a very small part of Aldrich's project. In fact, it drafted a different system with less important institutional and prudential centralization and non-compulsory participation of local banks and trust companies.

Ultimately, the US Federal Reserve Act was promulgated on 23 December 1913. It created the US Federal Reserve System relying on 12 semi-autonomous Federal Reserve Banks, each one in charge of a district, and a (public) Federal Reserve Board, located in Washington, DC, whose role was to coordinate the Federal Reserve System.

Yet the reform was clearly incomplete and ambiguous: conflicts appeared between the Federal Reserve Board, endowed with weak power, and the mighty Federal Reserve Bank of New York, of which, on 5 October 1914, Benjamin Strong became Governor. It was only the Banking Act of 1935 that bestowed full ultimate power on the Federal Reserve Board in Washington, DC.

With considerable knowledge of the behaviour of the banking system, as well as being a clever negotiator, Strong built the Federal Reserve Bank of New York as the undoubted ruler of the Federal Reserve System: under his watch, the Federal Reserve Bank of New York became the *de facto* lender of last resort. In this sense, he strove to control money creation (credit) by "open market" operations. He was also a dedicated supporter of international cooperation in monetary policy, owing to frequent meetings between American and European central bankers. Most of the time, he was the key player of these meetings. As a result, he built strong links with many European colleagues, especially with Montagu Norman from the Bank of England, while he helped many countries plagued by financial troubles in the wake of the First World War (the United Kingdom, Belgium, France and Poland, among others).

Strong died on 16 October 1928 of tuberculosis, from which he had suffered since 1916. His death generated a deep lack of guidelines in the US Federal Reserve System. This explains why Milton Friedman and Anna Schwartz in their *Monetary History of the United States* claimed that, had Strong been alive in 1929, he could have prevented the crisis (see Friedman and Schwartz, 1963, pp. 412–13). Many great heterodox contemporaries of Strong's also had the highest respect for him. For instance, in his autobiography, American institutionalist John R. Commons (1964, pp. 192–3) wrote that he acquired a

deep understanding of the most difficult aspects of monetary policy thanks to Strong. Keynes, who knew him well also, had the greatest respect for him (see, for instance, the second volume of Keynes's *Treatise on Money* (1930 [1971])).

Indeed, in his obituary of Strong, Keynes (1972, p. 323) wrote that:

The premature death of Governor Strong [. . .] is a real misfortune. Governor Strong [. . .] had been by far the most important guiding influence in the evolution of the system ever since [its institution]. His integrity, independence, and real insight into the problems of his office have been of inestimable value, and there were very few, even in academic circles in the United States, who had thought more deeply [. . .] on the fundamental problems of the regulation of credit. The “open-market policy” [. . .], as a method of controlling credit developments, was in its present form largely his creation. We also lose in him a man of wide international sympathies, who was always ready to play a wise and generous part in alleviating monetary difficulties abroad [. . .]. His peculiarly intimate relations with the present Governor of the Bank of England ensured a measure of co-operation between the two institutions, without which our own money currency problems would have been more embarrassing.

SLIM THABET

See also:

Federal Reserve System; Financial crisis; First and Second Banks of the United States; Lender of last resort; *Monetary History of the United States, 1867–1960*; Quesnay, Pierre; Rist, Charles.

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Sudden stops

The expression “sudden stops” comes from a bankers’ adage quoted by Dornbusch et al. (1995, p. 219): “It is not speed that kills, it is the sudden stops”. In light of the 1994–95 Mexican crisis, the authors explained the interactions between exchange-rate devaluation and a deregulated financial environment in amplifying countries’ vulnerability to financial distress caused by an abrupt contraction of international capital flows. Since then, conventional views have continued to support the idea that large fiscal deficits and high debt-to-GDP ratios cause sudden stops, recommending, as a result, austerity measures (Cavallo and Frankel, 2004; Edwards, 2005).

However, the expression “sudden stops” was disseminated by Calvo (1998) to denote large negative swings in capital inflows affecting emerging markets in the 1990s. The empirical definition of sudden stops as unexpected and persistent drops in capital flows

by at least two standard deviations below the mean (Calvo, 1998; Calvo et al., 2008) led to several studies (Calvo, 2005; Calvo et al., 2006, 2008). The theoretical definition refers to a sudden stop as an external trigger of financial and currency crises that interact with domestic vulnerabilities, causing dramatic consequences in terms of output and employment (Calvo, 2013). More specifically, a shock in an emerging economy may affect another economy irrespective of its fiscal imbalances and of commercial links between the two countries. An example of such dynamics is how the 1998 Russian crisis affected Argentina. This is because a shock in one country hits the balance sheets of international financial intermediaries, prompting a liquidity crunch that results in “sudden, synchronized and widespread increase in interest rates for all emerging markets” (Calvo and Talvi, 2005, p. 9). Nevertheless, domestic dynamics largely contribute to the probability of sudden stops and to the severity of the resulting economic crisis: domestic factors explain the differences between the “significant slowdown” in Chile and “the excruciating collapse suffered by Argentina” (ibid., p. 1).

From a heterodox perspective, the above argument has at least two merits. First, empirically, it emphasizes the unstable nature of international capital markets and the liability dollarization of emerging markets (as one of the domestic vulnerabilities), exposing the flaws of the Washington Consensus that blamed emerging economies’ large fiscal deficits for the 1990s crises (Calvo and Talvi, 2005). Second, theoretically, it stems from a critique to the Hicksian interpretation of Keynes, responsible for the “utter disregard of the financial sector as a source of macroeconomic instability in mainstream economics” (Calvo, 2013, p. 11). Nevertheless, this argument crucially relies on an exogenous trigger, dismissing a central idea in post-Keynesian economics that capitalism is inherently unstable and that crises develop endogenously (Minsky, 1986; Kregel, 1998).

In fact, heterodox views tend to give more stress to the endogenous vulnerabilities associated with sudden stops, and to advocate, as a result of their analysis, a specific role for both domestic and international institutions, promoting capital controls and preferring foreign direct investments to other types of capital flows. For example, in a Kindleberger–Minsky model, Agosin and Huaita (2011, p. 680) show how “capital inflows [. . .] sow the seeds of sudden stops”, emphasizing that these may not be entirely externally triggered: a capital surge worsens the current account, leading to an appreciation of the currency, which then causes an increasing need of capital inflows. Moreover, David (2008) analyses the experience of price-based capital controls of Chile and Colombia during the 1990s. Others (Ocampo, 2005; Frenkel and Rapetti, 2009; Bresser-Pereira and Holland, 2009) propose institutional reforms for both domestic and international financial markets, and countercyclical policies that would smooth out adjustments in the event of sudden stops, in open contradiction to the austerity measures advocated by conventional views.

DANIELA TAVASCI AND LUIGI VENTIMIGLIA

See also:

Bank run; Capital controls; Capital flight; Currency crisis; Dollarization; Fear of floating; Financial crisis; Financial integration; International reserves.

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Sveriges Riksbank

The Swedish central bank (Sveriges Riksbank) is often said to be the world's oldest central bank. The bank was founded in 1668, when the Swedish parliament took over Stockholm Banco (a private bank). Sveriges Riksbank gained a more formalized role as a central bank in 1897, when it was granted exclusive rights to issue coins and notes in Sweden. In the late post-war period, the Riksbank was largely oriented towards exercising strict credit controls together with maintaining a fixed exchange-rate regime. Following a period of deregulation and substantial credit growth in the latter part of the 1980s, Sweden was struck by a severe financial crisis at the beginning of the 1990s. In November 1992, despite extraordinary margin rates of up to 500 per cent, the Riksbank was forced to abandon the fixed exchange-rate regime. Instead of maintaining a fixed exchange rate, an inflation target of 2 per cent became the objective of monetary policy.

The Sveriges Riksbank Act of 1999, which still applies, represented a major overhaul in terms of the Riksbank's objectives and governance. According to the Act, the Riksbank has a statutory objective to maintain price stability while at the same time it is to support the objectives of general economic policy with a view to achieving sustainable economic growth and high employment. To achieve this end, the Riksbank uses its repo rate of interest to target an inflation rate that has been specified as an annual change in the consumer price index (CPI) of 2 per cent.

The Riksbank also has a statutory objective to promote a safe and efficient payment

system. This includes providing an electronic payment system (RIX), which handles large-value payments between banks and other actors in Sweden. It also means promoting stability in the Swedish financial system as a whole. To this end, the Riksbank may in certain circumstances provide temporary liquidity assistance to banks. A substantial part of the work on financial stability is devoted to analysing the stability of the financial system on a continuous basis in order to detect, at an early stage, changes and vulnerabilities that could lead to disruptions. Also, contributing to the development of sound financial regulation both domestically and internationally is another important task relating to financial stability. The Riksbank also has considerable asset management operations, as a means to achieving its statutory objectives, including being able to provide temporary liquidity assistance to banks in both Swedish kronor and foreign currencies, and influencing the exchange rate for the Krona for monetary policy purposes. Furthermore, the Riksbank provides loans to the International Monetary Fund, to use for lending to countries experiencing a financial crisis.

The Sveriges Riksbank Act of 1999 also reformed the governance of the Riksbank. Among other things, it provides the Riksbank with more political independence than before, making it an authority under the Swedish parliament (Riksdag), and isolating its monetary policy decisions from political instruction. The Riksdag appoints the Riksbank's General Council, which in turn appoints and monitors the Executive Board of the central bank. The Executive Board consists of six members, each appointed for a period of five or six years. One Executive Board member is appointed Governor of the Riksbank and the Chairman of the Executive Board. The decisions of the Executive Board are based on majority, and the Governor has the casting vote. Stefan Ingves is currently the Governor of the Riksbank, among his various other appointments, including Chairman of the Basel Committee of Banking Supervision.

The Sveriges Riksbank is also renowned for its Prize in economic sciences; often called the Nobel Prize in Economics. The prize was established in 1968, commemorating the Riksbank's 300th anniversary. The prize winners are chosen by the Royal Swedish Academy of Sciences according to the same principles as for Nobel Prizes.

ELIAS BENGTTSSON

See also:

Bank of England; Central bank independence; Consumer price indices; Financial crisis; Inflation targeting; Repurchase agreement; Settlement system.

Swap

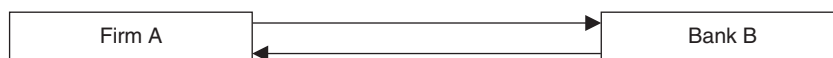
A “swap” is a financial derivative in which two parties agree to exchange a pre-determined stream of two-way cash flows. These cash flows typically consist of a regular exchange of a fixed interest rate, negotiated between the parties, against a variable interest rate, both calculated on a notional amount (sometimes called the principal). This interest-rate swap (IRS), introduced in the 1980s, allows the parties to switch from a variable interest-rate exposure to a fixed interest-rate exposure, and thus provides a hedge to a party unwilling to bear an interest-rate risk (see example below). Similarly, swaps can be used to hedge

EXAMPLE: A PLAIN-VANILLA INTEREST-RATE SWAP (IRS)

Party A (for instance a firm) does not want to bear an interest-rate risk on a stream of payments it will receive in the future from a client C at a variable rate of 12-month EURIBOR + 3% on a notional amount of 100 million euros. Party A may conclude a swap contract with party B (for instance a bank), in which A will pay the variable rate of interest to B and will receive a fixed interest rate from B.

Variable leg

Firm A pays 12-month EURIBOR + 3% per annum to bank B on a notional amount of 100 million euros

**Fixed leg**

Bank B pays 4% per annum to firm A on a notional amount of 100 million euros

Firm A will receive for sure 4% per annum on the notional amount, and will pay 12-month EURIBOR + 3% (equal to what it will receive from C). Firm A has successfully offset its interest-rate risk (it now knows for sure the interest it will have to pay in the future).

a wide range of other risks, such as exchange-rate risk (currency swaps) or default risk (credit default swaps, CDS). Hull (2009) provides a detailed presentation of the different swap markets.

Contrary to options or futures, swaps are traded in the over-the-counter (OTC) market. Hence they are not standardized contracts. According to the Bank for International Settlements (2014), the notional outstanding amount on the IRS market accounted for 563 trillion US dollars in June 2014, compared to 29 trillion US dollars in 1998. IRS are the most exchanged, while currency swaps represented only 75 trillion US dollars in June 2014, compared to 1.9 trillion US dollars in 1998.

From a monetary policy point of view, swap instruments convey highly valuable information to measure market stress. The BOR/OIS spread is probably one of the most common measures of the interbank market risk. The BOR is the unsecured interbank rate of interest (such as the LIBOR or EURIBOR), while OIS stands for the overnight indexed swap (an IRS where the variable rate of interest is the overnight unsecured interbank rate of interest, like the EONIA interest rate in Europe), both having the same maturity. As the OIS rate of interest captures the expected evolution of the short-term rate of interest and thus the expectations about the future path of monetary policy, the BOR/OIS spread mainly measures the counterparty risk between banks on the interbank market.

Central banks call “swap lines”, by reference to currency swaps, their bilateral or multi-lateral agreements to provide to each other a foreign currency liquidity backstop. Hence, a swap line between central bank A and central bank B allows the former to provide liquidity in the B currency to its own banking sector. This ability in times of crises may be crucial when the banking sector of country A has a large part of its liabilities

denominated in country B's currency, and faces funding difficulties due to a liquidity stress in B's interbank market.

A widely used metric of cross-currency liquidity stress is the “cross-currency basis swap”, discussed for instance by Baba et al. (2008). It compares a direct funding in country B's interbank market with a synthetic funding in currency B via a funding in country A's interbank market and a currency swap to switch from currency A to currency B. The basis swap should remain close to zero in normal times (in case of perfect arbitrage, the two funding possibilities should have the same pricing, owing to covered interest-rate parity); its deviation is associated with cross-currency liquidity shortage conditions.

Swap lines have been heavily used by central banks in emergency times and have proved to be powerful means of containing liquidity stress in a timely manner and of limiting the consequences of the malfunctioning of interbank markets (see for instance Rose and Spiegel, 2012). They benefit indeed from their flexible, short-notice design, and seem to outline an informal coordination of lenders of last resort, besides the more traditional and also more stringent liquidity facilities provided by the International Monetary Fund. On the other hand, swap lines remain *ad hoc* agreements between central banks, with sometimes little transparency about the rules and criteria of both the decision to sign an agreement and the exact conditions of the use of these lines.

As operations of lenders of last resort, swaps are conducted against proper guarantees with solvent institutions and normally at a penalty rate of interest. However, there was some evidence during the global financial crisis that burst in 2008 that a stigma effect also discouraged some commercial banks from requesting access to the swap line facilities, as they feared that a bid to these operations, if known, would have signalled that they have lost access to the market (this issue is discussed for instance by Moessner and Allen, 2013).

In the depths of the global financial crisis in late 2008, the US Federal Reserve reported that foreign central banks used their swap lines up to around 600 billion US dollars. The Federal Reserve, the European Central Bank, the Bank of Japan, the Bank of England, the Bank of Canada and the Swiss National Bank signed a multilateral swap agreement, intended to be effective until only February 2014 but which was replaced by a permanent scheme in October 2013.

BENOÎT NGUYEN

See also:

Financial crisis; International Monetary Fund; Lender of last resort; LIBOR.

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Swiss National Bank

The Swiss National Bank (SNB) is the central bank in Switzerland. It was established by the 1905 National Bank Act and began its operations on 20 June 1907 (see Bordo and James, 2007, for a detailed historical account). Article 99, paragraph 2, of the Federal Constitution of the Swiss Confederation entrusts the SNB with the conduct of “a monetary policy that serves the overall interests of the country” (Federal Authorities of the Swiss Confederation, 1999). The SNB’s mandate is précised in the National Bank Act, which was fully revised in the early 2000s and entered into force on 1 May 2004: “The National Bank shall pursue a monetary policy serving the interests of the country as a whole. It shall ensure price stability. In so doing, it shall take due account of the development of the economy” (Federal Authorities of the Swiss Confederation, 2003, art. 5, para. 1).

In 1974, the SNB was the second central bank in the world, after the Bundesbank, to adopt a monetary targeting strategy after the demise of the fixed exchange-rate regime. The SNB, however, “took a pragmatic approach to adapting its policy to changing circumstances” (Peytrignet, 2007, p. 238). In practice, the SNB did not follow the strict monetarist precept encapsulated in the Friedman rule – according to which the relevant monetary aggregate has to be increased in line with the rate of real GDP growth (Friedman, 1968) – but implemented monetary targeting in a flexible way, also because, Switzerland being a small open economy with a large financial market, a number of shocks have a foreign origin and require a flexible approach to monetary policy (Baltensperger et al., 2007, p. 4). A rigid monetary targeting, coupled with an appreciation of the Swiss franc real exchange rate, would have rendered the SNB monetary policy unnecessarily restrictive, giving rise to prospects of a massive slump in output and employment levels (Rich, 2000, p. 450).

At the end of the twentieth century, the SNB modified its monetary policy strategy in order to improve its long-run contribution to price-level stability and macroeconomic stabilization in Switzerland. “While the new framework introduced important new elements, it did not represent a complete break with the past, as the basic objective of [Swiss] monetary policy remained entirely unchanged” (Baltensperger et al., 2007, p. 4). In particular, since 2000 the SNB has been putting inflation forecasts at the centre of its internal monetary policy analysis and external policy communication (Rich, 2000, p. 452; Jordan and Peytrignet, 2001, p. 55), although this does not make the SNB an inflation-forecast targeting monetary authority in the form argued by Svensson (1997) and Svensson and Woodford (2004): the SNB has no obligation to keep the measured inflation rate in any economic circumstances and at any costs in line with its inflation forecast. Also, the time horizon to bring the actual inflation rate back in line with the SNB inflation forecast, after any deviations from it, is not predetermined. Indeed, “[t]he SNB analyses each situation individually and decides depending on the current economic conditions” (Jordan and Kugler, 2004, p. 382).

This flexible monetary policy framework allowed the SNB to introduce an exchange-rate floor on 6 September 2011, when, in the aftermath of the euro-area crisis and the ensuing pressures on the Swiss franc exchange rates, it announced that “[w]ith immediate effect, it will no longer tolerate a EUR/CHF exchange rate below one Swiss franc twenty. The SNB will enforce this minimum rate with the utmost determination. It is prepared to

purchase foreign exchange in unlimited quantities” (Hildebrand, 2011, p. 1). As the SNB recognized (*ibid.*), the macroeconomic costs associated with this exchange-rate policy might be very high, notably as regards the real-estate market and the related bubble that this policy could inflate, thereby contributing to financial instability across the Swiss banking sector. These risks have induced the SNB, together with the Swiss Federal Council and the Swiss Financial Market Supervisory Authority, to design an array of macro-prudential tools, whose effects are still unknown at the time of writing (July 2014).

SERGIO ROSSI

See also:

Euro-area crisis; Friedman rule; Housing bubble; Inflation targeting; Macro-prudential tools; Monetarism; Monetary targeting.

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Systemically important financial institutions

The Financial Stability Board (2011, p. 1) defines systemically important financial institutions (SIFIs) as “financial institutions whose distress or disorderly failure, because of their size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity”. In order to prevent this outcome, governments often find themselves forced to bail out such institutions using public funds. Because SIFIs can anticipate this scenario, they enjoy an implicit – if not

explicit – government guarantee and therefore an indirect subsidy, as it is cheaper for them to borrow on financial markets (Ueda and Weder di Mauro, 2013). The moral hazard effect encourages overly risk-taking behaviour that may appear rational from the individual institution's perspective, but is sub-optimal at a system-wide level. The term "SIFI" was introduced with the Dodd–Frank Wall Street Reform and Consumer Protection Act, a bill signed into law during summer 2010 that was designed to end "too big to fail" (TBTF) in the United States. Economists have criticized the shift in terminology from "TBTF" to "SIFI", because "criteria such as interconnectedness, complexity, correlation and conditions/context are either irrelevant or follow from size" (Moosa, 2010, p. 121).

In order to address the adverse effects SIFIs have on the economy, the Basel Committee on Banking Supervision (BCBS), the International Association of Insurance Supervisors (IAIS) and the Financial Stability Board (FSB) issued a series of documents in which SIFIs are clustered into global systemically important banks (G-SIBs), domestic systemically important banks (D-SIBs), and global systemically important insurers (G-SIIs). G-SIBs are identified by the FSB according to a methodology developed by the BCBS. An indicator-based measurement approach is used to determine which banks are G-SIBs (Basel Committee on Banking Supervision, 2011, p. 5). The five indicators equally reflect: (i) size; (ii) interconnectedness; (iii) lack of readily available substitutes or financial institution architecture for the services they provide; (iv) cross-jurisdictional activity; and (v) complexity. D-SIBs are banks that are not deemed systemically important from a global perspective but may cause serious distress to national financial systems (Basel Committee on Banking Supervision, 2012, p. 1). The principle-based approach developed by the BCBS focuses on higher loss-absorbency requirements for D-SIBs and allows for national discretion. G-SIIs are identified by the FSB in consultation with the IAIS and national authorities according to a methodology developed by the IAIS. The indicator-based measurement approach is similar to the G-SIB framework elaborated by the BCBS, but deviates where insurers vary from the banking sector's structure and activity (International Association of Insurance Supervisors, 2013a, p. 10). The selected indicators reflect: (i) size; (ii) global activity; (iii) interconnectedness; (iv) non-traditional and non-insurance activities; and (v) substitutability (*ibid.*, p. 12). Categories (iii) and (iv) receive a weight of 40 per cent and 45 per cent respectively. The weighting of each of the other three categories is 5 per cent.

The G-SIBs identified by the FSB are subject to voluntary and internationally harmonized requirements for additional loss absorbency. This additional requirement is to be met with common equity tier 1 capital, the highest quality component of a bank's capital, analogous to the Basel III framework. The overall aim of this policy is to reduce both probability and impact of failure of G-SIBs (Basel Committee on Banking Supervision, 2011, p. 2). The IAIS framework of policy measures for G-SIIs includes four components: (i) enhanced supervision; (ii) increased resolvability; (iii) loss absorbency capacity; and (iv) higher loss absorption capacity (International Association of Insurance Supervisors, 2013b).

According to many economists, TBTF cannot be solved merely with minimum capital requirements and better oversight (Stiglitz, 2009; Johnson and Kwak, 2010; Roubini and Mihm, 2010). Instead, large financial institutions should be broken up into smaller entities. Additionally, high-risk activities typical for investment banking should be separated

from banks' core function of providing payment services and financial intermediation. What distinguishes banks from other institutions is their ability to expand their balance sheets by granting loans – thereby simultaneously creating deposits – independent of the income available in the economy. If no corresponding output comes into being, this extra money increases the credit-to-GDP ratio, thereby destabilizing the economy (Gourinchas and Obstfeld, 2012). Panzera and Rossi (2011) therefore suggest a structural reform of banks' bookkeeping that would allow a separation of income-generating from income-transferring operations. To date, financial institutions' large and unscathed political leverage has prevented such effective reforms. Indeed, since 2008, financial institutions have grown even larger and would most likely still be bailed out in case of impending bankruptcy (*Financial Times*, 2013).

OLIVER SIMON BAER

See also:

Basel Agreements; Capital requirements; Endogenous money; Financial crisis; Financial instability; Narrow banking.

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T

TARGET2 system

The TARGET2 system is the payment system for cross-border transactions within the euro area. TARGET is the acronym for “Trans-European Automated Real-time Gross-settlement Express Transfer”. This system has been set up to enable payments across the euro area to be carried out as soon as the European single currency was introduced in purely book-entry form in January 1999. Owing to time constraints, and probably also to an essential lack of understanding of the nature of money and payments (see Rossi, 2007), the infrastructure for the TARGET system (which was technically improved in November 2007 and therefore rebaptized TARGET2) relies on national payment and settlement systems, linked together without attributing the role of international settlement institution to the European Central Bank (ECB). As a matter of fact, “[c]ross-border TARGET payments are processed via the national RTGS [standing for Real Time Gross Settlement] systems and exchanged directly on a bilateral basis between NCBs [national central banks]” (European Central Bank, 2007, p. 34). Indeed, “[o]nce the sending NCB has checked the validity of a payment message and the availability of funds or sufficient overdraft facilities, the amount of the payment is debited irrevocably and without delay from the RTGS account of the sending credit institution and credited to the Interlinking account of the receiving NCB” (ibid., p. 35). The “Interlinking account” is an account that each NCB holds within the Interlinking mechanism, which consists of “the infrastructures and procedures which link domestic RTGS systems in order to enable the processing of inter-Member State payments within TARGET” (European Central Bank, 2011, p. 58). After all security checks and message verifications have been carried out correctly by the receiving NCB, the latter “converts, where appropriate, the message from the Interlinking standard into the domestic standard, debits the Interlinking account of the sending NCB, credits the beneficiary’s RTGS account and delivers a positive acknowledgement to the sending NCB” (European Central Bank, 2007, p. 35).

The TARGET2 system is structurally different from the interbank payment system in the United States. In the latter country, interbank payments are carried out through the Federal Reserve Wide Network (called Fedwire), and the country consists of 12 Federal Reserve Districts, between which all payments are recorded within the Interdistrict Settlement Account (ISA). “The daily settlement between Districts is conducted by the centralized Integrated Accounting System (IAS), which captures the data needed to conduct settlement. Once settlement has been effected, IAS posts the appropriate entries directly to each Reserve Bank’s accounts” (Board of Governors of the Federal Reserve System, 2012, p. 1–51). As Sinn and Wollmershäuser (2012, p. 496) note in this regard, in the United States “[p]ayments between commercial banks of different districts are done via the Fedwire System and are settled via the accounts of the commercial banks at the corresponding District Fed. The payments are booked in the ISA, which is a real-time gross settlement system” like TARGET2. In spite of this similarity, Fedwire and TARGET2 differ on an essential characteristic: the US payment system implies that each District Fed must settle once per year its annual average increases in the ISA balances

by transferring some eligible assets to its creditors, whilst NCBs that participate in the TARGET2 system have no such obligation. Their debtor balances can therefore go on increasing indefinitely, increasing the amount of claims on them in the hands of creditor NCBs that participate to the TARGET2 system. This essential difference between the US and the euro-area-wide payment system arises because the ECB does not yet operate as a settlement institution for NCBs within the TARGET2 system – a role that is merely technical and originates in the nature of payments, which imply three parties without any exceptions.

To be sure, as Hicks (1967, p. 11) noted, “[e]very transaction involves three parties, buyer, seller, and banker.” The banker is merely a go-between, because s/he does not buy or sell anything when s/he carries out the payment ordered by the payer in favour of the payee. In a similar vein, this principle remains valid on the interbank market, where both the payer and the payee are banks: any payment on this market logically requires central bank money to be final for both banks involved. As Goodhart (1989, p. 26) explains, payment finality obtains when the “seller of a good or service, or another asset, receives something of equal value from the purchaser, which leaves the seller with no further claim on the buyer.” Since money is an acknowledgment of debt, “banks do not accept bank money in interbank transactions, but ultimately require their claims to be settled in central bank money” (Deutsche Bundesbank, 1994, p. 46), because otherwise their debt–credit relationships are not paid finally. This principle is also valid when payments concern NCBs: the finality of these payments requires that an international settlement institution issues the means of final payment between the sending central bank and the receiving central bank. To date, in the euro area this principle has been put into practice for banks as well as for non-bank agents, but not (yet) for national central banks.

SERGIO ROSSI

See also:

Central bank money; Clearing system; Euro-area crisis; European Central Bank; European monetary union; Federal Reserve System; International settlement institution; Settlement system.

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Taylor rule

The Taylor rule is a monetary policy rule requiring central banks to set interest rates following a specific formula in order to keep inflation on target. Following Friedman (1960), most mainstream economists reject policy discretion and instead argue for policy rules. As Taylor (1993, p. 197) puts it, “[i]f there is anything about which modern macroeconomics is clear however – and on which there is substantial consensus – it is that policy rules have major advantages over discretion in improving economic performance”.

Friedman’s (1960) original suggestion was a rule requiring a constant pre-determined growth-rate of the money stock. However, this required the money stock to be under the control of the central bank, a proposition that post-Keynesian economists in particular rejected. They argued that it was, in fact, endogenously determined, mainly by demand from the private sector, and that the appropriate instrument for monetary policy was the interest rate. Eventually mainstream economists came to accept this position, though they argued that it was due to instability in the demand for money, rather than to the impossibility of the central bank controlling the money supply (Palley, 2006). As a result, “the interest rate rather than the money supply is the key instrument that should be adjusted” (Taylor, 1999, p. 47).

Under a Taylor rule, the central bank adjusts the policy rate of interest to control for inflation, responding to any deviation in the rate of inflation from its target level. In addition, since aggregate demand shocks (or expected shocks) are seen as the major cause of inflation, this is also incorporated into the Taylor rule via deviations of real GDP from potential GDP, which are indicators of inflationary pressure. As such, this requires “continuous adjustments in the policy instrument aimed at keeping the system in equilibrium through deliberate management” (Bibow, 2006, p. 343) and, as a result, blurs the distinction between “non-reactive” rules and fine-tuning.

There are many variants of the Taylor rule, but its best-known form can be written as follows:

$$i = \pi + \alpha (\pi - \pi^T) + \beta (y - y_n) + r_n$$

where i is the nominal interest rate, π the actual inflation rate, π^T the target inflation rate, y the level of real GDP, y_n the level of potential or full capacity real GDP, while r_n “is the implicit real interest rate in the central bank’s reaction function” (Taylor, 1999, p. 50), which is, in Wicksellian terms, the central bank’s estimate of the “natural” (real) rate of interest.

There are a number of variants of the Taylor rule equation, with, for example, GDP being replaced by the level of capacity utilization. The rule can be expressed in real terms by noting that the real interest rate $r = i - \pi$, so that the equation for the Taylor rule becomes:

$$r - r_n = \alpha_1 (\pi - \pi^T) + \beta_1 (y - y_n)$$

In the long run, as defined by neoclassical authors, $\pi = \pi^T$ and $y = y_n$, so that $r = r_n$.

The central-bank reaction function does not guarantee that the target inflation rate will ever be achieved. This is recognized by Taylor (1999, p. 51), who maintains that if the

central bank acts on an incorrect estimate of the natural rate of interest, “then the steady state inflation rate will not equal the target inflation rate”. Also, the level of output can converge to its potential level without the steady state inflation rate converging to the target rate set by the central bank. For instance, if the implicit real interest-rate estimate is too high, the actual steady state rate of inflation will be too low relative to the target, and hence the central bank will need to revise downwards its estimate of the “natural” rate of interest (Lavoie, 2004).

Although Taylor rules focus on interest rates as the appropriate policy instrument, this is their only link to post-Keynesian theory, as the underlying analysis relies on neoclassical assumptions about how the economic system works. Foremost is the belief that monetary policy can only influence levels of employment and real output in the short run. In the long run unemployment levels will return to their “natural” rates, and money is neutral. Short-run deviations from this are possible owing to imperfections in the economy in the form of sticky prices and wages, and imperfect information. As a result, post-Keynesians raise a number of important criticisms of Taylor rules and of their underlying theoretical framework.

A key criticism focuses on the idea of inflation as the main target of macroeconomic policy. There is little evidence that inflation causes major problems to the economy, unless it is at very high levels (see Barro, 1996; Kriesler and Nevile, 2014). For post-Keynesians, the unemployment rate is a much more appropriate target for policy. In fact, mainstream economists are not worried about unemployment as, in the long run, the economy will return to the natural rate of unemployment, or to the Non-Accelerating Inflation Rate of Unemployment (NAIRU). This is tied to the vertical long-run Phillips curve, with the associated assumption that the level of aggregate demand plays no role in the determination of employment or output in the long run.

Related to this is the long-run neutrality of money: monetary variables and monetary policy have no influence on real variables in the long run. For post-Keynesian economists, there is no long-run position to which the economy is attracted, much less a long-run (“natural”) level of employment and output. Rather, these are determined by the path of aggregate demand, and there is no mechanism in capitalist economies that automatically guarantees full employment in either the short or long run. As monetary variables and monetary policy have an important role in the determination of aggregate demand in both the short run and the long run, money is not neutral (Kriesler and Lavoie, 2007).

Since monetary policy acts upon inflationary forces by weakening aggregate demand and labour conditions, Taylor rules operate via demand-side factors. To the extent that inflation is caused by supply shocks or cost factors, then monetary policy aimed at demand-side causes will be ineffective (Rochon, 2009, p. 54).

Advocates of Taylor rules consider that monetary policy should be the main economic policy, with fiscal policy demoted to a secondary role (Rochon, 2009). This view is in sharp contrast with that of post-Keynesians, who argue that fiscal policy needs to be the main instrument for achieving economic stability. They argue (as do many monetarists) that monetary policy is a blunt instrument with long and variable lags. Most of the components of aggregate demand respond slowly, if at all, to changes in interest rates, unless interest rates are changed drastically (which may jeopardize the stability of the financial system). In addition, several post-Keynesians believe that, before high rates take their

toll, real interest-rate hikes lead to higher inflation rates, through interest cost push (see Kaldor, 1982, p. 63).

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See also:

Central bank credibility; Endogenous money; Friedman rule; Inflation targeting; Interest rates setting; Monetary targeting; Money neutrality; Money supply; Natural rate of interest; Policy rates of interest; Rules versus discretion.

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Thornton, Henry

Henry Thornton's (1760–1815) masterwork (*An Enquiry into the Nature and Effects of the Paper Credit of Great Britain*), published in 1802, stands at the starting point of the line of thought according to which the regulatory basis of a developed financial system is not gold, but central bank's discretion. For his placing great emphasis on the Bank of England as a regulator and guarantor of the liquidity of the British financial system, Thornton is considered the "father of the modern central bank" (Hetzel, 1987, p. 3). This expression is undoubtedly correct if "modern" stands for "mainstream". Indeed, the rediscovery of Thornton in the twentieth century (see Hicks, 1967, among others) should not obscure the fact that, together with Ricardo, he is the great theorist of the neutrality of money. Yet, while Ricardo stuck to neutrality, hammering with it central bankers' discretion, Thornton was much more flexible, thus propping up the role of the central bank. In Thornton's work, for the first time, short-run non-neutrality and long-run neutrality of money are considered as equally important. This problematic coexistence, then as now, sets the boundaries of the theory and practice of money management.

The Bank of England's decision in 1797 to suspend redemption of its notes in gold

showed how the monetary debate of the previous decades had lagged behind the developments of the British financial system. The discussion had run aground with Adam Smith's idea that paper did nothing else than replace gold, and some automatic mechanism would ensure the reflux of overissued means of circulation to their point of departure. Thornton rejected the idea of a constant relationship between the whole circulating medium and the volume of transactions. Having widely extended the definition of money (bills of exchange, notes, and so on), he noted that there are different velocities of circulation for different types of money (bills circulate less rapidly than notes), and for the same class of paper money at different times (the preference for central bank notes can vary). Paper credit was endogenously created according to the needs of trade, but it was not self-regulating and the smooth functioning of these means of circulation largely depended on confidence. Then there was the problem of controlling money creation, and of varying the supply of central bank notes in order to buffer the destabilizing effect of any sudden change in their demand.

The theoretical foundation of this position is a very sophisticated version of the quantity theory of money, which is able to take into account that outside money was only a small part of the overall means of circulation. Thornton realized that the interest rate is the connecting link between the money supply and the price level: "[w]e may [. . .] consider this question as turning principally on a comparison of the rate of interest taken at the bank with the current rate of mercantile profit" (Thornton, 1802 [1962], p. 254). An interest rate lower than the rate of profit would start a process of excessive endogenous money creation, thereby fuelling an increase in prices, which would in turn propel further creation of endogenous money. This point was clearly stated in *Paper Credit* (ibid.), and indeed Thornton strictly opposed usury laws, which for over a century had set an upper limit of 5 per cent to the rate of interest, thereby preventing the money rate of interest from keeping pace with the profit rate. With a ceiling to the market rate of interest, the resulting price increases would have required a quantitative restriction on money, up to the point of resorting to gold convertibility.

The fact that Thornton – ten years after *Paper Credit* and its strong support for the suspension of bullion payments – became one of the champions of the return to gold (he was one of the drafters of the *Bullion Report*) should not be surprising in light of the positive correlation he always upheld between the money stock and the price level, and his strict adherence to the long-run neutrality of money. Thornton was a bullionist, albeit a moderate one, and his moderation depended on two beliefs he never abandoned: (i) monetary contractions can have destabilizing consequences on industry; (ii) the credit system is based on confidence, and when confidence is shaken, the central bank must restore it, not by implementing any restrictions, but on the contrary by lending without limitations. This led Thornton to reject the idea that the high price of bullion was always indicative of an overissue that should be countered by a credit squeeze. He considered it imperative to distinguish an internal from an external drain; and also in the case of an external drain, that a credit restriction was needed only in order to face permanent misalignments of internal and external prices, not to face temporary mismatches (as in the case of a bad harvest).

With respect to the exact nature of the destabilizing consequences of price changes on industry, Thornton's contribution has been regarded – especially after Hicks (1967) – as an anticipation of Keynes. This is too favourable to Thornton, or perhaps too

unfavourable to Keynes. Thornton described deflation and inflation as basically distributive phenomena owing to rigid nominal wages. In particular, he was very worried about the possibility that, in an attempt to deflate prices through a credit squeeze, the manufacturer could find himself deprived of credit at the very moment when income distribution evolves against profits, thus making him “absolutely compelled by necessity to slacken, if not suspend, his operations” (Thornton, 1802 [1962], p. 118). In Thornton’s view, changes in the velocity of money circulation are due to changes in confidence. Hence, according to Hicks (1967, p. 179), “he has not one but two of the key-points of the Keynesian system; he has the Liquidity Preference and he has the stickiness of wages”, although – owing to his adherence to the doctrine of full employment – he is deficient on the multiplier. But liquidity preference is important for Keynes not so much because it offers a constructive theory of the interest rate, but because it allows him to challenge the orthodox theory, to wit, the idea that the rate of interest may act as an equalizer of demand and supply of savings (Garegnani, 1979, pp. 67–73). Thornton’s short-run non-neutrality of money concerns instead precisely the temporary real disturbances that price changes generate during the process that in the longer run brings the market interest rate towards convergence with the natural rate of interest.

ALDO BARBA

See also:

Banking and Currency Schools; Bank of England; Bullionist debates; Central bank money; Endogenous money; Inside and outside money; Money creation; Money neutrality; Natural rate of interest; Quantity theory of money; Real-bills doctrine; Reflux mechanism.

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Time inconsistency

An important issue in the mainstream literature on economic policy is whether monetary authorities can get some “additional output” by means of a demand stimulus. The answer depends on the shape of the Phillips curve. In the long run, both New Keynesian and New Classical economics agree that the Phillips curve is vertical, so that one cannot reduce the rate of unemployment below its “natural rate”. In the short run, however, a demand stimulus may have a positive impact on economic activity depending on whether the resulting inflationary effects are fully transmitted (vertical Phillips curve) or not (negatively-sloped Phillips curve) to nominal wages and other factor costs.

New Keynesian economics points out that, owing to nominal rigidities, the “surprise inflation” that goes along with unexpected demand stimulus takes time before it is

transmitted to wages, so that real wages decrease temporarily. Firms therefore have an incentive to increase the demand for labour and the supply of goods, albeit a temporary one.

New Classical economics, on the other hand, emphasizes that owing to rational expectations, this kind of stimulus can work only if it is not implemented in a systematic way; that is, as a policy rule. If this stimulus is repeated systematically, it becomes predictable, so that nominal wages increase in anticipation of the expected inflation. As in this case wages (and other real factor costs) do not decrease in line with the demand stimulus, the stimulus fails eventually, despite nominal rigidities.

Rational expectations therefore make “active policy rules” ineffective insofar as these kinds of rules involve some systematic, predictable policy. Hence in a stationary regime where rational expectations capture any “systematic policy bias”, “surprise inflation” can only reduce the rate of unemployment below its natural level if it results from a discretionary policy, as opposed to an active rule.

Time inconsistency became popular when Kydland and Prescott (1977) pointed out that the central banks’ power of implementing a discretionary demand stimulus should be abandoned. According to the authors, discretion entails a credibility issue, as there is an incentive for monetary authorities to implement a higher inflation rate than the announced inflation target. In order to explain this, suppose first that the central bank’s announcement is credible, which supposes that the private sector believes that this announcement is going to be respected and that the private sector’s expectations, therefore, are going to be fulfilled. As the announced inflation target is aimed at anchoring the private sector’s expectations, the lower the announced target rate of inflation, the lower the anticipated nominal wage increase. The optimal inflation rate announcement in this case is zero.

Now, while the optimal announcement is zero, there is an incentive to take advantage of the private sector’s confidence by proceeding to a “surprise inflation”, since a stimulus is capable of reducing the real wage and thus stimulating the economy beyond the “natural” position as long as the private sector’s expectations remain anchored to the announced target rate of inflation. The central bank’s discretionary power makes such a time-inconsistent monetary policy possible. Time inconsistency arises when, owing to discretionary power, the optimal target rate of inflation is not the same before and after the private sector has formed expectations.

Monetary policies that suffer from time inconsistency are not credible *a priori*, with the result that the private sector can rationally predict the inflation rate the central bank is really implementing, not the one it announces. At the end of the day, real wages do not decrease and no “additional output” is produced. The only outcome is a higher rate of inflation, which is the punishment for time-inconsistent discretionary policies carried out by the central bank.

To avoid such an inflationary bias, some kind of institutional device aimed at enforcing the central bank’s credibility is required. Barro and Gordon (1983) suggested, within a repeated-game framework, that credibility may result from reputation: in order to avoid punishment, monetary authorities seek to convince the private sector by implementing the announced target rate of inflation effectively at every stage of the game. Rogoff (1985) suggested that a central banker with a stronger aversion to inflation than the government (that is, a “conservative” central banker) is more credible. These seminal

contributions gave rise to an abundant literature on central bank independence, central banker mandates, and monetary/interest-rate policy rules.

Rational expectations play a crucial role in the New Classical attack against discretionary policy. However, the idea that rational expectations cannot be deceived systematically is wrong, although it would be acceptable as an assumption in the case of an ergodic system. In such a system, the model of the economy is objectively reliable, because ergodic systems have invariable, “natural” properties that are objectively predictable and that the model captures (Davidson, 1991). In the real (non-ergodic) world, on the other hand, the equilibrium rate of unemployment has no predictable anchor, because the future is fundamentally uncertain. Indeed, according to Keynes (1936), the equilibrium rate of unemployment is a variable of the “shifting equilibrium”, whose level depends on the subjective “views about the future”. As these views are deprived of an objectively predictable anchor, so is the equilibrium rate of unemployment. Therefore, when the rate of unemployment changes owing to some policy stimulus, one cannot objectively assert that it is deviating (or not) from a pre-determined “natural” level. It may lower, on the contrary, to get closer to full employment as theorized by Keynes (*ibid.*). The idea that a discretionary monetary policy could deflect the economy from a pre-determined “natural” equilibrium just does not make sense. The so-called time inconsistency of discretionary policies vanishes in the real world. It is a mere invention that only makes sense in the fictitious ergodic world of New Classical and New Keynesian economics.

ANGEL ASENSIO

See also:

Central bank credibility; Central bank independence; Credibility and reputation; Forward guidance; Inflation targeting; Interest rate rules; Phillips curve; Rules versus discretion.

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Tobin tax

Since the 1980s, successive financial crises have generated increasing instability, which has triggered two effects: on the one hand, they have destroyed the belief in financial markets’ efficiency; while, on the other hand, they have reinforced the conviction of the necessity for appropriate regulations.

One of the proposed financial regulations attracted widespread attention, namely the Tobin tax. James Tobin invented it already in the early 1970s (see Tobin, 1974) but set out its final and detailed formulation only in a 1978 article (see Tobin, 1978).

In its initial version, the expected purpose of the Tobin tax is straightforward: the tax

must increase the autonomy of monetary policies by imposing obstacles to capital flows caused by the differential between domestic and foreign interest rates.

Tobin aimed at addressing the issues raised by floating exchange rates and the mobility of financial capital between countries, both of which have been induced by the demise of the Bretton Woods system in 1973. He draws the conclusion that, in this framework, a differential between domestic and foreign interest rates gives rise to important capital flows between countries, which lead to an appreciation or a depreciation of the relevant exchange rates. In the first case, the country's competitiveness diminishes, while in the second case there could be a rise in its rate of inflation. Taxing inflows and outflows of capital at a 1 per cent rate would reduce the rate of earnings on international assets. This should increase the degree of freedom of monetary authorities in determining domestic interest rates.

Tobin would, in the course of time, change the role of its "eponym" tax (Eichengreen et al., 1995; Tobin, 1996). Henceforth, what is also at stake is the fight against financial speculation, which, from a Keynesian perspective, is considered as a destabilizing factor. Indeed, the principle of a tax on financial transactions was first discussed in Keynes's *General Theory* (1936). But Keynes's and Tobin's projects are not exactly the same. For Tobin, a very low tax rate (between 0.1 and 0.25 per cent) would have no impact on a financial investor targeting the very long term. By contrast, such a tax rate could be costly for a financial investor targeting an increase in short-term operations on foreign currencies. Thus, in its new form, the Tobin tax embodies the purpose of discouraging speculation by lengthening the temporal horizon of financial investors. Hence, it should encourage them to pay more attention to the fundamentals of domestic economies, which should stabilize exchange rates.

Independently of its inventor, who in a 2001 interview to the German magazine *Der Spiegel* emphasized his faith in globalization, the Tobin tax has recently been revived in some different forms. Some international organizations against free trade (like ATTAC in France) believe that the Tobin tax, while reducing the scourge of speculation, could generate enough funds to reduce inequality and poverty. Others (see the recent European Commission's proposal for a financial transactions tax) are going so far as to argue that the Tobin tax could be a "cornucopia" for public sector budgets at a time of austerity.

While enjoying some ubiquitous faith by the so-called "alter-globalization" movements sustaining a fair-trade world economy without speculation, the Tobin tax has also been criticized by many economists.

First, the staunchest pro-market economists, who still believe in the efficiency and rationality of financial markets, reject it. According to them (see for example Aliber et al., 2003), the Tobin tax could destroy market stability, because it would necessarily increase the volatility of exchange rates by discouraging arbitration operations, which, from a neoclassical perspective, stabilize exchange rates. These critics of the Tobin tax argue also that the tax could induce a shortage of liquidity.

Those who accept its principle but doubt both the ways to apply the tax and its efficiency also criticize the Tobin tax. In their view, the *sine qua non* condition of its efficiency is its endorsement by all countries. Were this condition violated, speculative transactions would mostly occur in those countries where the tax is not levied. Furthermore, it would be necessary to have a supranational authority to collect income generated by the Tobin

tax, in order to limit fraud. This institution would be endowed with the power to force “fiscal-heaven” countries to levy the tax.

In fact, what matters is that foreign-exchange transactions are now concentrated in very few financial centres. The reluctance of the two countries where the most important foreign-exchange markets are located, namely the United Kingdom and the United States (which account for more than 50 per cent of all foreign-exchange transactions), illustrates the difficulty raised by a universal imposition of the Tobin tax. One must also consider the risk of asset substitution: a Tobin tax targeting the spot foreign-exchange market only encourages the flight to derivative markets, in order to carry out disguised spot foreign-exchange transactions. Hence, all foreign-exchange transactions should be taxed.

Lastly, some prominent post-Keynesian economists, such as Davidson (1997), reject the presumed impact of the Tobin tax on the temporal horizon of investors. If the rate of return on a short-term investment is higher than the rate of return on a long-term one despite the payment of a Tobin tax, the latter will have no impact on the horizon of investors. According to Davidson (*ibid.*), there is in fact only one way to get a sound international monetary and financial system: to reconsider the Keynes plan presented in July 1944 at the Bretton Woods conference.

All in all, the Tobin tax represents one of the crucial components of what could be deemed a “tempting utopia” to fight the causes of financial instability.

SLIM THABET

See also:

Bretton Woods regime; Capital controls; Currency crisis; Efficient markets theory; Financial crisis; Financial instability; Financial transactions tax.

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Triffin dilemma

The Triffin dilemma is named after the Belgian-born Yale economist Robert Triffin. Referring to the role of the US dollar as the world’s key reserve currency under the Bretton Woods regime established at the end of the Second World War, Triffin identified the following conflict: that continued growth in global trade and production was dependent on an elastic supply of dollar liquidity, but the US’s gold holdings into which said dollar liquidity was convertible was essentially fixed. The United States and the world

were therefore facing a critical dilemma, Triffin concluded: either the United States could strictly control its balance of payments and tightly limit outflows of US dollars, which would protect the dollar and its gold backing but put the global economy on a deflationary trajectory, or the United States could tolerate whatever external deficit and expansion of US dollar liquidity that growth of the global economy might require, risking an eventual dollar crisis given that the dollar's gold backing would become increasingly thin over time (Triffin, 1961).

The Triffin dilemma concerns the foremost question in international monetary relations: which or what kind of currency should serve as international money? Given the circumstances prevailing at the time, the Triffin dilemma actually features two critical aspects and potential sources of tension. One is that convertibility of a currency into something else puts an important constraint on the issuer of that currency, whether used only nationally or internationally as well. Historically, this issue was long held to be an advantage and a safeguard against currency debasement. By contrast, Triffin alerted observers to the Keynesian concern that economic expansion presupposes growing liquidity, while monetary restraint and deflation would be adverse to economic growth. The other source of tension is that if one and the same currency serves both national as well as international monetary functions, this may present both special advantages as well as special challenges to the issuer of that currency compared to its international users.

Special advantages are mostly associated with enlarged policy autonomy and profits from currency issuance. Given that all other users of the international currency have to obtain their reserves in markets through exchange of products or assets or through borrowing whereas the issuer can simply produce these reserves, the currency issuer enjoys an extra degree of freedom in policy-making. If production of reserves actually uses up few real resources, the currency issuer also enjoys a profit (or "exorbitant privilege") in terms of products or claims obtained in exchange for those reserves.

In essence, Triffin pointed out that policy autonomy and special privilege from reserve currency issuance may prove illusory rather than real as soon as the convertibility commitment (of US dollars into gold) becomes binding – and that this might represent a problem not only to the issuer itself but also to the world at large. Put differently, and contrary to all good intentions at the Bretton Woods conference, the world economy might still be bound by the remnants of the gold standard: unless ways were found to sufficiently grow gold, the "barbarous relic" might still end up acting as a brake on economic growth.

On the other hand, special challenges are mostly associated with the potential need for the reserve currency issuer to generate overspending and tolerate persistent current-account deficits as the source of the global liquidity demanded. Accepting persistent current-account deficits will typically imply a certain degree of currency overvaluation (or lack of competitiveness), which may harm some industries more than others and also benefit some parts of the population more than others. Domestic political economy issues are thus bound to occur.

Historically, the Bretton Woods regime actually started out featuring a "dollar gap", the opposite of the dilemma Triffin identified later. At the end of the Second World War the United States had not only accumulated the biggest part of the global gold stock together with sizeable claims against European nations. In contrast to widespread

devastation in other economies, the US economy had also expanded strongly during the war and was in good shape to enjoy the peace. How could an indebted and devastated Europe obtain the US dollars needed to pay for the American products that European reconstruction was to depend on? And how could the United States sell its products and sustain economic growth in the first place if its potential buyers could not dispose of US dollars?

John Maynard Keynes had designed an ingenious plan to overcome these challenges through the creation of a new international currency, but his American counterpart Harry Dexter White prevailed at Bretton Woods (Bibow, 2009). White wanted to establish the US dollar as the unchallenged international reserve currency (Steil, 2013). He failed to grasp, however, how his foremost aim might conflict both with restricting other countries' right to restore their competitiveness through currency devaluation as well as with the prominent place he still reserved for gold in his international dollar order.

The former issue dominated in the US dollar gap of the 1950s; the latter then came to describe the dollar glut (or Triffin dilemma) of the 1960s. The former was addressed through the Marshall Plan, providing the world with US dollars through grants. The latter was ultimately solved through ending US dollar convertibility into gold in 1971.

Note that ending convertibility got rid of one aspect of the Triffin dilemma, and critics might argue that the risk of deflation was merely substituted by the risk of inflation now that the golden anchor was gone. However, fundamental conflicts would continue to arise between domestic and international policy requirements anyway.

Under the new circumstances, the reserve currency issuer does indeed enjoy a large degree of policy autonomy. The irony, however, is that other countries' defensive policy choices may come to place an enlarged burden on the reserve currency issuer in terms of satisfying the international demand for reserves through current-account deficits, which, in turn, are sufficiently large to create domestic tensions. Since the global financial crisis of 2008–09 the United States has resisted playing that part in the bargain that issuance of the global reserve currency tends to involve – and even by 2014 the world economy has yet to get its bearings. Ultimately, the conflict can only be overcome by the creation of an international currency that is not subject to national policy control – as suggested by both Keynes and Triffin.

JÖRG BIBOW

See also:

Bretton Woods regime; Financial crisis; Impossible trinity; Keynes Plan; Prebisch, Raúl; Reserve currency; Triffin, Robert.

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Triffin, Robert

Robert Triffin (1912–93) was a major contributor to the post-World-War-II debates on the reform of the international monetary system and a leading adviser to international institutions, national governments and central banks. Triffin began his career in 1941 as monetary advisor with the staff of the Board of Governors of the US Federal Reserve System, where he organized a research section on Latin America. During this time and until his departure in 1946, he provided advice on monetary and banking reform throughout Latin America and in particular in Honduras (1943), Paraguay (1943–44), the Dominican Republic (1945–46) and Ecuador and Guatemala (1945–46).

Triffin considered his advisory expert missions to be “truly revolutionary” as these placed the central bank and the financial system at the service of economic and social development (Triffin, 1947a, 1947b, 1981; Wallich and Triffin, 1953). In this regard, his approach to monetary and financial reform broke with the traditional monetary doctoring of the 1920s and 1930s focused on ensuring nominal stability and attracting foreign capital through the adoption of gold standard (and gold-standard-like) regimes (Kemmerer, 1927).

Triffin argued that the business cycle in Latin America was dominated by external rather than domestic factors. The imposition of rigid monetary standards deprived these countries of their monetary management capacity. Thus they were forced to adapt procyclically to external shocks which aggravated their intensity and effects on monetary and real variables (Triffin, 1944, 1947a).

Triffin argued that the behaviour of Latin American exports, concentrated in few commodities, reflected movements in external demand and the characteristics of the external business cycle rather than relative price variations as postulated by traditional theory. He also underscored the futility of exchange-rate devaluations in Latin America, which he compared to a “case of oligopolistic competition in which none of the sellers will usually be able to profit very long from price-undercutting policies” (Triffin, 1944, p. 112). Finally, he was of the view that financial flows reflected speculative investor behaviour (Triffin, 1941, 1944).

Triffin’s recommendations for reform aimed at increasing the policy space of monetary authorities and at expanding their policy toolkit with countercyclical instruments. According to the specific circumstances at hand, he proposed the use of reserve accumulation, capital regulation measures, the establishment of foreign-exchange controls and an active policy of re-discount and advances as a means to confront external shocks and dampen the fluctuations of the business cycle. In some cases, Triffin advised that central banks should concentrate all banking activities of the State including medium and long-term lending to productive sectors.

Two sets of circumstances contributed to the success of Triffin’s missions. First, they took place against a background of a development-friendly (“good neighbour”) foreign policy of the United States towards Latin America based on active financial and economic cooperation. This policy included, among others, the financing of trade expansion and development projects, measures for commodity price stabilization, balance-of-payments support and the provision of long-term development finance (Helleiner, 2009).

Second, Triffin was able to work and make recommendations with full independence from the US Federal Reserve Board headed at the time by Marriner Eccles. Following his

first mission to Paraguay, the report of the Board credited Triffin's success partly "to the confidence that my [Triffin's] independence from foreign instructions had imparted to the Paraguayans" (Triffin, 1981, pp. 242–3).

Third, Triffin benefited from the advice of monetary experts, in particular that of Raúl Prebisch. Prebisch's expertise was crucial in ensuring the success of Triffin's first mission to Paraguay, especially in the area of foreign-exchange controls, which Prebisch had applied, earlier on, in his own country, Argentina, as governor of its central bank (1935–43) (Triffin, 1945; Haberler, 1947).

Following his departure from the US Federal Reserve, Triffin became head of the Exchange Control Division at the International Monetary Fund until 1948, where he developed a proposal for a European Clearing Union that was embodied in the European Payments Union Agreement signed in 1950.

In 1951, Robert Triffin returned to academia and in 1960 published the book *Gold and the Dollar Crisis*, perhaps his most renowned work. In that book he identified a key dilemma (that is, the Triffin dilemma) facing the Bretton Woods system: the dual role of the United States as a provider of world liquidity and at the same time as the guarantor of confidence in the US dollar.

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See also:

Capital controls; Dollar hegemony; Federal Reserve System; Impossible trinity; International Monetary Fund; Money doctors; Prebisch, Raúl; Triffin dilemma.

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¹ The opinions here expressed are those of the author and may not coincide with those of the institutions with which he is affiliated.

Twin crises

The term “twin crises” refers to the nearly simultaneous occurrence of both banking and balance-of-payments or currency crises in emerging economies. Prior to the 1980s, when financial markets were more heavily regulated, it was not common to observe both widespread financial institution failures (banking crises) along with currency devaluation in the face of foreign-exchange market pressure (currency crises) (see Kaminsky and Reinhart, 1999). However, beginning in the 1980s, crises in both banking and balance of payments occurring at around the same time have become much more frequent. Such twin crises episodes have included Argentina in the early 1980s, Sweden in the early 1990s, Mexico’s “Tequila crisis” of 1994–95, and the notorious Asian crises of 1997–98, which swept through Thailand, Indonesia, Malaysia, the Philippines and South Korea. Later, Russia (1999) and Argentina (2001–02) would also experience such episodes. As noted, these crises usually occur in emerging economies, and, unlike currency crashes in industrialized countries, such as the European Exchange Rate Mechanism crisis in the early 1990s, are associated with large drops in output and recessions.

Kaminsky and Reinhart (1999) cite a number of theories on how twin crises may occur. A currency peg that is under pressure can affect official reserves and make bailing out a troubled banking sector difficult, while weakness in banks can also strain government resources, leaving fewer reserves available for defending an exchange-rate peg. The authors cite Stoker (1995) and Mishkin (1996), who posit that currency devaluation can damage banks’ balance sheets. Mishkin (1996) notes that currency crises are particularly difficult for banks that have foreign-currency liabilities, as depreciation of the domestic currency implies a large increase in the value of bank liabilities and possible failure. However, Reinhart and Rogoff (2009) establish that, empirically, banking problems precede balance-of-payments crises in these episodes. This timing (first banking failures, then currency devaluation) was also found by Demirguc-Kunt and Detragiache (1998). Of course, regardless of timing, the two crises can exacerbate each other: a banking crisis can deplete the government’s holding of reserves, which then makes defending the exchange-rate peg harder, and then devaluation will exacerbate banks’ balance-sheet problems, and so on in a vicious circle. Radelet and Sachs (1998) emphasize the problems of a government that seeks both to act as a lender of last resort to the banking system but also to defend an exchange-rate peg. The authors note the similar situation faced by the US Federal Reserve during the Great Depression: the US central bank, created to backstop the banking system, may have been hesitant to do so, as providing bank bailouts would have endangered the dollar’s gold parity. And indeed the United States notably stayed on the gold standard until 1933, after many other countries had abandoned their currencies’ link to gold.

Twin crises have been followed by a large decrease in support of capital account liberalization. Rodrik and Subramanian (2009, p. 113) point out that, prior to the 1997 Asian crisis, “there was an emerging consensus among leading macroeconomists that it was time for emerging markets to embrace the liberalization of their capital accounts”. The International Monetary Fund (IMF), in conjunction with the US Treasury Department, had indeed previously supported capital account opening. The case for financial globalization seemed straightforward from a neoclassical point of view: capital could thus flow from wealthy industrialized countries to emerging markets, which would, according to

the logic of the Solow–Swan model (see Solow, 1956), enhance economic growth in the latter as well as providing portfolio diversification benefits in the former. Furthermore, theoretically financial globalization could in principle provide greater macroeconomic stability in emerging markets. Rodrik and Subramanian (2009) point out, however, that the logical case for financial globalization is much more mixed, and the empirical evidence on the purported positive effects of open capital accounts is at best mixed and fragile. In practical terms, the Asian as well as subsequent crises such as those in the euro area have led to much less enthusiasm for financial globalization. In 2012, the IMF officially accepted that capital controls could be a tool that emerging markets can employ to help maintain macroeconomic stability.

WILLIAM MILES

See also:

Capital controls; Currency crisis; Financial crisis; International Monetary Fund; Lender of last resort.

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U

Usury laws

Usury is an act of lending money at an excessive, oppressive or illegally imposed rate of interest that is higher than the legal rate authorized by law or charged by banks or licensed institutions. The origin of the term “usury” comes from the Latin word *usura*, meaning excessive, transformed to *usuria* in medieval times. In Anglo-French Latin, usury means interest or anything received over and above the principal (Wilson, 1963, p. 184). As De Roover (1967, p. 258) explains, “[u]sury was an excess whatsoever above the principal of a mutuum, or loan, exacted by reason of the loan itself, either according to contract or without previous agreement”.

The term “usury” was introduced in the fourteenth century, although the act of usury has been practised for more than 4000 years. This can be found in the Babylonian code of Hammurabi, the Book of Deuteronomy of the Old Testament, and the Qu’ran. In the eighteenth century, usury started to be sanctioned. Led by England, usury was outlawed. The English government started to involve itself in the banking system by setting legal interest rates. However, in an earlier attempt dated 1545, under Henry VIII’s Parliament Act, interest payments over 10 per cent were considered usury (Richard, 1965, p. 19). This Act was revised in 1571 with many amendments until the abolition of the usury law in 1854.

Prohibitions against usury and its condemnation can be traced back to ancient times, mainly driven by followers of Hinduism, Buddhism, Judaism, Islam and Christianity. For instance, prohibitions against usury can be found in the Biblical Book of Ezekiel, whereby usury is compared to extortion and a grave sin. The Church sustained a virulent anti-usury doctrine in the Middle Ages. Similarly, Islam totally prohibits usury or financial interest, which is called *Ar-Riba*. *Riba* is an Arabic word meaning “excessive” as regards the price or the amount of loan repayment, and this is against the *Sharia* or *Islamic jurisprudence* on lending activities. Economic activities based on *riba* are considered as sins.

Most of the usury laws were considered arbitrary and unfair, as they were freely determined in agreements between the owners of capital and borrowers. Under modern conventional laws, the usury rate is the maximum legal rate of interest that can be imposed. At present, if the owner of capital, whether an individual or an unlicensed financial institution, is involved in lending and borrowing or taking deposits from public, or involved in the “black money market”, the party will be charged in a court of law. Any interest rates imposed upon borrowers above the official interest rate set by the central bank, by licensed or unlicensed financial or non-financial institutions, are assumed to be usury and considered a crime. The Penal Law in Europe and in the United States, and the Criminal Law in Canada, consider activities such as imposing an interest rate above the rate set by the central bank as a crime. Although there are laws that hinder such activities, the activities of lending and borrowing in the black money market still prevails in most developing countries as well as developed countries.

A new form of usury or lending in the black money market has emerged alongside the modern banking system. Loan sharks, shylock and other illegal activities, US

non-standard lenders, Malaysian and Singaporean *Ah Long* (unlicensed money lenders) are all part of this modern usury system. Countries such as the United States or Canada have established usury protection laws. However, in less developed countries there are no such laws. In the black money market the principal victims are people in distress who can no longer borrow from the “legal” money market. In many cases, the borrowers (debtors) become slaves to the capital owner (creditors). This modern form of usury can lead to debt-slavery or debt-bondage with the landlord. Suicide is sometimes considered the only solution for borrowers to escape debt-bondage.

In the conventional banking system, banks try to avoid offering loans to low-income groups or to high-risk borrowers. The US 2008 financial crisis serves as a counter-example of this dire phenomenon. Before the subprime crisis exploded, US banks extensively made loans to a group of new borrowers via toxic subprime-mortgage-related securities amidst a growing real-estate bubble. This was made possible because the banks were permitted to pass down and transfer risks via a range of new, sophisticated financial mechanisms and obscure derivatives. To attract high-risk borrowers, low interest rates and ease of reimbursement were offered via the most attractive packages. With the reversal of interest-rate trends and the housing market collapse in 2007, borrowers fell into distress because they could no longer make their monthly loan repayments. Outside of the 2008–09 global financial crisis, the conventional way of doing business by banks follows the rule of thumb where higher interest rates are charged to higher-risk borrowers within usury law limits.

Islamic banking takes the opposite approach, in that lenders and borrowers operate within a system of interest-free loans (or banking). Interest of any kind (*riba* or usury) is forbidden in Islam. Activities of lending and borrowing are allowed but principally on profit-sharing (*mudarabah*) or joint-venture (*musyarakah*). Transactions are ruled under risk sharing unlike conventional banking based on risk transfer. Islamic banking institutions make profit by lending money but the loans are paid via a buy-and-sell agreement with a zero interest rate, not via interest payments. For example, instead of borrowing money for a purchase, it is the bank that will purchase and then resell the purchased item at a price agreed upon by both parties. The agreed purchase price of assets is based on the value of the assets in the future, and the capital owners or banks will set quantum payments at a zero interest rate.

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See also:

Financial crisis; Housing bubble; Interest rates setting; Money and credit; Policy rates of interest.

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V

Volcker experiment

Paul Adolph Volcker took office as President of the Federal Reserve (Fed) in August 1979. At that time, the inflation rate in the United States was very high and persistent, around 12 per cent. This led Volcker to believe that the first, if not exclusive, objective of US monetary policy was to reduce the rate of inflation (see Clarida et al., 2000).

Firm in his beliefs, in September 1979, following the traditional procedure of targeting interest rates, Volcker proposed to the Fed Board to increase the interest rate on federal funds. The approval of this proposal, with only a narrow majority within the Board, was received by the market as a signal that the Fed was not firmly convinced in pursuing a disinflationary monetary policy (Silber, 2012, p. 180).

Realizing that incremental changes in the interest rate on federal funds would not work, Volcker, in early October 1979, led the Federal Open Market Committee (FOMC) to adopt new monetary procedures (see Mehrling, 2007, p. 180). Before October 1979, changes in the monetary policy stance were gauged by changes in the target for the rate of interest of federal funds. These changes, however, occurred rarely. With the adoption of the new procedures, the Fed began to target the monetary base instead of the interest rate (see Lindley et al., 2005). By setting this new operational target, in particular by setting a target for an important component of the monetary base, namely banks' non-borrowed reserves, the FOMC led interest rates to adjust in such a way as to close the gap between the demand for reserves by banks and the supply of reserves by the Fed.

Volcker opted for the adoption of these new monetary procedures for different reasons. First, it would have been politically costly for the Fed to set a target for interest rates as high as the process of disinflation would have required. Second, targeting non-borrowed reserves meant imposing a rule from which it was "difficult to back off even if [...] decisions led to painfully high interest rates" (Volcker and Gyohten, 1992, pp. 167–8). Finally, the use of a monetary target allowed the Fed to communicate explicitly the final goal of its monetary policy.

In the months following the adoption of the new procedures, the federal funds rate of interest increased significantly: its level in March 1980 reached 17.2 per cent (it was 10.9 per cent in August 1979). The short recession that followed the tightening of monetary conditions and the introduction of selective credit controls by the Carter Administration led the Fed to ease its monetary policy. This brought a recovery in economic activity, but had a negative impact on inflation and inflationary expectations.

The disinflationary process of the US economy effectively began at the end of 1980, after the election of President Reagan, when the monetary policy stance of the Fed came again to be strictly restrictive. Between September and December 1980, the federal funds rate of interest went from 10.9 per cent to 18.9 per cent. It remained very high in both nominal and real terms throughout 1981 and for a large part of 1982. At the end of that year, the annual inflation rate was 6.2 per cent (it was 13.5 per cent in December 1980). The disinflation of the US economy was thus completed, even if it was associated with relevant output losses (see Goodfriend and King, 2005, p. 983).

The reasons for this success were threefold. First, Volcker made inflation control the

main goal of US monetary policy. Previously, this goal had been abandoned as soon as the unemployment rate started to increase. Second, in pursuing disinflation, Volcker gave crucial importance to expectations (see Hetzel, 2008, p. 151). Third, contrary to previous attempts, Volcker's disinflation had public support (see, among others, Meltzer, 2009, p. 1128).

Despite its contribution to disinflate the US economy, the operational goal of non-borrowed reserves had some drawbacks: it favoured an increased volatility of both interest rates and monetary aggregates. Therefore, in the fall of 1982, the FOMC changed its monetary policy procedures, adopting a borrowed-reserves target. These procedures were substantially similar to a target for the federal funds rate of interest. However, differently from the past, the FOMC changed the federal funds rate of interest pre-emptively. Accordingly, in the first part of 1984 the Fed reacted to an increase in inflation expectations with a significant increase in the federal funds rate of interest: in this way, the Fed consolidated definitely its anti-inflationary credibility.

The "Volcker experiment" led to important changes in the conduct of monetary policy (see Friedman, 2005, p. 326; Goodfriend, 2005, p. 249). On the one hand, it made price stability the true final goal of monetary policy. On the other hand, it showed the importance for central bankers of paying attention to expectations and resorting to rules in order to tie their hands.

GIUSEPPE MASTROMATTEO AND GIOVANNI BATTISTA PITTALUGA

See also:

Central bank credibility; Chicago Plan; Convertibility law; Credit controls; Federal Open Market Committee; Greenspan, Alan; Interest rates setting; Monetary aggregates; Monetary targeting; Rules versus discretion.

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Vulture fund

A vulture fund (or distressed debt fund) is a type of hedge fund that purchases distressed debt securities at a discount on the secondary market with the intention of obtaining the

face value of the securities and turning a profit. This investment strategy involves the fund using a legal event such a default or a restructuring as an opportunity to litigate for creditor compensation above the discounted purchase value of the distressed debt. While there are instances of these funds targeting distressed corporate debt issuers (such as during the bankruptcy of American retailer Kmart; see Lim, 2012), the notoriety of vulture funds has been largely gained by their targeting of the sovereign debt of developing economies.

The emergence of vulture funds as players in sovereign debt markets followed the development of the Brady bond market in 1989, which was created to restructure a significant amount of non-performing foreign bank loans to several Latin American countries (see Organisation for Economic Co-operation and Development, 2007). In converting syndicated bank loans (jointly made by a group of lenders) into tradeable US dollar-denominated bonds, the banks were able to move these debts off their balance sheets and ultimately reduce the risk of asset concentration. Prior to this innovation (essentially a form of securitization), there was a tendency among lenders to cooperate in restructuring a loan when the debtor could no longer meet its obligations, even if restructuring meant that the lenders would take a “haircut” (a reduction in asset value). With the growth of the sovereign bond market in emerging economies following the advent of Brady bonds, it has become possible for the current owner of debt to not necessarily be the originating lender. This eroded the incentive to cooperate with other creditors. After acquiring distressed securities at a discount on the secondary market, the non-cooperating “holdout” creditor seeks to block through legal action any restructuring negotiations in progress, and then sue for the full value of its debt holdings with no “haircut”. At the core of this investment–legal strategy is reference to the *pari passu* clause featured in debt contracts, which directs that all creditors will be treated equally.

Since their appearance, cases of successful litigation by vulture funds of developing countries include *Elliot Management versus Peru* (2000) and *Donegal International versus Zambia* (2007) (see Fukuda, 2008). This has given rise to the ethical question of profiting from a debt default, especially when the sovereign is a low-income economy. Further, even the threat of litigation by a vulture fund can interrupt an orderly restructuring process and restrict the supply of credit, as it can diminish creditor confidence and heighten legal uncertainty. The potential stampede of exiting investors triggered by vulture fund activity can precipitate other defaults, drain foreign-exchange reserves, and risk macro-financial instability, ultimately diverting resources away from development expenditures.

These issues have led to public awareness campaigns by non-governmental organizations such as Oxfam and the Jubilee Debt Coalition, the latter whose efforts led to the passing of the United Kingdom’s *Debt Relief Act* in 2010, which prohibits vulture funds from collecting disproportionate settlements in that country.

A legal development that has reduced the vulnerability of debt issuers in distress is the increased inclusion of collective action clauses (CACs) in debt contracts. A CAC allows for a “supermajority” of creditors (more than 50 per cent) to agree to a debt-restructuring that is legally binding on all creditors, including holdouts. As of 2006, 60 per cent of outstanding sovereign bonds issued in international markets featured CACs, negating the *pari passu* clause (Fukuda, 2008).

Yet despite these initiatives, vulture funds remain active in the global debt market. In May 2012, the Greek government made a 436-million-euro bond payment to holdout

investors who rejected the country's debt restructuring deal negotiated in March (Landon, 2012). At the time of writing (May 2013), the Argentine government is challenging a US Court of Appeals ruling in October 2012 that Argentina must treat equally all holders of the 95 billion US dollars of debt that went into default in 2001 (Porzecanski and Russo, 2013). This court decision was a factor behind the recent resurrection of the International Monetary Fund's proposed bankruptcy framework for sovereign states, the Sovereign Debt Restructuring Mechanism or SDRM (see International Monetary Fund, 2013). First developed after Argentina's 2001 default (but shelved after lack of support from the United States), the intent of the SDRM was to facilitate more predictable and orderly sovereign debt restructuring. By doing so, this would offer the debtor nation legal protection from litigation, providing it negotiates in good faith.

The evolution of vulture funds serves as a parable of the unintended consequences of institutional change under financial capitalism. Originally conceived to alleviate commercial banks of debt overhang created by distressed sovereign issuers, the Brady bond as a financial innovation was exploited by some market actors for private profit but at public cost. It may be argued that in situations where the target is a corporation, the vulture fund acts as an agent of creative destruction (see Schumpeter, 1942), hastening the exit of weaker firms and applying a market discipline to debt management. However, when the target is a sovereign state, the state does not "exit" but can weaken under increased fiscal burden (through its exposure to international creditors) and risk failure. The challenge then for policy makers is to design institutions, whether financial instruments or legal devices, which minimize the risk of being ultimately used for purposes counter to their original intention.

DAVID PRINGLE

See also:

Financial crisis; Financial innovation.

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W

White, Harry Dexter

Born in Boston on 9 October 1892 as the youngest of seven children in a family of Lithuanian origin, Harry Dexter White enlisted in the US Army and practiced as a lieutenant during the First World War in France. After his studies in economics at Columbia University and at the University of Stanford, he obtained a PhD at Harvard University by writing a thesis on French international accounts (White, 1933), where he warned about the risks associated with international capital movements.

After four years of teaching at Lawrence College in Appleton, Wisconsin, Jacob Viner invited him to join the US Treasury Department in 1934, where he began a fast ascent and was in charge, almost from the beginning, of US and foreign exchange problems. His active role in several works such as the planning of the Inter-American Bank or the “Morgenthau Plan”, as well as the creation of the Tripartite Agreement and the US Exchange Stabilization Fund, gave him important background experience before his official incorporation, in 1941, to the international discussion on the new monetary order.

As the new assistant to US Treasury Secretary Henry Morgenthau Jr, following the attack on Pearl Harbor, White was asked to elaborate the US monetary plan during the war and the post-war period. The result of this request was a plan (called the White Plan) used subsequently by the American delegation and headed by White himself in international monetary discussions at the Bretton Woods conference (July 1944).

From the beginning of the negotiations, Americans shared the initiative with the British delegation, whose plan was written and defended by John Maynard Keynes. The tough discussions between White and Keynes, until the final agreement in July 1944, proved the existence of great divergences between the two proposals.

Both delegations, American and British, prioritized avoiding the use of competitive devaluation among nations, so common during the Great Depression of the 1930s. White, close to Keynes's economic approach, agreed with the necessity of multilateral capital controls and exchange-rate stability for securing macroeconomic conditions that would ultimately relaunch liberalized international trade and the “flow of productive capital”.

Inspired by the Inter-American Bank project, White's “Preliminary Draft Proposal” of April 1942 envisaged a Bank for Reconstruction and Development and an International Stabilization Fund (ISF). The first institution would provide long-term capital for helping in the post-war reconstruction. The second institution would grant exchange-rate and international payment stability. The initial exchange rates would have to be determined by the ISF and would only be changed “when essential to correction of a fundamental disequilibrium” – as was also suggested in the Keynes Plan – and “only with the consent of four-fifths of members' vote” (Horsefield, 1969, p. 89).

However, the US delegation was far from accepting, for the ISF, the mechanism of an International Clearing Union (ICU) conceived by Keynes. It understood that the ICU threatened US monetary sovereignty and the management of its balance-of-payments

surpluses. This is why White, instead of an international unit of account (the *bancor*) recording all international operations, proposed a fund subject to its members' initial contributions. This fund could facilitate bilateral payments among countries by buying and selling gold or convertible national currencies.

After several discussions and renewed drafts between 1942 and 1944, the new international monetary architecture, agreed at the Bretton Woods conference, reflected the main elements of White's initial proposal, with the creation of the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD) (usually called the World Bank). Furthermore, in addition to gold, the US dollar was accepted as the reference for the fixed exchange rate of all other national currencies.

In 1946, White himself was named first US Executive Director at the IMF by President Harry S. Truman. In March 1947, however, health problems caused his resignation. On 16 August 1948, he died of a heart attack.

Three days before his death, White was requested to testify by the US House Committee on Un-American Activities. There had been suspicions about his activities as a Soviet informer since the late 1930s. A decade later, in the middle of a growing anti-communist campaign, the US State Department had already collected some evidence of White's service to the Soviet intelligence.

During his years working for the US Treasury, White kept in contact and surrounded himself with numerous colleagues and friends who were later accused of spying for the Soviet Union. His Soviet-friendly position in the post-war scenario as well as meetings with several officials of that country in the frame of international monetary discussions strengthened theories about White's informing tasks.

Eventually, clear evidence was provided by the testimonies of defecting Soviet agents and Communist Party members – such as Whittaker Chambers and Elizabeth Bentley – in the late 1940s and 1950s. According to Bentley's statement, White had supplied communists with sensitive US Treasury information, as well as printing plates of allied countries' currency ready for use in occupied Germany.

The public release in the 1990s of some VENONA decoded files between Soviet officials and Moscow – in which White is named under the pseudonym JURIST – along with KGB agent Alexander Vassiliev's version of events, have reopened the debate about White's espionage affair.

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See also:

Bancor; Bretton Woods regime; Capital controls; Dollar hegemony; International Monetary Fund; Keynes Plan.

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Wicksell, Knut

Knut Wicksell (1851–1926) was a Swedish neoclassical economist. Also known for his radical lampoons and his provocative attitudes, he was a prolific author, whose peers' recognition was late, even posthumous. He addressed several topics in economic analysis, among which the main ones were value theory, public finance, and monetary theory.

The monetary theory of Wicksell (1898 [1936], 1906 [1935], 1907) reformulates the quantity theory of money, according to which a change in money supply implies a direct and proportional variation of the general price level, in order to make it compatible with bank money – devoid of any intrinsic value. If the quantity theory represents, according to Wicksell (1906 [1935], p. 141), the only scientific explanation of the value of money – consistent with the Currency Principle – it nevertheless matches the facts badly. Indeed, according to this theory, an increase in the quantity of money causes a decrease of its price – that is, the rate of interest. However, empirical studies on this subject reveal a positive correlation between the rate of interest and the prices of goods. To that extent, Wicksell (1898 [1936], pp. 122–56) formulates an important synthesis by theorizing an indirect influence, via the rate of interest, of a variation in the money supply on the general price level.

The main criticism addressed by Wicksell (1898 [1936], pp. 50–79; 1906 [1935], pp. 58–126) against the quantity theory of money concerns the assumption of a fixed velocity of circulation of money. According to him, the velocity of money depends on the way credit is organized – credit actually accelerates the velocity of money. In this regard, he distinguishes three stages of development: the pure cash economy, the simple credit and the pure credit economy. The latter is defined as “a state of affairs in which money does not actually circulate at all [. . .], but where all domestic payments are effected by means of the Giro system and bookkeeping transfers” (Wicksell, 1898 [1936], p. 70). Thus, money represents a bookkeeping entry that banks can, according to the demand for loans, create *ad libitum* (in its “velocity dimension”). Consequently, the banks' rate of interest is not the equilibrium price as determined on the money market, but an instrument at the discretion of banks. In this respect, the bank's function of issuing money adds to its traditional function of financial intermediation.

On the loanable market funds, banks function as financial intermediaries, which allocate available savings to investment. Wicksell (1898 [1936], pp. 101–21; 1906 [1935], p. 193) calls the equilibrium rate of interest on this market, which also corresponds to the anticipated marginal productivity of capital, the “natural rate of interest”. The latter rate only coincides rarely with the banks' rate of interest. Whereas the anticipated marginal productivity of capital changes continuously, under the effect of real shocks hitting the economy, banks change their interest rate only in a discontinuous way (Wicksell, 1898 [1936], p. 105). Thus the difference between these two rates of interest induces a disequilibrium on the loanable funds market (which is also a disequilibrium between aggregate supply and aggregate demand), which banks compensate by issuing money.

Suppose in this respect that a real shock increases the natural rate of interest above the banks' rate of interest. This discrepancy offers to capitalists an opportunity for earning an (extra) profit: the rate of interest they pay on their borrowings is indeed lower than the marginal productivity of capital, and decreases the incentive for savings, leading to an increase in the demand for investment and consumption goods, as well as an increase in

the general price level. As the latter increase induces another opportunity for capitalists to earn a profit, this process, which Wicksell (1898 [1936], p.94) describes as “cumulative”, continues as long as the banks’ rate of interest is lower than the natural rate of interest, and ends when “monetary equilibrium” is restored – that is, when these two rates of interest are equal. When the issuing of money is constrained by gold reserves, the aforementioned process ends when banks, to avoid a tapping of their gold reserves caused by a rise in the general price level, increase their rate of interest. In a pure credit economy, this process ends when the central bank increases its policy rate of interest to a sufficient level to force banks to restore “monetary equilibrium”. In this respect, the conduct of monetary policy should be governed by an interest rate rule aiming at ensuring this equilibrium; that is, stability of the general price level.

Wicksell (1906 [1935], p.205) imputes to the banks’ passivity the responsibility of the cumulative process (even the origin of the latter is “real”). Banks only increase their rate of interest according to the current general price level (which already initiated a new increase of the natural rate of interest). Thus, the (relative) level of banks’ rate of interest is always insufficient to stop the cumulative process (subject to the aforementioned tapping of the banks’ reserves or the intervention of the central bank). In this framework, the cumulative process implies a concomitant rise of the general price level and the rate of interest, which confirm the empirical findings mentioned above. Now, the irreversible increase in the general price level induced by the cumulative process also validates, at the equilibrium, the positive implications of the quantity theory, because the issuing of money caused by an increase in the natural rate of interest induces demand-pull inflation. In other words, the (inflationary) gap between the banks’ rate of interest and the natural rate of interest causes an issuing of money, which increases the general price level. This confirms the existence of an indirect effect, via the rate of interest, of a variation of the money supply on the general price level.

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See also:

Banking and Currency Schools; Bank money; Endogenous money; Inflation; Interest rate rules – post-Keynesian; Interest rates setting; Money supply; Natural rate of interest; Quantity theory of money.

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Y

Yield curve

The yield curve plots the yield from a class or category of bonds against the times to maturity of such bonds. The most representative category tends to be government bonds (for instance, 3-month, 2-, 5-, 10- and 30-year Treasuries) on the horizontal axis plotted against their respective yields on the vertical axis. This will give a curve normally rising from left to right with a positive slope, depicting a general phenomenon, as everyone with a bank account knows: interest rates paid on sight deposits are much lower than the interest rates at which banks lend over the long run. This pattern can be seen applying to all bonds.

Risk is the basis of the conventional explanation of the yield curve. It is split into a default risk – the borrower cannot pay the interest, or cannot repay the principal – and market risk – the current market returns are greater than those from the security, creating a capital loss in the value of the security. (If the security is sold there is a capital loss, if held to term there is an opportunity cost.) The supposition is that the longer the time to maturity the greater will be both kinds of risk, therefore the higher the compensation. This is plausible, but not a strong argument; there are obviously many other factors involved in risk.

A better explanation relies on expectations (Walsh, 2003, pp.488–91). Long rates are considered to be an average of expected short rates. The theory argues that under normal conditions, at a given “present time”, portfolio managers and financial traders expect future interest rates to be higher. Hence long-term bonds must be priced at present to give higher yields than current short-term rates. Most traders and firms are optimistic most of the time, so usually the yield curve will be normal (to wit, upward sloping). When bearishness takes over, after the business cycle peak, the yield curve will become inverted. So the shape of the yield curve is a good indicator of recessions (Estrella and Mishkin, 1998; Cwik, 2005).

However, this approach treats expectations as uniform and stable. Real economic agents, by contrast, do not agree on when the economy peaks, and have varying and changeable expectations. Even worse, as time passes, the impact of expectations on market behaviour can change. For instance, when a current low interest rate equilibrium is contrasted to an expected high interest rate equilibrium in the future, new long-term bonds now would have to be priced to compete with the returns anticipated in the future. So today’s long-term rates of interest would have to become higher. But why are equilibrium rates of interest higher in the future? Surely, it would most plausibly be because profits are higher, but as time passes the higher profits would tend eventually to pull up all rates of interest. There might be a period between today’s low-profit equilibrium and tomorrow’s high-profit equilibrium, when expectations only pull up long-term rates of interest, but as the movement into the future continues, short-term rates of interest will be affected, too. Unless, of course, the new equilibrium is one in which long-term rates of interest are high, but short-term rates of interest are not – precisely what we are trying to explain. This approach does not do the job.

Suppose instead that we consider market reactions to the news that interest rates are

going to change. Seeing a rise in yields ahead, holders of bonds that will mature in or after that time will want to sell them quickly to avoid capital losses, and invest the proceeds in currently available short-term securities. This will drive down the price of long-term bonds and raise the price of short-term securities. If the future is expected to be worse than the present (yields falling), the current price of bonds that mature after the decline will rise, attracting funds, leading to a decline in the price of short-term securities – an inversion. So this approach is promising. The catch is that it depends on the dynamics of speculation, which are notoriously volatile and unreliable, whereas the normal shape of the yield curve is pretty stable (Anderson et al., 1996).

The market segmentation (preferred habitat) theory holds that traders tend to prefer, for whatever reasons, to deal in securities of certain maturities. Some borrowers need funds for a short time, others for a long period. Traders become familiar with a class of clients and stick with them. Market segmentation theory stresses that financial instruments are not good substitutes and therefore their markets are independent. Preferred habitat theory stresses the distinct investment horizons of the agents in the two markets, and argues that agents with a short-term perspective predominate. Unfortunately, this makes it very difficult to explain why short and long markets tend to move together most of the time.

The liquidity theory holds that whether optimists or pessimists, portfolio managers and traders expect significant changes to take place in the uncertain future, and expect more of these the further ahead they look. It is an advantage to be liquid when big changes are in the works; hence the costs of illiquidity rise the longer the term to maturity. So the compensating “liquidity premium” must be higher for long-term bonds than for short-term bonds. An advantage of this approach is that it neither assumes equilibrium nor any specific dynamics.

If there is segmentation, the economy might have more than one no-risk rate of interest – a short-term basic rate of interest and a long-term rate, to which risk will be added. Preferred habitat/market segmentation theory suggests that different borrowers have different needs, so different markets might settle around different levels of the interest rate, independently of risk or liquidity preference. Businesses of all sizes and shapes borrow short for wages and working capital, and long for large-scale capital investments. Banks and financial institutions will specialize in supplying these funds. But for working capital to be available without a hitch from period to period, the supply of working capital funds must grow at the rate at which the wage bill is expected to grow. This will be the rate at which employment grows. So bank capital and finance capital must grow at this rate in order for these institutions to continue to supply the funds (Nell, 2011).

In the same way, for the funding of large-scale capital construction to take place regularly, the supply of long-term funds must grow at the rate at which aggregate demand is growing. This means that the capital of the financial institutions supplying such funds must expand at that rate. For the supply of funds to grow at a certain rate, the capital of the supplying bank or other institution must grow at that rate, which will happen if that rate is the rate of profit of that institution, and those profits are invested in expanding its capital. In general, aggregate demand grows more rapidly than employment (especially in recent decades). Hence, if these relationships hold, long-term interest rates will lie above short-term rates of interest.

Now suppose, following the peak of the business cycle, the boom stales and private

investment slumps. Profits will also fall, tending to pull down long-term interest rates. Automatic stabilizers, however, will kick in and hopefully a strong fiscal stimulus, based on deficit spending, will keep employment up. The deficit funds will end up as excess reserves, and banks will try to place them. For portfolios to absorb these excess funds, however, interest rates will have to fall – but the short-term rate of interest is pegged by the central bank and will tend to be high at the peak and after, to prevent inflation. So the whole burden of the adjustment will be borne by the long-term rate of interest. Hence the short-term rate of interest will stay where policy puts it, and the long-term rate of interest will fall – this could and has tended to end up as a yield curve inversion, preceding the recession.

EDWARD J. NELL

See also:

Asymmetric information; Central bank bills; Forward guidance; Interest rate pass-through; Interest rates term structure; Operation Twist; Quantitative easing.

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Z

Zero interest-rate policy

Zero interest-rate policy (ZIRP) is a situation in which the central bank is keeping the overnight nominal interest rate at or close to zero per cent. In modern times ZIRP was first initiated by the Bank of Japan (BoJ) in the Spring of 1999 in response to the low rate of economic growth and periodic deflation that the country had been experiencing since the collapse of the housing and stock markets in 1989–90. The ZIRP policy enacted by the BoJ was shortly thereafter followed by an initial experiment with Quantitative Easing (QE) and the two policies have become intertwined since then (Yoshitomi, 2005).

Many of the discussions on ZIRP are somewhat vague with regard to how this policy is supposed to work. In discussing one expert's exposition of that policy, Yoshitomi (ibid., p. 138) complains that it takes “for granted that ZIRP should be effective in overcoming deflation, but no theoretical or empirical evidence is provided” to support that assertion. After the global financial crisis of 2008–09, the US Federal Reserve and the Bank of England followed the BoJ and lowered overnight nominal interest rates to near zero per cent (0.25 per cent in the United States and 0.5 per cent in the United Kingdom). This was followed by extensive rounds of QE.

Some economists believe that a ZIRP environment is synonymous with the “liquidity trap” scenario portrayed in Hicks's (1937) reformulation of *The General Theory* (1936) in his IS–LM framework. This conception holds that under depression conditions the demand for money is infinitely elastic, because investors prefer to hold cash rather than bonds (Krugman, 2000). Thus in a liquidity trap monetary policy is unable to stimulate investment, and only adjustments in the fiscal stance of the government can increase output and employment. Others (Pilkington, 2013) have pointed out that this theory is not in-keeping with what has actually been experienced in a really-existing ZIRP environment.

Krugman (2000, p. 222), a proponent of the liquidity-trap view of ZIRP, argues that in a liquidity trap “changes in the money supply, which move LM back and forth, will have no effect on interest rates or output”. Pilkington (2013) by contrast has pointed out that, for example, the US money markets only displayed liquidity trap dynamics for a brief period between 2007 and 2009. After this period had passed, interest rates across the financial markets began once more to respond to changes in base money made by the central bank.

Monetarists insist that in a ZIRP environment not only will interest rates respond to increases in the supply of money but so will output and employment. With respect to the ZIRP situation in Japan, Friedman (2000, p. 421) argues that “[monetary authorities] can buy long-term government securities, and they can keep buying them and providing high-powered money until the high-powered money starts getting the economy in an expansion”. A school of economic thought called “market monetarists” has since arisen to further elaborate on Friedman's views. Market monetarists believe that central banks can get the economy back on a path to recovery even in a ZIRP environment.

Svensson (2003) claims that if central banks make commitments to higher price levels in the future, expectations will affect the foreign currency markets so that speculators

will drive down the exchange rate of the domestic currency. Svensson (ibid., p. 2) echoes Krugman (2000) in this regard, and equates a ZIRP environment with the idea of a liquidity trap wherein “the economy is satiated with liquidity and the private sector is effectively indifferent between holding zero-interest-rate Treasury bills and money”. He also argues that in such an environment there are many strategies that can be utilized to overcome the liquidity trap. These include:

announcing a positive inflation target; announcing a price-level target path; expanding the monetary base via open-market operations in Treasury bills and more unorthodox assets; reducing long interest rates via a ceiling on long interest rates or via a commitment to keep the interest rate equal to zero for a substantial time in the future; depreciating the currency by foreign-exchange interventions; introducing a time-varying exchange-rate target; introducing a tax on money; introducing more expansionary fiscal policy; affecting intertemporal substitution of consumption and investment by time-variable tax rates; and, finally, a policy of combining a price level target path, a currency depreciation and a crawling peg. (Svensson, 2003, p. 4)

Post-Keynesian economists are generally sceptical that monetary measures alone will be effective in promoting economic recovery in a ZIRP environment. Kregel (2011, p. 6) notes that Keynes advocated similar policies to QE and ZIRP in his *Treatise on Money* (1930), but that we now know that while these policies may have a substantial impact on asset prices and interest rates, they are ineffective at stimulating investment. The author also notes, however, that Keynes changed his views in *The General Theory* (1936). In it Keynes tied real rather than financial investment to the marginal efficiency of capital and tied this to expectations about a future that is entirely uncertain (Kregel, 2011, p. 7).

Furthermore, Keynes (1936, p. 94) points out that lowering the rate of interest can have deleterious effects on the marginal efficiency of capital, because “it means that the output from equipment produced to-day will have to compete during part of its life with the output from equipment which is content with a lower return”. Keynes also pointed out that lending institutions must have a high level of confidence if they were to fund investment spending once more, and this level of confidence was outside of the direct control of the central bank (Kregel, 2011, pp. 7–8). Finally, Kregel notes independently of Keynes that the substantial capital losses that result from a financial crisis have an enormous negative impact on the propensity to invest and the propensity to consume (ibid., p. 8). For all these reasons, post-Keynesian economists argue that fiscal policy must be the main tool for any government that finds itself in a ZIRP environment in order to return the economy to full employment.

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See also:

Bank of Japan; Effective lower bound; Interest rates setting; Liquidity trap; Negative rate of interest; Policy rates of interest; Quantitative easing.

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