Cambridge Journal of Economics 2017, **41,** 1539–1557
doi:10.1093/cje/bex051
Advance Access publication 1 August 2017

Central banking in the twenty-first century

Sheila Dow*

The recent banking crisis has opened up the discourse about central banking. The purpose here is to revisit the principles of central banking and the theoretical framework for applying them in light of these changed conditions. We focus on different understandings of the economic process and how they relate to the principles of central banking, comparing the dominant technocratic approach to central banking theory with a more traditional political economy approach. We consider the recent use of 'unconventional' tools of monetary policy and a range of current proposals for reform of money, banking and central banking. It is argued that central banking needs a new framework which recognises the interdependencies between the conditions for monetary stability, financial stability and economic stability and between the policy measures by which these goals may be addressed.

Key words: Central banking, Inflation targeting, Central bank independence
JEL classification: E02, E05, E44, E61

1. Introduction

The Bank of England's website describes the Bank's mission as being 'to promote the good of the people of the United Kingdom by maintaining monetary and financial stability.'[1] This statement is not in itself very controversial as a statement of purpose of a central bank. What is potentially controversial is how monetary stability and financial stability are understood, how they promote the good of the people, how they should be achieved and whether achievement is feasible.

Here we consider how far the prevailing understanding within the theory of central banking has changed in the wake of the crisis, given the challenges posed by the exigencies of central banking practice. We then explore the implications of a different, Post Keynesian, understanding. While the logic of central banking is presented here as universal at one level, the particular historical, political, legal institutional and cultural context is critically important for its application (see Blinder *et al.*, 2017).

Manuscript received 31 July 2016; final version received 24 May 2017.
Address for correspondence: Sheila Dow, Division of Economics, University of Stirling, Stirling FK9 4LA, Scotland, UK; e-mail: s.c.dow@stir.ac.uk.
* University of Stirling and University of Victoria. This paper has benefited from comments from three anonymous referees, William Allen and from participants at the '40 years of the *Cambridge Journal of Economics*' Conference, Cambridge, July 2016, and at the Annual Conference of the Association for Heterodox Economics, Glasgow, July 2016.

[1] http://www.bankofengland.co.uk/about/Pages/onemission/default.aspx, accessed 14 May 2016.

Nevertheless, examples are provided in order to make the discussion more concrete, drawing primarily on the UK experience.

We start by revisiting the theory of central banking, particularly with respect to its purpose. As in all other areas of theory, how the subject matter is understood at an ontological level is shown to be critical to understanding differences within central banking theory. The mainstream practice of conceptual separation (monetary from real, economic from non-economic, monetary stability from financial stability, etc.) implies a closed-system ontology and encourages a methodological focus on formal modelling. In contrast, a non-mainstream ontology of complex interconnectedness within an evolving social system requires conceptual interconnectedness for its analysis, employing a political economy approach; we focus particularly on the Post Keynesian theory of central banking.

The third section is devoted to considering the various new developments in central banking practice over the last decade in relation to an unchanged prevailing theoretical approach. This is followed by a consideration of some of the current ideas for reform of money and banking which fall within a broad, political economy understanding of central banking, taking account of the evolution of structures and practices in the financial sector through which the central bank has its influence. Implications are drawn for the need for a new framework for central banking which recognises the interdependencies between the different goals for central bank policy and the methods of achieving them, based on a political economy approach.

2. Central banking theory and practice

The theory of central banking is unusual in the degree to which it has undergone a series of transformations over the years,[2] reflected in the changing goals and functions of central banks.[3] The transformation from the 1970s up to the recent crisis was particularly significant because of its methodological turn. Until then central banking theory could be classified as falling within political economy. It addressed the practice of central bank activity and the banks on which it operated, drawing on a range of sources and methods and considering a broad range of central banking functions. While there were different theoretical positions,[4] the content of theory evolved with practice, reflecting real economic developments and changes in power structures.

But the mathematical formalisation of mainstream economic theory in the post-war years facilitated developments in macroeconomic modelling as the basis for central banking, which were pursued at the expense of the less technical political economy approach. In the process, the dominant understanding of the role of the central bank changed, encouraging a narrow technocratic approach to practice. As will be detailed

[2] See e.g. Goodhart (2011), Singleton (2011), White (2013) and Dow (2015).

[3] Historically, central bank functions have included some or all of: bank regulation, monitoring and supervision of the banking system; managing the payments system; exchange rate management; debt management; lending to government as required, subject to maintaining the value of the currency; and at times promoting economic development through credit directives.

[4] These ranged from the Banking and Currency Schools in the nineteenth century (see Arnon, 2011; Goodhart and Jensen, 2015) to the Keynesian Radcliffe approach (Committee on the Working of the Monetary System, 1959) and free banking theory (see e.g. Hayek, 1978) in the twentieth century, depending on how banking and the economy were variously understood.

below, this development seriously reduced the capacity of central banks to address new challenges, most notably the crisis which became evident from 2007.

The macroeconomic modelling approach was privileged by policymakers in government, influencing the institutional framework for central banking and the rhetoric of central bankers. While practice was seen to require other methods ('arts'), this was not thought to be the concern of economic theorists who provided the principles for application (Colander, 1992). Within macroeconomic modelling in the 1990s, central bank activity came to be represented solely by an inflation target pursued by control of the official interest rate by an independent central bank (see e.g. Crowe and Meade, 2007; Cukierman, 2008).[5] Indeed monetary policy became synonymous with macroeconomic policy, whereby the 'good of the people' was understood in terms of GDP growth, to be served by a low and stable rate of inflation. Questions of financial stability were viewed as separable from monetary policy, but in any case lacking mainstream theoretical tools of analysis. Instead, banking theory focused more on the micro level, analysing market forces (possibly with constraints on competition or on full information), within an increasingly deregulated financial environment. (There was of course re-regulation, most notably in the form of capital adequacy requirements, but these were addressed more to controlling credit and thus inflation rather than to promoting financial stability.)

This 'new consensus' approach to the theory of central banking thus focused entirely on monetary stability (Arestis and Sawyer, 2008; see further Arestis and Sawyer, 2010). It reflected a change from Monetarist and then New Classical theory in its return to the traditional interest rate tool, given the failure of attempts at money supply control.[6] But the 'new consensus' approach shared with its predecessors a neutral-money (closed-system) ontology (Fontana, 2007). Within this approach, money is simply a technical input into exchange, financial markets are efficient, inflation is a monetary phenomenon and it is in the power of central banks to control it. Monetary stability was to be pursued to facilitate markets in generating financial and economic stability. The theory is imbued with conceptual separations.

The implementation of the 'new consensus' theory of monetary policy was reinforced by moves (albeit with a primarily political rationale) to introduce institutional separation. In the UK, for example, the Bank of England was made more independent of government in 1997, shedding the functions related to being the government's bank. The Bank's formal remit from the Chancellor in 1997 was first and foremost to continue to target inflation, and then to support government policies insofar as this did not jeopardise monetary stability.[7] Then in 1998 the conceptual separability of monetary stability and financial stability was also institutionalised. Bank monitoring and

[5] The unidirectional causal framework was expressed in terms of targets and instruments. According to the increasingly dominant rational expectations understanding, central banks could only have a short-term real impact by flipping the 'inflation surprise switch'. The resulting inflation bias appeared to provide the rationale for central bank independence, a line of reasoning challenged by Bibow (2004).

[6] While this implied acceptance that the money supply is endogenous, this was only in the fairly limited sense of changing the mechanism by which the central bank chooses a point on the money demand curve. Money supply endogeneity was explicitly acknowledged as a process by the Bank of England publication McLeay *et al.* (2014), but ultimately still judged to be subject to control via the official rate. There was also a new acknowledgement of (model) uncertainty, given evidence of the predictive inadequacies of large macro models (Dow, 2004).

[7] http://www.bankofengland.co.uk/monetarypolicy/Documents/pdf/chancellorletter970506.pdf, accessed 14 May 2016. The Chancellor's current remit to the Bank of England specifies that the monetary stability goal is encapsulated in an inflation target and is 'absolute' (http://www.bankofengland.co.uk/monetarypolicy/Documents/pdf/chancellorletter160316.pdf, accessed 14 May 2016). The Bank had in practice been following inflation targeting since 1992.

supervision at the micro level were divested to the new Financial Services Authority (FSA). This encouraged inattention to the banks on the part of the Bank of England and an erosion of expertise among Bank staff who had traditionally moved between departments during their careers. While a tripartite committee (involving the Bank, the FSA and the Treasury) was set up to address systemic financial stability issues, the actual resources devoted to such issues within the Bank had already been depleted after 1997 relative to resources devoted to monetary stability.[8] Reduced engagement with banks extended from cessation of the Bank's publication on loans to SMEs to an apparent lack of personal engagement between the Governor and bank CEOs (as reported by Darling, 2011). This period in the decade before the crisis which began in 2007 with the run on Northern Rock Bank was thus historically abnormal in the degree to which the scope of central banking was narrowed down (see for example Goodhart, 2011; Epstein, 2013; Cobham, 2012).

In contrast, the Post Keynesian approach, like other non-mainstream approaches, continues to develop central banking theory within the political economy tradition, whereby central banking functions extend beyond pursuit of monetary stability. The financial stability goal is particularly important because economies are understood to have the inherent potential for financial instability. Following Keynes, the role of the central bank is therefore seen as supporting government efforts to stabilise the economy by creating a stable, low-interest financial environment for investment planning, a view which prevailed in the UK until the 1960s. Interdependencies are emphasised, as highlighted by Radcliffe (Committee on the Working of the Monetary System, 1959, p. 17): 'it is … no longer appropriate to charge the monetary authorities with unambiguous tasks that can be sharply differentiated from other government action'. Monetary and financial stability are seen as interdependent with each other and with economic stability. Thus for example the financial instability which follows from credit cycles and cycles in liquidity preference exacerbates real economic instability and thus monetary instability. Further, the tools to address these goals themselves involve interdependencies. Monetary and fiscal policy are interdependent through the bond market. Also monetary policy can have a significant impact on financial stability. But the current framework for central banking does not address these interdependencies, constraining the scope for central bank policy.

The Post Keynesian rejection of a monetary theory of inflation, and more generally of a simple targets-instruments framework, follows from an open-system ontology whereby money is non-neutral at different levels. First, changes in money holdings arise endogenously as the counterpart to new debt undertaken to finance the purchase of goods and services; money is thus associated with (rather than causing) changes in output and employment both in the short run and in the long run. Money holdings also arise from new debt created to finance the purchase financial assets driven by expectations of asset price rises; money is thus also associated with rather than directly causing asset bubbles. Further, when the uncertainty which is endemic in an open social system is particularly high, the propensity to hoard money increases, constraining demand and tightening credit conditions. There is therefore no simple relationship

[8] Successive Annual Reports provide information on the share of costs attributed to monetary stability and financial stability. Resources for financial stability fell after 1997 relative to those devoted to monetary stability, only returning to pre-independence levels of just over one-half in the middle of the next decade.

between money and the price level; even *if* the money supply could be controlled, this could not ensure monetary stability. Thus, while monetary stability may arise, with monetary policy playing a part, it is not reasonable to task central banks primarily with targeting inflation.[9] Rather, economic and financial instability can be ameliorated by central bank operations on the level and variability of the long-term rate of interest, with its influence on investment, but also by bank regulation (see e.g. Kregel, 2014). This implies that economic and financial stability are the more appropriate primary goals of central bank policy, alongside government, from which monetary stability would follow.

Addressed to 'the good of the people', Post Keynesian central bank policy includes such factors as concern with the distribution of income and wealth, and concern with the trust in institutions which support money as a social relation. Stark increases in income and wealth inequality have raised awareness that central bank activities have real consequences not only at the aggregate level but also in distributional terms (Fontan *et al.*, 2016; see also Coibion *et al.*, 2012). It has long been understood that changes in interest rates and inflation redistribute between creditors and debtors. But further, since banks respond to monetary policy by changing the availability as well as the price of credit to particular classes of borrower (most notably between financial speculators and investors in real activity), there are distributional consequences. This proposition has been explored most fully in the regional finance literature, which shows national monetary policy having differing real effects on different regions (see e.g. Rodriguez Fuentes, 2006). Social justice issues arise even more clearly when considering the fiscal austerity policies introduced to address the fiscal cost of the banking crisis. It has therefore become clear to many that central banks need to take into account the government's goal of social stability.[10]

Money is also non-neutral in the more fundamental sense that society requires a safe asset, money, as the basis for contracts and transactions, and thus financial and economic development.[11] Far from just being a technical input to exchange, money is a social relation (Ingham, 2004), and its management by central banks is therefore inevitably a matter of social relations (Dow, 2013, 2015). Monetary stability thus involves stable social relations which may be disrupted by a crisis independently of what is happening to the price level: financial instability can therefore threaten the monetary system itself.

Central banks generally have a monopoly of legal tender denominated in the unit of account, but not of other assets expressed with reference to this unit which also act as a means of payment and a store of value. But there are varying degrees to which the value of these other assets may deviate from par valuation in terms of the unit of account, i.e. varying degrees of liquidity, creating a hierarchy of money assets (Bell, 2001).[12] This variation applies across the spectrum of financial assets but also over

[9] This argument applies whether the inflation target is formal or implicit in practice.

[10] While Bank of England Governor Carney (2014) explains how monetary and financial stability promotes social goals, referring to the redistributional effects of post-crisis monetary policy, the distributional effects of central bank actions extend beyond periods of instability.

[11] Money is also non-neutral at a third level of motivation, the love of money, which Keynes ([1930] 1973, p. 329) characterised as a 'somewhat disgusting morbidity'.

[12] Liquidity is the ease with which an asset can be exchanged for other assets, where 'ease' refers both to institutional arrangements and to perceived risk of capital loss; money is the most liquid asset. Assets have money attributes if they have a low elasticity of substitution with other liquid assets, low carrying costs relative to liquidity and a low elasticity of production (Keynes, [1936] 1973, ch. 17).

time: in the short run with financial instability and in the long run with financial innovation. Central banks have been critical in ensuring the stable value of the closest asset to cash: retail bank deposits. Sovereign debt has played a key role as (apparently) safe assets backing bank liabilities.

In outlining her stages-of-banking-development framework (based on English banking history), Chick (1993) detailed how central banking evolved to address the growing use of bank liabilities as money. When it took on the role of maintaining confidence in the convertibility of bank liabilities into cash at par, the Bank of England supported banks with the lender-of-last-resort facility while the banks went along with regulatory and supervisory restrictions.[13] But the resulting confidence in bank liabilities meant that the more lightly regulated non-bank financial intermediaries, which grew on the security of bank deposits as their reserves, were able to provide assets which were also liquid and thus potential money substitutes. This competitive threat for the banks was reduced by deregulation which eroded market segmentation between different types of financial institution, e.g. allowing retail banks to make mortgage loans. The ensuing era of liability management, which facilitated an explosion of credit, induced the Bank of England to re-regulate with ever-more-onerous capital adequacy requirements, something which has been promoted internationally by the Bank for International Settlements since the 1980s. These served to encourage even more innovation in securitisation and derivatives products, designed to avoid the need to raise more capital. Chick (2013) extends her analysis to the build-up to the latest crisis, discussing how the further development of these innovations added greatly to the conflagration, while central banks continued to keep their focus on inflation targeting.[14]

Over time, therefore, the range of assets with money attributes has expanded. Recently there has been considerable expansion in shadow banking (a market-based credit system), which has provided an alternative source of credit on a massive scale. This has generated liquidity in the form of its counterpart, shadow money (Mehrling, 2011). This phenomenon is not new (Mehrling *et al.*, 2013), but requires central banks' renewed attention to the need to provide liquidity to market-makers in the collateral backing shadow money, indeed to act as market-maker-of-last-resort (Carney, 2013).

Gabor and Vestergaard's (2016) analysis of shadow money illustrates how financial instability can threaten the functioning of the monetary system itself. They focus on repos (repurchase agreements with marketable collateral) as the most liquid asset outside the net of central bank regulation and support.[15] The increased recourse of retail banks to wholesale market funding (relative to deposits) was a notable factor in the crisis, raising the issue of risks associated with their liabilities as well as their assets. The valuation of collateral is a general determinant of degree of liquidity of assets. Confidence in repos (and thus their liquidity) is directly and explicitly tied to their collateral on a mark-to-market basis. A collapse in valuation of repo collateral has an

[13] See Goodhart and Illing (2002) for a range of accounts and analyses of the lender-of-last-resort facility.
[14] See Kindleberger and Aliber (2005) for further historical evidence of the destabilising effects of financial innovation.
[15] Since collateral often takes the form of sovereign debt, it is significant that this debt is no longer assumed to be risk-free.

immediate effect on availability of liquidity and the moneyness of shadow money, and thus the capacity of the system to create credit.[16]

3. Central banking after the crisis

From a Post Keynesian perspective, the crisis was a consequence of central banks putting an undue focus on pursuing monetary stability at the expense of financial stability, supported by theory which denied the relevance of the latter, and by the inattention to bank (and central bank) governance issues. At the theoretical level, the crisis exposed the weakness in basing central bank practice on monetary stability addressed through mathematical modelling. When the crisis hit, central banks had no choice but to accept the interdependencies and complexities belied by the modelling approach.

Those central banks focusing on targeting inflation at the expense of attention to financial stability were ill equipped to deal with the crisis. The new consensus view was so well entrenched that the initial reaction to the possibility of bank failure was to refuse support on the grounds that this would reinforce moral hazard. Indeed, two months before the Northern Rock crisis, the then Governor of the Bank of England had pondered how central banks should respond to the growing market turmoil which had (apparently) resulted from various market imperfections (King, 2007). He re-emphasised the inflation target and warned that protecting banks from the consequences of the excessive risks they had undertaken would simply encourage such behaviour in the future: a moral hazard problem.

But the systemic nature of the problem became apparent very quickly, reflecting the complex interdependencies within the financial sector, and between the private sector, central banks and government. The authorities were faced with the prospect of financial (and economic) system collapse if they did not respond in a way which acknowledged these interdependencies. Central bank policy shifted towards liquidity support for the banking system as a whole, i.e. the pursuit of financial stability. Yet those central banks under inflation targeting regimes were still formally required to prioritise monetary stability.[17] This was all the more significant because macroeconomic policy after the crisis continued to rely heavily on monetary policy; after the initial fiscal stimulus to ward off recession, fiscal policy was generally in retrenchment. The new consensus understanding of 'the good of the people' in terms of GDP growth persisted, served by monetary stability which was to be achieved by reducing information asymmetry and by altering incentives and constraints.

Just like the underlying theoretical understanding, the monetary policy tools available to central banks remained essentially as before—although adapted to new circumstances and presented as being novel. The primary tool is ***the setting of the official interest rate*** (normally the repo rate) as a lever to manipulate the spectrum of market rates. Along with liquidity support for the banking system went falls in official rates, which remained at historically low levels. This policy was rationalised by low inflationary expectations because of continuing weakness of economic conditions, still

[16] How this feeds into the banking system during a crisis depends on regulation and financial structure (Gabor and Vestergaard, 2016).

[17] This is evident from the Minutes of policymaking bodies like the UK Monetary Policy Committee. Indeed, the current remit to the Bank of England specifies that the inflation target is 'absolute' (http://www.bankofengland.co.uk/monetarypolicy/Documents/pdf/chancellorletter160316.pdf, accessed 14 May 2016).

expressed in terms of inflation targeting. Many analysts perceived a market imperfection in the form of the 'zero lower bound'[18] which would prevent rates falling to a negative equilibrium level (see e.g. Blinder, 2000). Yet some central banks (Denmark, Sweden, Switzerland, Japan and the ECB) reduced official rates below zero because of fears of deflation. But negative rates were applied only to a class of bank reserves; banks did not pass on this cost to retail depositors in the form of negative deposit rates, but rather have responded by curtailing portfolio growth and/or acquiring riskier (higher-expected-return) assets, threatening economic and financial stability. Applying a carrying cost to bank deposits themselves would make them less acceptable as money and drive depositors elsewhere in the search for alternative money assets. Indeed, this was one of Keynes' ([1936] 1973, pp. 353–8) arguments against Gesell's (1916) proposal of negative interest rates as a permanent measure to discourage hoarding. Arguably negative interest rates on deposits would not have this effect at the height of a crisis when the availability of alternative money assets is more restricted. But at the same time negative interest rates might add fuel to any tendency for bank runs.

Continued concern that there was effectively a zero lower bound to interest rates encouraged recourse to a second tool of monetary policy: ***open market operations in government debt***. Where central banks are independent, these operations cannot be directly with government but rather with the secondary market, but these have been used on a massive scale, under the rubric of 'quantitative easing'. The aim has been to inject liquidity into the banking system, to encourage lending to the non-bank sector. An innovation in some cases has been to extend open market operations to corporate debt in an effort to encourage more investment by further influencing the yield curve, risk spreads and bank credit availability. Within EMU a traditional open market operations strategy is challenged by the national character of government debt, where national fiscal positions can differ markedly. Indeed, quantitative easing there has been focused more on collateralised loans to banks (see further Bibow, 2015). But the shortage of good collateral, particularly sovereign debt, combined with heavy-handed liquidity regulation, has compounded banks' liquidity problems (Gabor, 2014).

Consistent with Post Keynesian theory, there has been little correlation between this massive increase in base money and the rate of retail price inflation. Of greater concern is the potential for financial instability from credit-fuelled asset price inflation and for economic instability from the low correlation between bank reserves and new credit (as bank liquidity preference remains high).

The third tool of monetary policy which had become increasingly important even before the crisis is ***central bank communications***, or 'signalling', designed to influence expectations (see e.g. Geraats, 2002)—an exercise in making the world more like the world of the rational expectations hypothesis. Enhanced central bank communications in fact play their part in the endogeneity of monetary policy; not only is monetary policy conditioned on current expectations about monetary policy, but central banks now try to manage these expectations. While managing expectations is consistent with a Keynesian approach to monetary policy under uncertainty, it is justified in mainstream theory instead as increasing transparency, reducing information asymmetry.

[18] The zero lower bound is seen as a logistical floor to nominal rates. A liquidity trap, with which it is often confused, can occur at any rate whenever there is an overwhelming expectation that the rate will not be reduced.

The crisis made clear the scope for expectations to exacerbate financial instability. Further, the broadening of the functions of central banks necessitated by the crisis needed to be presented in such a way as to enhance their effectiveness. In the UK, the Governor of the Bank of England emphasised the role of expectations, enshrining communications in the function of 'forward guidance' (MPC, 2013). At the same time, he has widened the remit for central bank communications to such matters as the effects of climate change and constitutional change, indicating the extent to which it is now more widely accepted that central bank concerns and activities (including communications) are relevant for a wider range of economic and social issues; but these concerns are still all addressed with respect to the maintenance of monetary stability. Nevertheless, the Bank's Chief Economist, Haldane (2017), advocates directing central bank communications to rebuilding trust in central banks.

In the meantime, central banks had already been imposing increasingly stringent ***capital requirements*** on banks and other financial institutions from the 1980s in order to curb credit expansion. The crisis drew attention to the need for bank capital as a prudential measure to support banks in times of asset price collapse (Admati and Hellwig, 2013). But it is not clear that the further strengthening of capital requirements should be a priority. Their effectiveness is limited in a variety of technical ways: lagged accounting information, the difficulty in valuing assets, etc. (see e.g. Blundell-Wignall *et al.*, 2014). But there is also the incentive to innovate to avoid raising capital; it must not be forgotten that it was banks' efforts to evade capital requirements from the 1980s on which fuelled the latest crisis. Further, the need for banks to raise capital works against efforts through quantitative easing to encourage increased bank lending to business. Finally, financial stability is threatened by the application of the same capital requirements to banks with different business models, disadvantaging those with more conservative models, such as cooperative banks, i.e. those most supportive of financial stability.[19]

The motivation for these capital requirements is to make banks more resilient in the face of recurrence of crisis (even though inadequate capital had not been a trigger of the recent crisis). The emphasis is on protecting the public purse from the need for bailouts, i.e. on significantly diminishing, if not eliminating, the central bank's role as lender of last resort. Yet capital can never be enough to protect banks in a systemic crisis without a lender-of-last-resort facility; indeed, such a facility can prevent crises by raising confidence that asset fire sales will be averted. It is liquidity rather than capital which is key in preventing a crisis emerging in the first place.

But an increasing emphasis is being placed on utilising the price mechanism to prevent crises. This is most evident in the policy that ***failed banks should be bailed in*** rather than bailed out, i.e. that the risk of failure should be priced in to their liabilities. If this were applied to retail deposits, they would no longer have the required characteristics of money (as a safe asset), driving depositors to alternative assets which were now more money-like. As far as other liabilities are concerned, there is a push for bank funding through contingent convertible ('coco') bonds which would in times of crisis convert debt into equity, reflecting the mainstream view that equity markets are

[19] Similarly, while enhanced liquidity requirements may seem to ensure more prudent bank behaviour, Allen (2015) points to their unintended consequences (increasing banks' demand for sovereign debt) as impeding the recovery of the financial system.

efficient while debt imposes constraints on market forces. Yet Avgouleas and Goodhart (2014) point out the inability of bailing in to address asset price collapse in a systemic crisis—indeed, bailing in would exacerbate the crisis. It has been a continuing refrain among critiques of mainstream analysis of the financial sector that bank failures should not be analysed as isolated incidents, given their tendency to occur in systemic fashion.

But while mainstream macroeconomic theory persists in regarding systemic risk as an aberration within its implicit ontology, central banks could not afford to do so. Indeed, Blinder *et al.* (2017) find widespread acknowledgement among central bankers of the need to add pursuit of financial stability to their mandate. ***Institutional changes in the pursuit of financial stability***, such as the establishment of the international Financial Stability Board and the reorganisation of national central banks, reflect central banks' change in focus. In the UK, the framework has been radically changed (Murphy and Senior, 2013). Now macroprudential policies, with capital requirements at their centre, are designed and implemented by the Financial Policy Committee (FPC) of the Bank of England, which addresses systemic risk issues and coordinates with the Monetary Policy Committee (MPC). The FPC in turn draws on the Prudential Regulation Authority (PRA).[20] Because the PRA conducts microprudential supervision of the entire financial sector, it can address the consequences of developments (including new regulation) in one segment of the sector for other segments, increasing the scope for identifying and addressing sources of instability. This institutional change also cements the recognition of the interdependence between monetary stability and financial stability, and between macroprudential and microprudential regulation. The resources devoted by the Bank to the financial stability goal are now on a par with those for the monetary stability goal.

A major motivation for the introduction of macroprudential policies, as well as the willingness to contemplate bank failure, has been to limit the need for large-scale bailouts of the type used to resolve the 2008 crisis. The fiscal consequences were such as to cause governments to reverse the initial fiscal stimulus and introduce draconian fiscal austerity measures designed (often unsuccessfully) to repair government finances. The rationale was that sovereign debt was being devalued by financial markets as governments' fiscal positions worsened. This compounded the weakness of other asset values, eroding the safety of sovereign debt as bank reserves. The system came to lack good collateral (Gabor, 2014; Dow, 2014; Allen, 2015). While the traditional policy tool for stemming systemic bank failure was to supply liquidity to the market, in the extreme through the lender-of-last-resort function, the scale of the 2008 crisis was such that this solution has now been deemed unacceptable for future crises.

But the scale of the bailout was due to increased institutional scale as retail banking became absorbed within large universal banks, notably including investment banking, following the deregulation which started in the 1970s and the form of subsequent re-regulation (Chick, 2013). But this development also fed into a much enhanced interconnectedness within the financial sector and the growth in capital markets relative to traditional banking. The most obvious incidence of this interconnectedness arose from investment on a global scale in opaque structured products whose value depended ultimately on low-grade US mortgages. But this was just the tip of an iceberg

[20] The new independent Financial Conduct Authority attends to financial institutions' conduct in customer relations.

of interconnectedness within which shadow banking has become a major factor. The result was a systemic crisis on a global scale threatening the survival of massive banking institutions. Much thought has therefore gone into measures to reduce that interconnectedness. In the UK the Vickers Commission proposed the ***ring-fencing of retail banking*** (albeit still with illiquid mortgage assets) within banking organisations, subjecting it to stricter reserve and capital requirements (Independent Commission on Banking, 2011).

Nevertheless, the expectation is that regulation and market forces would be sufficient to prevent the need for bailout. The requirement on banks to prepare living wills would address any exceptional cases of failure. Implementing regulatory restrictions is inevitably complex and vulnerable to evasion through innovation by financial firms. But this is an argument for hands-on engagement by policymakers with those they are regulating in order to make regulations as effective as possible, and dynamic in the face of changes in practices. From a Post Keynesian perspective, this relationship with retail banks would be all the more effective if the traditional *quid pro quo* were restored of balancing regulatory restrictions with provision of the lender-of-last-resort facility. Rather than downplaying this facility, restoring it to prominence would serve to restore trust in banks (and central banks) and money, reducing the risk of crisis and thus of the need for the facility to be used.

Thus, while central banks responded to the crisis by extending the use of traditional monetary policy tools, they did so with an increasing market orientation which ignores the complex interdependencies involved at the social, institutional and technical levels. Only the attempts to reintroduce some segmentation in banking represent a recognition of the special nature of retail banks in the provision of money and credit, but even there the emphasis has been on limiting the need for central bank support rather than on the rebuilding of trust in institutions. In the meantime the implications of quantitative easing for government finances and the implications of these finances for the relative safety of sovereign debt as collateral, together with the undue burden placed on monetary policy by continuing fiscal austerity, all await resolution.

Consideration of banking structure is relevant to the role of central banks since that structure is central to the conduct and effects of monetary and prudential policies in relation to broader government policy. In the following section, we therefore consider ideas for reform of money and banking alongside other ideas closer to what is more conventionally regarded as the business of central banks.

4. Some ideas for reform of central banking

Some of the more radical structural proposals have arisen within the 'new consensus' framework in the sense of understanding 'the good of the people' in terms of GDP growth and of understanding the achievement of monetary and financial stability in terms of conceptual separations, notably between the monetary and the real and between the public and private sectors, and continuing with reliance on market forces to ensure financial stability.

Several proposals address the nature of the money asset itself, drawing on old proposals for monetary reform. At one end of the spectrum, free bankers propose that central banks cease to exist, such that all money is provided by the private banking system (drawing e.g. on Hayek, 1978; see also Dowd, 2009). Without central bank

intervention (with associated fiscal costs), it is anticipated that depositors themselves would discipline banks to be prudent in their asset allocations; imprudent investment behaviour would threaten the value of deposit liabilities and, left uncorrected, would lead to bank failure.[21] But the free banking proposal fails to meet the basic requirement that the banking system provide a stable money asset; bank liabilities in this system would vary in value in line with the bank's assets (Dow, 1996). The same argument applies to modern proposals for limited purpose banking, whereby all assets including money would take the form of mutual funds (Kotlikoff, 2010). But in fact the experience of the crisis which began in 2007 was so unnerving that confidence in the banking system to operate successfully without any central bank direction at all has been seriously challenged. Indeed, historical experience tells us that a successful private sector banking system will in any case develop its own central banking system (Dow and Smithin, 1992).

Much more attention has been given recently to proposals for the other end of the spectrum whereby central banks would be given complete control over the supply of money and the government would not be required to bail out banks.[22] Some proposals, like that for narrow banking, are restricted to the central bank setting the money supply while eliminating fractional reserve banking by requiring 100% reserves (full reserve banking).[23] But history has shown it to be impossible for the state to operate an effective monopoly on what is *treated as* money, even when taxes can only be paid in state money. But in any case, by focusing on money supply control, these proposals ascribe a causal role for money (held only for transactions purposes) with respect to inflation, consistent with 'new consensus' thinking. But if demand for money (in its various forms) is unstable due to shifts in liquidity preference, controlling the supply of money (even if it were logistically feasible) would not control inflation.

Some full reserve banking proposals, while subject to the same critique, differ in crucial respects from the 'new consensus' approach, extending the reach beyond GDP growth to issues of social welfare and income distribution. They envisage money entering and leaving the system by means of government expenditure and taxation, i.e. a very explicit link between fiscal and monetary policy (Jackson and Dyson, 2012; Benes and Kumhof, 2013). This echoes the 1930s Chicago and Social Credit proposals; the mechanism by which Douglas's ([1924] 1933) government money would enter the economy, e.g., was a 'social dividend' paid to all citizens, an idea being revived now in the form of basic income proposals. Most full reserve banking proposals envisage *all* money being a counterpart to fiscal policy, i.e. money effectively corresponding to M_0, compounding the challenge of deciding on the amount of new money to be set.[24]

But there is no reason why monetary financing of government expenditure more generally should be tied to a central bank monopoly on money, quite apart from the conflict with what is feasible in practice. A range of different alternatives to the current form of quantitative easing have been put forward, all designed to boost aggregate demand more directly (see van Lerven, 2016). Proposals for 'people's quantitative

[21] A variant of this proposal is to return to the gold standard, whereby the market monetary system would be anchored by the requirement for convertibility into gold.

[22] A representative range of these proposals is reviewed by van Dixhoorn (2013), Dow *et al.* (2015), Kroll (2015) and Laina (2015).

[23] See Fontana and Sawyer (2016) for a detailed critique of full reserve banking.

[24] However, see Dyson *et al.* (2015).

easing', or directing new money to green projects, or infrastructure projects more generally, would be a mechanism for injecting new liquidity into the economy in a way which supported government policy. In contrast, proposals for 'helicopter money' envisage central banks injecting new money into the economy more generally to boost demand, but not necessarily associated with social goals.[25]

From a Post Keynesian perspective, these proposals suffer from conflict between the conceptual separations typical of the 'new consensus' approach and the reality of interdependencies. Starting from a critique of the full-reserve-banking form of state control of money, Kroll (2015) proposes instead a Partial Sovereign Money system whereby the central bank stimulates an underemployed economy by means of direct injections of new money to finance expenditure rather than transactions in securities, while commercial banks can continue to operate in a fractional reserve system which is heavily constrained by regulation. As with Kroll's proposal, a Post Keynesian approach regards an institutional arrangement like fractional reserve banking as an effective mechanism for financing investment in advance of saving, to promote economic development, rather than a danger to be eliminated. If the seeds of the latest crisis were sown by market and institutional diffusion in banking and doubts about central bank support, the prevention of future crises requires a return to the mutual arrangement between retail banks and central banks whereby the former accept portfolio restrictions in return for the ability to expand portfolios with central bank support. Of course the financial sector has moved on in other ways too, in particular in its capacity for sophisticated evasion of regulatory restrictions. But that is no reason to give up on restrictions—rather, to keep updating them and extending their scope in light of financial innovations. Thus, e.g., further development of macroprudential controls addressed to bank lending practices, such as maximum loan-to-value ratios and debt-to-income ratios, could go a long way to preventing recurrence of crisis at the household level. For the financial system as a whole, financial transactions taxation would take some of the heat out of credit creation to finance speculative financial transactions and divert credit creation to real economic activity.

The Vickers proposals and the efforts to bring financial stability oversight back more firmly into the Bank of England are welcome moves in that direction. Further, since reliance on macroprudential policy alone carries the risk of officials lacking the knowledge necessary to revise policy in light of developments, the fact that microprudential regulation (by the FPA) is back within the Bank is very welcome. There is attention now to the warning signs of systemic risk. Bank portfolios are now being monitored periodically by means of stress tests which have some chance of picking up systemic tendencies. These tests reinstate in a more formal way the regular monitoring of individual banks which had been a staple function of central banks before the 'new consensus' period. But while this is welcome, the output is what we might call 'information' (extrapolation from quantitative evidence), and information which is arguably incomplete or, worse, perverse (see e.g. Dowd, 2015). In order to pick up warning signs more fully, these tests need to be supplemented by the broader 'knowledge' and understanding to be gleaned from close contact with bank operations and innovations

[25] Friedman (1969) introduced the concept as a fictional representation of an exogenous increase in the money supply (rather than acceding to the endogenous money argument that most new money enters the economy alongside credit-financed spending decisions).

which strengthens the capacity to address an uncertain future. Coordination between macroprudential regulators and microprudential regulators is thus crucial.

Such knowledge is also crucial for the ability of central banks to keep up with the evolving products, practices and environment of retail banking; a return to the principles of traditional retail banking allows for the possibility that its appropriate form would evolve, e.g. allowing for engagement with derivatives for hedging rather than speculative purposes. But there has been an undue emphasis on bank failure which reflects a continuing market orientation among central banks as well as mainstream theory. The mind-set has been to anticipate bank failure in the future and indeed, for some, to welcome it as a sign that market discipline is working to counteract moral hazard (King, 2009). This runs counter to the core principle which has guided Post Keynesian analysis of money and banking, which is that society needs money, this money is provided mainly by banks and the duty of the central bank is to ensure that that money is sound, i.e. that the expectation is that banks do not fail. While some bank failures might occur in isolated instances, requiring careful management, these should be exceptional, in contrast to the prevailing mainstream discourse which focuses on bank failure as a routine exercise in market discipline.

Central banks need to engage directly with the banks whose liabilities are money. Not only does such engagement keep the central bank apprised of new products and practices, and new sources of systemic risk, but it would also allow it to engage more effectively on matters of bank culture. Much has been made, in analyses of the crisis, of the encroachment of an inappropriate investment banking culture into retail banking. Bank culture is highly complex, embedded in particular environments, so restoring an appropriate culture is not an easy matter. But efforts can be made in that direction within the monitoring and supervision functions; it is a great pity that the UK government did not use the opportunity of public ownership of failed banks to establish exemplars of good culture for the rest of the banking system.[26]

Finally, there are further proposals for changing the structure of banking motivated by the need for credit to be directed in particular ways in order to serve the government's socio-economic goals (e.g. New Economics Foundation, 2016). Market-driven credit allocation is inefficient with respect to economic performance, given that it is governed by the distorted knowledge base of a concentrated commercial banking system (objective quantitative risk measures not being available, given uncertainty). But for the state, efficiency is relative to goals which extend beyond economic performance. Thus policy can reasonably be directed to encourage private sector banks to promote social justice, e.g., even if it damages short-term profitability. There would, e.g., be scope for a return to credit directives to steer bank lending towards particular sectors or regions, or in such a way as to offset the redistributional effects of the current system. Inevitably there would be some unintended consequences, but that is the case with all government intervention and is not *per se* a reason to abandon it. In addition, public sector initiatives can aim to direct credit in pursuit of public goals, such as the Green Investment Bank set up in the UK in 2012, and financial help for small businesses.

Further support could be given to those institutions already pursuing social goals. Since banks with a stakeholder business model were less vulnerable during the crisis,

[26] Progress is being made on some fronts, e.g. on CEO pay; Carney (2014) notes efforts to change bank culture.

such a policy would also contribute to financial stability. The UK is unusual (relative e.g. to Germany, France, Spain, the Netherlands and Austria) in the dominance of banking by commercial banks, compared to co-operative financial institutions, and in the absence of public savings institutions. The Bank of England could take a lead in examining the scope for supporting and fostering the growth of cooperative institutions, such as credit unions and not-for-profit local savings banks. The regional finance literature supports the idea that local banks have a comparative advantage in assessing loan applications, but face liquidity challenges relative to national banks (see e.g. Chick *et al.*, 2013). Thus Bone (2016), e.g., advocates (for Scotland) the establishment of not-for-profit People's Banks within a People's Banking Network; these would be supported by a National Investment Bank which would help fund infrastructure projects more generally.

The final issue to address is central bank independence designed to separate monetary policy from fiscal policy, an arrangement promoted by the 'new consensus' approach. The interpretation of evidence on the effects on inflation of central bank independence is still a matter for debate, the relationship being sensitive to definitions of independence and the sample from which evidence is drawn (see e.g. Alesina and Stella, 2010; Masciandaro and Romelli, 2015; Garriga, In press). But in any case, because of the crisis, central banks perforce had to engage actively in government debt markets and to coordinate with governments. Monetary policy ostensibly was still addressed to the inflation target but in fact was addressed to economic and financial stability. The interconnectedness of monetary stability and financial stability with fiscal policy and other government goals, e.g. with respect to social inclusion or sustainable development, could no longer be ignored.

Looking forward, this interconnectedness needs to be recognised more formally so that an inflation target is no longer, as the Chancellor put it in March 2016, 'absolute' (as if it were separable, and even attainable). Indeed, the broader (even if sometimes conflicting) goals of central banks should no longer be treated as subsidiary, but brought into clearer focus. Just as central banks and commercial banks need to recover a more explicitly cooperative relationship with each other, so do central banks and governments. There are many possible (institutional and procedural) forms of central bank independence, including a central bank mandate which set out areas for cooperation with government, a joint-committee structure to manage that cooperation and an appropriate set of incentives for central bankers (see further Bibow, 2004). It would thus still be possible for central banks to have some degree of independence which would still address in a constructive way the interdependencies between the goals and policy tools of government and central bank. But it does need a new framework.

5. The need for a new framework for central banking

We have addressed the question of how central banking should now develop by going back to the principle that central banks should ensure that a safe money asset is provided. Rather than interpreting this principle in terms of a monetary theory of inflation over which the central bank has oversight, the Post Keynesian perspective interprets it as the core element of a stable financial system which generates credit to finance real economic activity in such a way as to support government policies with respect to its socio-economic goals (such as reducing income inequality and conserving natural resources).

Central bank support for retail bank deposits (as next to cash in the hierarchy of money assets) is crucial, as a *quid pro quo* for regulation to ensure a prudent bank asset structure. It is very difficult to enforce constraints on bank profit-seeking, given the capacity of the banks to innovate. Yet the analysis here suggests that the alternative of central banks wresting all power over creating money from the banks is not the answer. In particular, shadow banking has demonstrated the capacity for the financial system to develop its own credit mechanisms and money assets. But shadow money only meets the requirements of money assets when the associated collateral's value is stable; it loses the attributes of money when collateral value collapses. The fractional reserve banking system rather can be harnessed by ensuring its viability, returning to a separation between retail banking from investment banking, with macroprudential regulation, close supervisions at the bank level and a guarantee of central bank support for retail banking. Financial innovation inevitably requires central banks to be sensitive to the evolution of retail banking. It also requires central banks to oversee the asset structures of an ever-widening range of types of institution developing new products and practices, and to supply the financial system more widely with adequate liquidity.

At the same time the pretence of independence between fiscal and monetary policy needs to be dropped and a more sensible mechanism restored for monetary financing of deficits when required. Too much responsibility has been placed on central banks for macroeconomic policy when in fact fiscal policy is the more appropriate way of dealing with recession—supported by the central bank. But central banks can also support government's industrial, environmental, regional and general redistributional policies through their influence over bank behaviour. It can also join with government in changing the structure of banking, e.g. using a more tailored set of regulations, possibly supplemented by subsidies, to support a layer of local and cooperative banking—and indeed to engage in banking itself.

None of this is at all easy; central banking inevitably involves handling tensions with and within the private sector as well as cooperating with it. But what the last few decades demonstrate is the importance of having a strong political will to counter the vested interests in finance. Governments need the courage to acknowledge the interdependence of the role of central banks with their own goals and policies and to embrace it in order to promote 'the good of the people … by maintaining monetary and financial stability'. We need a new framework for central banking for the twenty-first century.

Bibliography

Admati, A. and Hellwig, M. 2013. *The Bankers' New Clothes: What's Wrong with Banking and What to Do about It*, Princeton, NJ, Princeton University Press

Alesina, A. F. and Stella, A. 2010. *'The Politics of Monetary Policy'*, NBER Working Paper no. 15856

Allen, W. A. 2015. Asset choice in British central banking history, the myth of the safe asset, and bank regulation, *Journal of Banking and Financial Economics*, vol. 2, no. 4, 5–18

Arestis, P. and Sawyer, M. 2008. A critical reconsideration of the foundations of monetary policy in the new consensus macroeconomics framework, *Cambridge Journal of Economics*, vol. 32, no. 5, 761–79

Arestis, P. and Sawyer, M. 2010. What monetary policy after the crisis?, *Review of Political Economy*, vol. 22, no. 4, 499–515

Arnon, A. 2011. *Monetary Theory and Policy from Hume and Smith to Wicksell: Money, Credit, and the Economy*, Cambridge, Cambridge University Press

Avgouleas, E. and Goodhart, C. A. E. 2014. *'A Critical Evaluation of Bail-In as a Bank Recapitalisation Mechanism'*, CEPR Discussion Paper no. 10065, July
Bell, S. 2001. The role of the state and the hierarchy of money, *Cambridge Journal of Economics*, vol. 25, no. 2, 149–63
Benes, J. and Kumhof, M. 2013. *'The Chicago Plan Revisited'*, IMF Working Paper WP/12/202
Bibow, J. 2004. Reflections on the current fashion for central bank independence, *Cambridge Journal of Economics*, vol. 28, 549–76
Bibow, J. 2015. *'The Euro's Savior? Assessing the ECB's Crisis Management Performance and Potential for Crisis Resolution'*, Levy Institute Working Paper no. 845
Blinder, A. S. 2000. Monetary policy at the zero lower bound: balancing the risks, *Journal of Money, Credit and Banking*, vol. 32, no. 4, part 2, Monetary policy in a low-inflation environment, 1093–99
Blinder, A., Ehrmann, M., de Haan, J. and Jansen, D.-J. 2017. *'Necessity as the Mother of Invention: Monetary Policy after the Crisis'*, ECB Working Paper no. 2047
Blundell-Wignall, A., Atkinson, P. and Roulet, C. 2014. Complexity, interconnectedness: business models and the Basel system, pp. 51–74 in Goodhart, C., Gabor, D., Ertürk, I. and Vestergaard, J. (eds.), *Central Banking at a Crossroads: Europe and Beyond*, London, New York and Delhi, Anthem Press
Bone, E. 2016. *'Banking for the Common Good*. London: New Economics Foundation, Friends of the Earth Scotland, Move Your Money and Common Weal', Discussion Paper, 10 March
Carney, M. 2013. The UK at the heart of a renewed globalization, 24 October http://www.bankofengland.co.uk/publications/Documents/speeches/2013/speech690.pdf, accessed 31 July 2016
Carney, M. 2014. *'Inclusive Capitalism: Creating a Sense of the Systemic'*, paper presented at the Conference on Inclusive Capitalism, London, 27 May
Chick, V. 1993. The evolution of the banking system and the theory of monetary policy, pp. 79–92 in Frowen, S. F. (ed.), *Monetary Theory and Monetary Policy: New Tracks for the 1990s*, London, Macmillan
Chick, V. 2013. The current banking crisis in the UK: an evolutionary view, pp. 148–61 in Harcourt, G. and Pixley, J. (eds.), *Financial Crises and the Nature of Capitalist Money: Mutual Developments from the Work of Geoffrey Ingham*, London, Palgrave Macmillan
Chick, V., Dow, S. C. and Rodriguez-Fuentes, C. 2013. Good banks and bad banks, centralised banks and local banks and economic growth, *Ekonomiaz*, vol. 84, no. 3, 110–27
Cobham, D. 2012. The past, present and future of central banking, *Oxford Review of Economic Policy*, vol. 28, no. 4, 729–49
Coibion, O., Gorodnichenko, Y., Kueng, L. and Silvia, J. 2012. *'Innocent Bystanders? Monetary Policy and Inequality in the U.S.'*, NBER Working Paper no. 18170
Colander, D. 1992. The lost art of economics, *Journal of Economic Perspectives*, vol. 6, no. 3, 191–98
Committee on the Working of the Monetary System. 1959. *Report ('Radcliffe Report')*, London, HMSO, Cmnd. 827
Crowe, C. and Meade, E. E. 2007. The evolution of central bank governance around the world, *Journal of Economic Perspectives*, vol. 21, no. 4, 69–90
Cukierman, A. 2008. Central bank independence and monetary policymaking institutions—past, present and future, *European Journal of Political Economy*, vol. 24, no. 4, 722–36
Darling, A. 2011. *Back from the Brink: 1,000 Days at Number 11*, London, Atlantic Books
Douglas, C. H. [1924] 1933. *Social Credit*, 3rd ed., London, Eyre and Spottiswoode
Dow, S. C. 1996. Why the banking system should be regulated, *Economic Journal*, vol. 104, no. 436, 698–707
Dow, S. C. 2004. Uncertainty and monetary policy, *Oxford Economic Papers*, vol. 56, 539–61
Dow, S. C. 2013. The real (social?) experience of monetary policy, pp. 178–95 in Pixley, J. and Harcourt, G. C. (eds.), *Financial Crises and the Nature of Capitalist Money: Mutual Developments from the Work of Geoffrey Ingham*, London, Palgrave Macmillan
Dow, S. C. 2014. The relationship between central banks and governments: what are central banks for?, pp. 229–43 in Goodhart, C., Gabor, D., Ertürk, I. and Vestergaard, J. (eds.), *Central Banking at a Crossroads: Europe and Beyond*, London, New York and Delhi, Anthem Press

Dow, S. C. 2015. Monetary policy, pp. 533–47 in Davis, J. B. and Dolfsma, W. (eds.), *The Elgar Companion to Socio-Economics* (2nd ed.), Cheltenham, Edward Elgar
Dow, S. C., Johnsen, G. and Montagnoli, A. 2015. *'A Critique of Full-Reserve Banking'*, University of Sheffield Department of Economics Working Paper, March
Dow, S. C. and Smithin, J. 1992. Free banking in Scotland, 1695–1845, *Scottish Journal of Political Economy*, vol. 39, no. 4, 374–90
Dowd, K. 2009. Moral hazard and the financial crisis, *Cato Journal*, vol. 29, no. 1, 142–66
Dowd, K. 2015. *No Stress: The Flaws in the Bank of England's Stress Testing Programme*, London, Adam Smith Institute
Dyson, B., Hodgson, G. and Jackson, A. 2015. *Would a Sovereign Money System Be Flexible Enough?*, London, Positive Money
Epstein, G. 2013. Developmental central banking: winning the future by updating a page from the past, *Review of Keynesian Economics*, vol. 1, no. 3, 273–87
Fontan, C., Claveau, F. and Dietsch, P. 2016. Central banking and inequalities: taking off the blinders, *Politics, Philosophy & Economics*, vol. 15, no. 4, 319–57
Fontana, G. 2007. Why money matters: Wicksell, Keynes, and the new consensus view on monetary policy, *Journal of Post Keynesian Economics*, vol. 30, no. 1, 43–60
Fontana, G. and Sawyer, M. 2016. Full reserve banking: more 'cranks' than 'brave heretics', *Cambridge Journal of Economics*, vol. 40, no. 5, 1333–50
Friedman, M. 1969. The optimum quantity of money, ch. 1 in *The Optimum Quantity of Money and Other Essays*, Chicago, Adline Publishing
Gabor, D. 2014. The ECB and the political economy of collateral, pp. 157–76 in Goodhart, C., Gabor, D., Ertürk, I. and Vestergaard, J. (eds.), *Central Banking at a Crossroads: Europe and Beyond*, London, New York and Delhi, Anthem Press
Gabor, D. and Vestergaard, J. 2016. *'Towards a Theory of Shadow Money'*, UWE and DIIS mimeo, https://ineteconomics.org/uploads/papers/Towards_Theory_Shadow_Money_GV_INET.pdf
Garriga, A. C. 2016. *'Central bank independence in the world: a new dataset'*, *International Interactions, vol. 42, no. 5, 849–68.* Geraats, P. M. 2002. Central bank transparency, *Economic Journal*, vol. 112, F532–F565
Gesell, S. 1916. *Die natürliche Wirtschaftsordnung durch Freiland und Freigeld*, Les Hauts Geneveys, Selbstverlag, published in English as *The Natural Economic Order* (trans. P. Pye), 1929
Goodhart, C. A. E. 2011. The changing role of central banks, *Financial History Review*, vol. 18, no. 2, 135–54
Goodhart, C. A. E. and Illing, G., eds. 2002. *Financial Crises, Contagion, and the Lender of Last Resort: A Reader*, Oxford, Oxford University Press
Goodhart, C. A. E. and Jensen, M. A. 2015. A commentary on Patrizio Lainà's 'Proposals for full-reserve banking: a historical survey from David Ricardo to Martin Wolf', currency school versus banking school: an ongoing confrontation, *Economic Thought*, vol. 4, no. 2, 20–31, http://www.worldeconomicsassociation.org/files/journals/economicthought/WEA-ET-4-2-GoodhartJensen.pdf
Haldane, A. G. 2017. *'A Little More Conversation, A Little Less Action'*, speech to the Federal Reserve Bank of San Francisco, Macroeconomics and Monetary Policy Conference, 31 March
Hayek, F. A. 1978. *Denationalization of Money: The Argument Refined*, London, Institute for Economic Affairs
Independent Commission on Banking. 2011. *'Final Report and Recommendations'*, London, HMSO, September, http://webarchive.nationalarchives.gov.uk/20131003105424/https://hmt-sanctions.s3.amazonaws.com/ICB%20final%20report/ICB%2520Final%2520Report%5B1%5D.pdf, accessed 19 May 2016
Ingham, G. 2004. *The Nature of Money*, Cambridge, Polity Press
Jackson, A. and Dyson, B. 2012. *Modernizing Money: Why Our Monetary System Is Broken and How It Can Be Fixed*, London, Positive Money
Keynes, J. M. [1930] 1973. Economic possibilities for our grandchildren, pp. 321–32 in *Essays in Persuasion, Collected Writings*, vol. 9, London, Macmillan, for the Royal Economic Society
Keynes, J. M. [1936] 1973. *The General Theory of Employment, Interest and Money, Collected Writings*, vol. 7, London, Macmillan, for the Royal Economic Society
Kindleberger, C. P. and Aliber, R. Z. 2005. *Manias, Panics, and Crashes: A History of Financial Crises* (5th ed.), Hoboken, NJ, John Wiley & Sons

King, M. 2007. *'Turmoil in Financial Markets: What Can Central Banks Do?'*, paper presented to the Treasury Committee of the House of Commons, 12 September, http://www.bankofengland.co.uk/publications/Documents/other/treasurycommittee/other/paper070912.pdf, accessed 19 May 2016

King, M. 2009. *Speech to Scottish Business Organisations in Edinburgh*, 20 October, http://www.bankofengland.co.uk/archive/Documents/historicpubs/speeches/2009/speech406.pdf, accessed 1 June 2016

Kotlikoff, L. J. 2010. *Jimmy Stewart Is Dead: Ending the World's Ongoing Financial Plague with Limited Purpose Banking*, Hoboken, NJ, Wiley

Kregel, J. 2014. *'Minsky and Dynamic Macroprudential Regulation'*, Levy Institute Policy Brief no. 131

Kroll, M. 2015. 'The Monetary System in Crisis: Monetary Reform Proposals, and a Simple Suggestion for a More Effective Monetary Policy, World Future Council, Future Finance', Discussion Paper No. 1, 07/2015, http://www.worldfuturecouncil.org/inc/uploads/2016/01/WFC_2015_The_Monetary_System_In_Crisis.pdf, accessed 21 May 2016

Laina, P. 2015. Proposals for full-reserve banking: a historical survey from David Ricardo to Martin Wolf, *Economic Thought*, vol. 4, no. 2, 1–19

Masciandaro, D. and Rommelli, D. 2015. Ups and downs. Central bank independence from the great inflation to the great recession: theory, institutions and empirics, *Financial History Review*, vol. 22, no. 3, 259–89

McLeay, M., Radia, A. and Thomas, R. 2014. Money creation in the modern economy, *Bank of England Quarterly Bulletin*, Q1, 1–14

Mehrling, P. 2011. *The New Lombard Street, How the Fed became the Dealer of Last Resort*, Princeton, NJ, Princeton University Press

Mehrling, P., Poszar, Z., Sweeney, J. and Neilson, D. H. 2013. Bagehot was a Shadow Banker: Shadow Banking, *Central Banking, and the Future of Global Finance*. https://ssrn.com/abstract=2232016, accessed 20 July 2017

Monetary Policy Committee. 2013. *Forward Guidance*, 7 August, http://www.bankofengland.co.uk/monetarypolicy/Pages/forwardguidance.aspx, accessed 19 May 2016

Murphy, E. and Senior, S. 2013. Changes at the Bank of England, *Bank of England Quarterly Bulletin*, Q1, 20–28

New Economics Foundation. 2016. *Our Friends in the City: Why Banking's Return to Business as Usual Threatens Our Economy*, http://b.3cdn.net/nefoundation/b45df453702219060e_h8m6y71zc.pdf, accessed 1 June 2016

Rodriguez-Fuentes, C. J. 2006. *Regional Monetary Policy*, London, Routledge

Singleton, J. 2011. *Central Banking in the Twentieth Century*, Cambridge, Cambridge University Press

van Dixhoorn, C. 2013. *Full Reserve Banking: An Analysis of Four Monetary Reform Plans*, Utrecht, Sustainable Finance Lab

van Lerven, F. 2016. *'Public Money Creation: Outlining the Alternatives to Quantitative Easing*. London: Positive Money', http://positivemoney.org/publications/guide-public-money-creation/, accessed 1 June 2016

White, W. R. 2013. *'Is Monetary Policy a Science? The Interaction of Theory and Practice over the Last 50 Years'*, Federal Reserve Bank of Dallas Globalization and Monetary Policy Institute Working Paper No. 155, http://www.dallasfed.org/assets/documents/institute/wpapers/2013/0155.pdf, *accessed* 1 June 2016