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Endogenous money, liquidity and monetary reform*

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Following its revival in the 1980s, the idea of endogenous money became increasingly widely accepted. Indeed the 2008 global financial crisis was widely blamed on the untrammelled power of banks to create credit. As a result, among the ideas for reforming the monetary system are proposals designed to eliminate that power, that is, to make the money supply exogenous. The purpose of this paper is to go back to the theory of endogenous money in order to assess these proposals, in terms of what is desirable, but also crucially what is feasible. Central to this discussion is a consideration of the range of meanings given to money and endogeneity. It is argued that what is regarded as money under different conditions is an important element in money endogeneity, and is particularly relevant for the monetary reform debate.

Keywords: Basil Moore, endogenous money, liquidity, monetary reform

JEL codes: E4, E5, B2, B5

1 INTRODUCTION

The idea that money was endogenous experienced a revival in the 1980s due to Kaldor (1982) and Moore (1988), a striking development in an intellectual context dominated by Monetarism. Three decades on, the view that loans create deposits is now much more widely accepted and even in mainstream theory there is a limited form of endogeneity. The purpose here is to reflect on this evolution of economic thought, and to consider its application in the wake of the 2008 global financial crisis. This contribution is offered to honour the memory of Basil Moore, with whom I enjoyed many friendly discussions on these matters.

It is always important, in considering the evolution of ideas, to consider how concepts are understood and how terms have been used in different theoretical contexts, against a backdrop of an evolving reality. ‘Money’ and ‘endogeneity’ are no exception. It will be argued here that different perspectives within modern economics attach different meanings both to ‘money’ and to ‘endogeneity’; the concepts are employed differently according to methodological approach.

We start therefore with a discussion of the meaning of money, and then of the meaning of endogeneity and exogeneity of the money supply. This is followed by a contextualisation of the revival of endogenous money theory in the 1980s in relation to previous expressions of this theory. We then explore the way in which thinking on endogenous money has evolved since the 1980s in mainstream economics as well as in post-Keynesian economics.

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The crisis has added force to endogenous money theories, provoking a reaction in the form of proposals for a complete state monopoly of money; these proposals are assessed from the perspective of post-Keynesian endogenous money theory and the context of financial innovation, with its relevance for distinguishing money from liquidity more generally. The modern context is framed as a further stage of banking development.

2 THE MEANING OF MONEY

It is critical to any discussion of the endogeneity of money to understand what is seen as being endogenous. Within the mainstream modelling approach, money is represented by the variable ' M ' in the abstract, setting it apart from other financial assets. Money's primary role is seen as a medium of exchange rather than a means of payment (or settlement); in other words, it simply oils the machine of exchange. This corresponds to the thinking behind the Classical dichotomy, whereby money is a veil, with no real consequences beyond efficiency of exchange.

Empirical applications pin M down to what are regarded as the most common means of exchange. Central-bank definitions have evolved to encompass assets which are readily realisable as cash at par, normally a range of types of bank deposit, in addition to notes and coin. The latter, while the liability of the state, are nevertheless treated as pure assets, tied to the denomination of the national currency as the unit of account for contracts. Bank deposits have been seen as interchangeable with notes and coin (and time deposits with sight deposits) because of confidence that the central bank ensures that they are safe through regulation of, and liquidity support for, retail banks. But bank deposits are 'inside money': assets with matching liabilities (Gurley/Shaw 1960). Confidence in their convertibility was punctured by the recent banking crisis, such that the 'insideness' of bank deposits mattered for a while, until confidence was restored due to actions taken by the monetary authorities.

Critically for any discussion of money-supply endogeneity, bank-deposit money comes into existence as the counterpart to private-sector credit, as well as purchases on the open market of government securities. It then acts as a means of payment, settling debts, including extinguishing debt to banks. This goes beyond the means of exchange function, which need not include final settlement but rather can include an element of credit. A deposit is a liability of the bank matching credit which is an asset of the bank. But at the same time a deposit is an asset of the deposit holder while the credit is a liability of the borrower; once the credit is used in expenditure the deposit is held by someone other than the borrower. Thus, while deposit money and bank credit arise in tandem, they operate in different markets with different logics; money and credit are not equivalents and should not be confused.¹

To the extent that there are doubts about the convertibility of deposits, they are less liquid than cash, just as the liabilities of financial institutions outwith central-bank control are even less liquid. But the latter may be regarded as 'near-moneys', to be converted into money for payment, or even used in payments themselves, settling debts. There has been debate as to what should be included in a definition of money ever since the emergence of banking. Then, as financial innovation progressed, the range of liquid assets became more complex, forming what is referred to as a hierarchy of money (Minsky 1957; 1986; Bell 1998; Mehrling 2013). The liabilities of central banks have conventionally provided a benchmark as the asset for the ultimate settlement of debts. But now the emergence of

1. See, further, Chick/Dow (2013) on this distinction.

private moneys which are not denominated in terms of national currency but can be used for exchange (notably cryptocurrencies) has provided a new focus for debate.

The hierarchy is dynamic. Assets are more money-like the stronger the conventional judgement that they are safe, where safety is multidimensional given the different categories of risk. An alternative way of understanding the hierarchy is in terms of liquidity, with money being the most liquid. For monetary policy, the issue is which variable is linked most closely to expenditure plans. It was a key conclusion of the Radcliffe Report (Committee on the Working of the Monetary System 1959) that liquidity should be the focus of monetary policy rather than money. The money/non-money divide was hard to pin down; Keynes (1930 [1971]: 32–33) had already pointed to the difficulty of identifying the motivation behind choosing to hold demand deposits or time deposits. Particular liquid assets are more suited to some motivations than others (Chick 1991). But in any case it was argued that liquidity was the more important factor for aggregate demand.

But, as Chick (1973: 78) explains, the multidimensionality of liquidity prevents a straightforward ranking of assets. Liquidity depends on the degree of confidence in the valuation of an asset, the time-frame in which the asset is to be realised, and the expected penalty for liquidating it. But in a crisis all point in the same direction. Liquidity preference rises just as availability of liquidity diminishes: confidence in realisability falls, in a suddenly truncated time-frame, amid falling asset prices. There is a paradox: generally, the liquidity of assets falls just as liquidity preference rises. The supply of liquidity is thus generally pro-cyclical, not only because of the cyclicity of portfolio size, but also because of the cyclical pattern of the extent to which near-money assets are treated as as-good-as-money.

For Keynes, liquidity preference was at the heart of his macroeconomics, built in turn on his theory of uncertainty. Indeed for Keynes the institution of money arises out of uncertainty, satisfying society's need for a safe asset. Money is thus defined, within this framework, as a safe asset (or collection of equally safe assets). Liquidity preference is expressed by an increase in demand for more liquid assets as those more readily expected to be realisable, at short notice and without significant loss, in the safest asset – whatever can finally settle debts (Davidson 1972: ch. 8). But assessment of liquidity is vulnerable to changes in actual and perceived conditions. An asset which is regarded as safe may be revealed to be unsafe because of market movements; what is thought of as money may turn out not to have the characteristics of money. The degree of liquidity is different in different contexts, such as in the different dimensions of financial conditions, institutional arrangements and the state of expectations, each of which may have more or less relevance for each type of asset and for each potential group of asset-holders in each particular circumstance (Keynes 1936 [1973]: 240; Chick 1973: ch. 4). The supply of liquidity is thus vulnerable to discrete shifts as conventional judgements change as to how far particular assets are liquid and how reasonable were borrowing expectations.

Within the mainstream approach, where the demand for money has some interest elasticity, money conforms to the norm of general substitutability. Money therefore is only one asset within a portfolio theory approach. Indeed the inclusion of time deposits in official measures of money, and consideration of less liquid assets, implies that money is something to be held as well as spent. By implication, money is simply at one end of a continuous liquidity spectrum, without a firm distinction. Liquidity preference (other than transactions demand) is therefore something which can be satisfied other than by money. But for Keynes the distinction between money, which is seen as capable of settling debts, and all other assets can be critical, especially in times of crisis. The contextuality and conventionality of the money/non-money dividing line then also becomes critical. But, while it might seem that the issue is to identify the appropriate cut-off point within the hierarchy of money,

distinguishing money from non-money, there is no such categorical distinction for general application. Further, classifying non-money assets as ‘debts’, Keynes (1936 [1973]: 167, n. 1) argued that ‘we can draw the line between “money” and “debts” at whatever point is most convenient for handling a particular problem’.

This post-Keynesian view of money differentiates between the functions that money performs and the assets which at any time can perform those functions. These assets are some form of debt, or social relation, with their liquidity dependent on the degree of confidence that the debt will be honoured at or close to par value. Where, as in some post-Keynesian theory, the means of payment function dominates, the identification of money assets is limited to those which can settle debts denominated in money as the unit of account. But where, following Keynes, money’s role as a store of value dominates (in macroeconomic terms) over facilitating transactions, what performs this function – that is, what is deemed to be safe – is changeable in a dynamic and often a systematic way. In discussing the difference between money and the assets which at any time perform money functions, Keynes (1930 [1971]: 3) argued as follows: ‘if the same thing always answered to the same description, the distinction [between money as the unit of account and the assets which make up money] would have no practical interest. But if the thing can change, whilst the description remains the same, then the distinction can be highly significant’.

We will see how the different understandings of money have coloured theory about its endogeneity or exogeneity of supply. In particular, the identification of money with its role as a medium of exchange has risen to prominence again with new proposals for fundamentally challenging actual exogeneity or endogeneity with new private monies on the one hand and a state monopoly of money on the other.

3 THE MEANING OF MONEY-SUPPLY ENDOGENEITY

The term ‘endogeneity’ has a range of meanings, a crucial distinction being whether it refers to real processes or to the technical characteristics of formal models. Desai (1987) argues that its proper meaning refers only to the specification of formal models. A formal model is a closed system which requires some variables to be classified as endogenous and the rest as exogenous. But there is a fundamental difference between mainstream theory, which is synonymous with its formal models, and non-mainstream theory, which uses formal models only as partial arguments within an open theoretical system. Moore’s work (as in Moore 1988) exemplifies this open-system methodology, employing formal models to great effect, but embedding them in a rich and diverse set of arguments.

Models and theories tend to be conflated in mainstream theory, such that what is not explained by the model remains unexplained. In the narrow, formal modelling sense, variables are classified dualistically as ‘endogenous’ or ‘exogenous’; duals are all-encompassing, mutually exclusive categories with fixed meaning. This classification takes on great significance since some exogeneity is crucial within a general equilibrium framework. A shock is required to cause motion, and unanticipated changes in the money supply performed that function for a long time, regardless of whether or not it was controllable in practice (Dow 1997b). Experience of the recent crisis has had an impact on mainstream monetary theory such that the banking sector is now included in some models; previously it had been fully represented by the money supply² and the official interest rate (Jakab/Kumhof 2019). Indeed, endogenising money and credit is a defining characteristic of ‘New Monetarism’

2. Sometimes not even that; see for example Woodford (2003).

(Wright 2018). But for the most part neither endogeneity nor exogeneity is explored or explained in terms of real processes.

In contrast, non-mainstream theory starts with real experience, such that ‘endogeneity’ refers primarily to the way in which reality is conceptualised.³ In terms of real processes, the money supply is endogenous if its supply responds in some degree to demand. But this is not an ‘either/or’ issue. Given the scope for different degrees and types of response, the endogeneity–exogeneity distinction is not dualistic. Both the degree and the source of endogeneity depend on the nature of the monetary system. It is crucial whether in a particular context the central bank actually has it in its power to control the money supply, that is, whether exogeneity is even possible. If not, the discussion, as among post-Keynesians, surrounds the question of the nature and degree of endogeneity.

For realists, theorising is designed to capture key causal mechanisms in the real world, within which, as an open system, strict exogeneity can scarcely apply.⁴ Where formal models are used, some variables are classified as endogenous and the rest as exogenous *for the purposes of those models*. In terms of the full body of theory, variables which are exogenous within these partial analyses are ‘givens’, to be explained by another analysis. Thus Keynes took the money supply to be given in some of the analysis in *The General Theory*, having already analysed in *A Treatise on Money* how it is determined by the banking system (Dow 1997a). In any case, his income-multiplier mechanism implicitly requires new bank lending to finance new investment (Chick 1983: 260). Within a post-Keynesian framework, therefore, it is a technical matter whether money is treated as exogenous within any partial analysis. It is not used as a universal theoretical distinction.

We have focused here on endogeneity in terms of causal mechanisms with respect to credit and money, whether within partial systems based on experience or in terms of the requirement of formal modelling. In what follows we will explore further the sources of endogeneity in both systematic and discrete changes in what is regarded as money.

4 THE EVOLUTION OF ENDOGENOUS MONEY THEORY

While the term ‘endogeneity’ came into common use as macroeconomics evolved as a modelling exercise, the idea that the money supply responds to demand is an old one. The early evolution of money clearly involves social relations, either cooperative or coercive, and indeed can be analysed in semiotic terms (Wennerlind 2001). The argument for endogeneity gained force once notes as tokens of the safekeeping of metallic money became acceptable in settlement of debt, allowing the early banks to initiate loans in the form of new notes. As confidence in banks grew, they were able to create more credit with backing by ever-smaller proportions of reserves. Bank regulation and central-banking practices evolved partly to tame that endogeneity, that is, the elasticity of supply (Chick 1986; 1993). The motivation at some times was primarily inflation control and at others promoting financial stability.

Until the twentieth century, the focus of discourse was on real banking practices and the real possibilities for the central bank in terms of curtailing the responsiveness of money supply to demand, rather than as a property of formal models. As banking evolved, there

3. The term is also used in the formal modelling sense as appropriate. A more full discussion than here of the meaning of endogeneity is provided by Winnett (1992).

4. The exception is when the system under study is the private sector, such that state action (such as setting the interest rate) can be classified as exogenous *in reality* (see further Dow 1988). But even then a political economy analysis might endogenise the interest-rate decision.

was debate as to whether in fact the expansion of bank balance sheets should be constrained, and as to how far it was possible to do so. These arguments were played out at different stages of banking development, in the debates between the bullionists and anti-bullionists at the end of the eighteenth century, and between the currency school and the banking school several decades later. An important aspect of these debates was over direction of causality – from money to economic activity or vice versa. It is possible to identify some parallels between these debates as opposition between exogeneity and endogeneity positions. But care is required in taking into account not only the different approaches to theorising taken by different parties in different eras, but also the different stage of banking development to which they referred (Chick 1986; 1993). But by the time of the debate between Monetarists and Keynesians in the 1970s a divergence was emerging between formalism and realism, with much of the discussion focusing on formal macro models rather than actual banking practice.⁵

The emergence of inflation in the 1970s and the debates between Keynesians and Monetarists refocused attention on the endogeneity–exogeneity debate, expressed most commonly in the modelling terms of the Neoclassical Synthesis. As mathematical formalism increased its grip on macroeconomics, the dualism of the debate was reinforced, encouraging Moore to cast his argument in terms of the duality of a horizontal money-supply curve as opposed to a vertical curve. The core argument was that the money supply was *intrinsically* endogenous, such that the idea of a controlled money supply could only be fictitious. Further, the supply of credit was perfectly elastic at a mark-up on the (exogenous) official rate; banks could meet all creditworthy demand for credit at that rate because the central bank enforced the official rate by supplying liquidity (and thus any necessary reserves) to the wholesale market in response to demand.

A limited form of endogenous money had been a longstanding feature of mainstream theory, in the form of the bank multiplier by means of which banks create credit to a multiple of any addition to reserves.⁶ Crucially, contrary to Moore's argument, it was still assumed that the central bank controlled the stock of reserves. But the volume of bank deposits was then determined by the public's choice of cash–deposit ratio (and thus velocity of circulation) and by the banks' choice of how far to use up their lending capacity. However the ratios were generally deemed to be stable when money's role was restricted to facilitating transactions and when the credit market was presumed to clear, so in practice the money supply remained exogenous. In any case this way of thinking about exogeneity and endogeneity was increasingly superseded in mainstream discourse by the loanable funds approach whereby banks are depicted as intermediaries between savers and investors, lending out pre-existing deposits (see, further, Hansen 1951; Laidler 1999). Indeed this understanding persists in textbooks and public discourse.⁷

The money supply as an exogenous variable continued to serve the important methodological function of sparking off endogenous change in general equilibrium models. However, with the emergence of real business cycle theory in the 1980s, real technology shocks supplanted the money supply, which was turned into an endogenous variable. Money production was assumed to respond, pro-cyclically, to the demand for transactions services, without particular exploration of how that occurred. Money continued to be

5. See Wray (1990) for a history of ideas on endogenous credit and money.

6. See Chick (2005) for a detailed review of the evolution of the money-multiplier theory in the twentieth century.

7. Nevertheless it has been challenged recently by Jakab/Kumhof (2019), albeit in an adaptation of a standard dynamic stochastic general equilibrium (DSGE) model.

neutral – the Classical dichotomy – with the interest rate a real rate. But now the money supply was unreservedly endogenous.

In any case, by the 1980s, real experiments in money-supply control had encountered obstacles in practice, and the policy variable of choice became instead the short-term interest rate. While New Classicals, now increasingly focused on real business cycle theory, were not concerned with monetary policy, New Keynesians forged what became known as the New Consensus, whose models represented monetary policy by the setting of the repo rate (Arestis/Sawyer 2008). For many decades it had been regarded as a matter of judgement whether monetary policy should rely on monetary control or the setting of the interest rate.⁸ As long as it was the latter, the money supply was endogenous in theory. But, as long as the demand for money function was reasonably stable, setting the repo rate effectively meant setting the money supply. And a stable demand for money function still implied transactions demand only. The leading guidance for monetary policy took the form of the Taylor rule for interest-rate setting in relation to an inflation target. In the short run the Classical dichotomy might be disturbed by constraints on market competition which stemmed primarily from information asymmetries. This took the form of credit rationing in times of interest-rate increase, adding power to monetary policy tightening in the short run. But the Classical dichotomy was preserved as a long-term outcome, to such an extent that in some models the rate of inflation was substituted for growth in the money supply.

Despite the resulting inattention to monetary aggregates, the exogenous money view has remained remarkably persistent. Attempts were made in 1979, in the UK for example, to control reserves directly, as if this were a matter of choice. But the argument prevailed that to do so could cause a liquidity crisis, triggering a banking crisis; the supply of reserves also had to respond to the need for financial stability (Foot et al. 1979). Still, even as late as 2009, the Bank of England explained quantitative easing in terms of injections of reserves, implying that banks were constrained in their lending (Benford et al. 2009). The experience with quantitative easing proved otherwise. By 2014 the reality of endogenous money, whereby the supply of bank deposits is the outcome of bank lending decisions, was set out in a Bank of England paper (McLeay et al. 2014). Nevertheless they stressed the traditional mainstream conclusion that central-bank control of the repo rate is an effective substitute for attempting to control the money supply directly.

In the meantime endogenous money was a key identifier of post-Keynesian economics, alongside the principle of effective demand (as a facilitator), and differentiation between a modern economy based on monetary production and the mainstream real-economy framework, with money as a veil. Davidson/Weintraub (1973) provided the theoretical context by directly challenging the mainstream view of money as causal. Credit supply is understood to respond (in some degree) to demand, whether to finance production or real investment, but may systemically divert to financing financial investment, increasing financial fragility and threatening the real economy. A financial crisis also threatens the hierarchy of money/liquidity, eroding trust in debt, and thus the capacity of banks to create credit. Finally there is a shared methodological feature of realism: the starting point is how monetary systems actually work, and only then is the theoretical apparatus constructed.

The core of post-Keynesian endogenous money theory is the fact that loans create deposits; banks are explicitly not depicted as intermediaries, but rather as responding to the demand for credit by means of creating deposits.⁹ This was the accommodationist,

8. Following Poole (1970), the judgement depended substantially on the relative instability of the investment and money-demand functions.

9. See Bibow's (2000) critique of loanable funds theory.

or horizontalist, endogenous money theory put forward by Kaldor (1982), and further developed by Moore (1988). In terms of its original formulation, one key feature is banks meeting all creditworthy demand for credit at a mark-up over the official rate; they are depicted as price-takers and quantity-setters. Another feature is a focus on the demand for money for transactions purposes rather than as a store of value. The demand for money is determined by the corresponding deposit rate but has no independent consequence. Liquidity preference theory is seen as being superseded by the logistical impossibility of controlling the money supply, a particular emphasis of Kaldor's (1982). Money is understood as whatever is required for settling debt – bank deposits – and the demand for money for transactions purposes is understood to be satisfied along with the demand for credit; liquidity preference in the additional form of the demand for money to hold is satisfied by other liquid assets and met by a change in return rather than quantity (Wray 1990: 16–20). Whatever money is created by new credit, and required for the borrower's planned expenditure, is eventually extinguished when that credit is repaid. This period-analysis approach, with a downplaying of liquidity preference, is shared by the circuitist approach, with which it is closely aligned (Rochon/Vernengo 2001).

The institutional/regulatory basis for credit provision has been explored further within the structuralist approach to endogenous money theory (Dow 2006). This approach emphasises the relevance of a financial structure for money–credit relations, where this situation evolves, particularly in response to regulatory changes (such as the introduction of capital adequacy requirements). Chick's (1986; 1993) stages-of-banking-development framework identifies the general pattern of the stadial evolution of retail banks, central banks and non-bank financial intermediaries (NBFIs) and their interrelationships. The framework explains, for example, the shift from banks meeting the credit needs of productive firms to banks engaging, along with other financial intermediaries, in a massive expansion of credit driven more by competition over market share and by the potential for more attractive returns from engagement in financial markets than in addressing the financial needs of production. The endogeneity of credit creation turned from being socially useful to fuelling financial instability and maldistribution of income, that is, not being socially useful (see for example Turner 2011).

The credit-granting decision has also been addressed by means of liquidity preference theory, emphasising the significance of uncertainty (Dow 1996). First, the horizontalist reliance on the notion of creditworthiness implies an ability to measure lender's risk, which is belied by uncertainty. The inability to know quantifiable risk means that banks instead adopt conventional views about risk. These views are subject to discrete shifts as conventional judgements change, and this can happen in a systemic way as the financial cycle evolves in Minskyan fashion. As banks revise their judgements about creditworthiness as the upswing gains force, the supply of credit may rise. Further, banks may revise downwards their assessments of the riskiness of their overall portfolio positions as the cycle proceeds, that is, their own liquidity preference, and thus their overall exposure to illiquid loans. At the same time, households and firms may revise downwards their liquidity preference, increasing their demand for credit and reducing their demand for liquidity. The reverse processes operate in the downturn.

But it is important to note that, while we can present a systemic account of these processes, the significance of uncertainty is its own unpredictability. Thus, for example, while a Minskyan analysis of financial fragility can indicate the likely onset of a crisis, its timing and nature cannot be predicted. As elsewhere in post-Keynesian theory, the non-systemic consequences of shifts in confidence in predictions and valuations, as well as non-deterministic institutional change, imply that any modelling of systemic forces necessarily provides an incomplete account. We have seen, further, that the nature and significance of the hierarchy

of money is complex and ultimately indeterminate, belying a dualistic formulation in terms of 'money' and 'the rate of interest' as fixed categories (Chick/Dow 2002).

Not only is the perceived risk attached to credit vulnerable to change, but so is what is regarded as money itself, as the perceived liquidity of alternative assets alters. While in the cyclical upswing a wide range of assets is judged to be liquid, increasing financial fragility raises doubts as to the scope for liquidating these assets without loss, narrowing the range of assets judged to be safe. In a crisis, under high uncertainty, bank deposits and Treasury bills may come to be the only safe assets, and maybe not even bank deposits. Firms and households attempt to amass liquidity until they can be confident of committing to more illiquidity again. Banks too may hold back from meeting the demand for credit regardless of central-bank supply of liquidity. Thus, while in more confident times liquidity preference may be satisfied by a range of near-monies, in times of high uncertainty the range of acceptable forms of money narrows significantly. There would then be demand for bank deposits to hold, as well as to spend. Liquidity preference, then, is significant for the demand to hold bank deposits, interdependent with, but not the same as, the demand for credit.

The two – structural and liquidity preference – approaches are closely related. Innovation in new financial instruments, encouraged by regulatory and/or competitive forces, brings about changes in financial structure, introducing new forms of credit and also new near-monies. Both are vulnerable to collapse, as attempts to liquidate assets induce price falls which in turn threaten the value of loan collateral and the ability of the credit-granting institutions to honour their liabilities. So, while these circumstances encourage an increase in liquidity preference, they also cause a drawing-in of liquidity: the paradox of liquidity. When these near-monies are treated as being as good as money, they add to what is understood to be money; but this addition is vulnerable to changing perceptions of moneyness, adding another layer of money endogeneity.

5 ENDOGENOUS MONEY AND THE CRISIS

Deregulation of the financial sector and the innovation spurred on by the resulting sector-wide competition fuelled massive increases in credit, eventually bringing about the banking crisis of 2008. There had been attempts at reregulation in the form of capital adequacy requirements, but these had the unintended consequence of increasing systemic vulnerability. Securitisation practices caused a switch by banks from an originate-and-hold credit model to an originate-and-distribute model, with a range of consequences (Chick 2013). Among other things, securitisation loosened the traditional bank–client relationship which had involved a commitment for the term of the loan. The corresponding shift to reliance on market-pricing of risk diminished the role for judgement with respect to the originating of credit, something which was exacerbated by the embedding of loans in opaque structured products.

Chick (2013) has thus explained the crisis in terms of her sixth stage of banking development, represented by increased marketisation of finance due to securitisation. But arguably we are now well into a seventh stage characterised by the growth of shadow banking institutions. This development, like the previous stage, has been fuelled by regulatory attempts to control credit, shadow banking being outside the normal regulatory net. But Gabor (2016) argues that it is not primarily the regulatory separability of shadow banking which threatens the stability of the financial system, but rather the complex inter-connections between shadow banking, banking and the state through the key role of sovereign debt as collateral in both regulated and unregulated banking. This has increased

the fragility of the financial system and exposed its interdependence with the financing of the state.

The scope for the emergence of near-monies used to be limited by the fact that NBFIs engaged in significantly greater matching of maturities than retail banks. While NBFIs were pure intermediaries, banks benefited from their liabilities being used for payments, causing the redeposit ratio to be high. Now NBFIs also engage in significant maturity transformation themselves, supported by confidence (however warranted) in the safety of their liabilities. Shadow money is created in the form of repos (normally collateralised by government debt) as the counterpart to credit (often to finance activity in the financial sector itself, such as trade in structured products). Repos in turn involve promises to repurchase assets at given terms, where the promises are bought and sold in unregulated repo markets. There is therefore tremendous scope for falling asset prices to cascade through the system, from the government securities backing repos to assets embedded in structured products, where collateral may be rehypothecated many times. Such an implosion of value would threaten the liquidity of shadow money. But the ultimate reliance on government debt means that the market for this debt is also vulnerable. Financial instability now has the capacity to cause fiscal instability.

This new financial structure also erodes previous institutional segmentations because of intensified market diffusion. As Gabor (2016) argues, retail banks themselves create near-monies – shadow money – in the form of repos alongside deposits created by new credit. The ripple effect of asset-price collapse would then include the banks themselves. Yet central-bank protection in the form of providing liquidity against repos would succumb to the same vulnerability to collapse in collateral values. Indeed the move of high-quality sovereign debt into negative-yield territory underlines the need for central banks to be more pro-active. Thus, while central banks are under pressure to implement regulatory institutional resegmentation, they are under even more pressure to focus on market-making to stabilise collateral values (Mehrling et al. 2012; Gabor 2016). This is even more necessary given the preference shown by banks for seeking liquidity in the form of repos, because of their collateral backing, rather than uncollateralised lending in the wholesale money market. Here we have a further case of the evolution of the hierarchy of money. But then the need for sovereign debt issue or repurchase with an eye on stabilising both regulated banking and shadow banking may conflict with the need for debt management for fiscal purposes. For example, increased debt issue to bolster availability of collateral in repo markets may be regarded as unsustainable with respect to fiscal rules.

While repos now constitute an important element in the hierarchy of money, attention has returned to the narrow understanding of money as the means of final settlement of debts. Indeed the private sector has been pressing ahead with developing not only near-monies, but now also alternative means of payment, notably in the form of cryptocurrencies. So far these assets do not meet the requirements of money (Dow 2019). But now central banks are seriously considering introducing their own digital currencies. Some reform plans go further in proposing that the money–non-money divide be cemented by creating a central-bank monopoly in money, removing liquidity protection from banks and thus effectively eliminating bank deposits as a means of payment.

This development has been spurred on both by technological developments and by loss of seignorage from reduced cash use, but also by an urge to prevent another banking crisis with its fiscal cost. The crisis was widely blamed on credit creation which was excessive in relation to underlying value, that is, on excessive endogeneity of credit. The solution has thus been put forward not only to reduce, but actually to eliminate, that endogeneity (see for example van Dixhoorn 2013; Fontana/Sawyer 2016). Various plans revive similar ideas from the 1930s whereby the state would be given a monopoly in supplying

money. These ideas include full-reserve banking and sovereign money, where the latter could be implemented by issue of a central-bank digital currency. By implication, banks would lose their capacity to create credit, becoming financial intermediaries like the rest of the system.

The aim of these plans is therefore to create in reality the clear distinction we have noted in some monetary theories (both mainstream and non-mainstream) between money as a means of payment and alternative liquid assets. Final settlement would be made in digital balances with the central bank – a modern version of (central-bank) notes and coin, that is, state money. Any liquidity preference other than for transactions purposes is to be addressed separately by adjustments in the private financial sector. Since most plans include targeting the supply of state money, the aim is to try to make reality conform to theories where the money supply is exogenous.

But such a plan cannot prevent the emergence of near-monies any more than at present. The financial sector is remarkably innovative in developing instruments and practices for meeting demand – for credit and for near-money assets. Indeed this was something Keynes pointed out in response to Gesell's plan for a state monopoly of money. Keynes was sympathetic to the idea of preventing the hoarding of money from interfering with the achievement of full employment, but concluded that it would be confounded by financial innovation (Keynes 1936 [1973]: 353–358; Dow 2016). Near-monies are distinct from state money in that they are not generally a means of final settlement of debts. But they can be used to settle debts if the creditor is confident that they can readily be realisable in state money at par. Similarly, near-monies may be held for precautionary purposes, their liquidity again being a matter of conventional expectation. But when that expectation is challenged, with doubts growing about convertibility at par, precautionary demand would be diverted to ever-more liquid assets, ultimately to the new state money. The money–non-money distinction then is a matter of expectations and market conditions and cannot be enforced by a state monopoly. What is regarded as money in the economy is itself endogenous.

6 CONCLUSION

Here we have considered how different conceptualisations of both money and endogeneity have consequences for monetary theory and policy. While money-supply endogeneity in some form is now widely accepted as a feature of the real world, the implications differ according to theoretical framework. In particular we have seen the power of identifying money with a fixed range of assets. And yet we have explored the implications of considering *whatever is generally treated as money* as a further element of endogeneity. Not only does the fungibility of money make using monetary aggregates for modelling (rather than for models-as-aids-to-thought) problematic, but it also poses a practical challenge to the workability of a state monopoly of money.

The importance of this endogeneity can be captured to a considerable extent by a Minskyan analysis of the cycle in credit, borrowers' and lenders' risk, asset prices and thus financial fragility. The extent of what is treated as as-good-as-money is itself pro-cyclical, adding further force to the cycle. But it is important to bear in mind the underlying role of uncertainty: in qualifying judgements about creditworthiness, in influencing banks' liquidity preference, and the liquidity preference of borrowers. It is in the nature of uncertainty not to be deterministic, so any formal model inevitably cannot provide a complete account, even if such factors as the demand for money to hold are taken into account. Considering the different approaches within post-Keynesian endogenous money theory, there is scope, which is already being

exploited, for synthesis (Fontana 2003; Lavoie 2006; Chick/Dow 2013). But there is a difference of emphasis, with the structuralist approach (including liquidity preference theory) focusing much more than accommodationists on uncertainty, with its implications for non-deterministic institutional and behavioural change.

It has also been argued here that plans for a state monopoly of the means of payment are particularly vulnerable to the endogeneity of what constitutes money in any context. An onset of high uncertainty about the value of near-monies which have been held on the grounds of being as-good-as-money is likely to spill over into demand to hold the new state money. In the meantime, both regulated banking and shadow banking have accounted for a substantial proportion of credit creation matched by the issue of near-monies. The elimination of traditional retail banking is unlikely to put a major dent in that process. Indeed it is likely to divert even more credit creation from financing production to financing speculation. At the same time, unless central banks act to stabilise markets in key financial assets, the conditions are enhanced for another crisis.

Central banks may well innovate in substitutes for notes and coin to good effect for payments logistics. But it has been argued here that this should not be part of a mechanism for eliminating traditional banking. Given the endogeneity of what is regarded in the economy as money, enforcing a state monopoly of money is unworkable. The (Keynesian) policy focus is on fostering as stable a financial system as possible, in conjunction with fiscal policy, to provide a good foundation for investment planning. But eliminating state support for banking and focusing instead on controlling the supply of a digital version of notes and coin is likely to open up the financial sector to even more instability.

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