3

Advances in the Post-Keynesian Analysis of Money and Finance

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1 Introduction[1]

This chapter deals with the advances that have been provided by post-Keynesian economists in the field of monetary economics. When speaking of advances, a question that immediately arises is how far back in time should we go to deal with those presumed advances. The choice made here is to focus on the various themes and claims that have been emphasized by post-Keynesians and that turned out to have been validated by the way central banks implement monetary policy and by the events that occurred during and after the Global Financial Crisis (GFC). This decision raises an immediate problem, as some of the

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apparently new assertions that have been endorsed recently by central bankers had been advocated a long time ago by post-Keynesian economists. Hence, despite the choice being made, some of the *advances* might go far back in the past.

Another issue is that there is a multitude of themes that could be addressed, and this creates the problem of how they could be selected and organized. It occurred to me that one way of organizing them would be to split them according to whether they corresponded to the *horizontalist* view of post-Keynesian monetary economics or whether they fitted more the concerns of the *structuralist* view. During the 1990s, an unending debate occurred between the advocates of these two views. As argued by Rochon (1999, p. 271), retrospectively there were a number of similarities between the views advocated by the structuralists and those of New Keynesians, for both of whom there could be a shortage of high-powered money provided by central banks. I have argued that besides this, most elements of this debate have been gradually settled, in particular thanks to the distinction between the short-term interest rate under the control of the central bank and the other interest rates (Lavoie 2014, pp. 230–232). As a consequence, Sect. 2 deals with horizontalist advances, Sect. 3 with unconventional monetary policies, Sect. 4 with three views of banking, and Sect. 5 with structuralist advances. Section 6 will summarize and briefly conclude.

Since another presentation is entirely devoted to features, limits and developments of the stock-flow consistent (SFC) approach, I will not deal with it in this chapter, except incidentally, despite my own contribution to it. Needless to say, I consider that the SFC approach is an important advance of post-Keynesian macroeconomics and monetary theory, if only by clarifying the role of liquidity preference. Similarly, there will be no discussion of the post-Keynesian critique of the New Neoclassical Synthesis, also, and better called, the New Consensus Macroeconomics, as this is also dealt with in another chapter.

2 Horizontalist Advances

2.1 Endogenous Money and Interest Rate Targeting

For a long time, post-Keynesian authors have been arguing that the supply of money is endogenous, and that the best that the central bank can do is to target the short-term rate of interest. The claim goes back to some of the earlier post-Keynesians, such as Nicholas Kaldor, Joan Robinson, Richard Kahn, Anthony Cramp and Jacques Le Bourva, and it was developed into a book by Basil Moore. The latter author coined the expression *Horizontalists versus Verticalists*, criticizing the notion that the supply of money was an exogenous variable, which could be described as a vertical line in the money/interest rate plane. Instead, both Kaldor (1982) and Moore (1988), as well as Le Bourva (1992) in an article published in 1959, argued that the supply of money could best be conceived as a horizontal line, at the target rate of interest of the central bank. Over the years, the notion of what an *endogenous supply of money* really meant and the reasons for which central banks could do no better than to attempt to control short-term rates of interest, rather than the stock of money or high-powered money, have been made more precise. More will be said about these reasons in subsections as per below.

In the meantime, it is worth pointing out that some central bankers—see Jakab and Kumhof (2015, p. 130) for a relevant list—have gone out of their way to explicate to their readers that the central bank can control neither the stock of broad money nor the stock of high-powered money; except for the latter under some circumstances that will be elicited in a later section. For instance, Ulrich Bindseil (2004), from the European Central Bank (ECB), and formerly from the Bundesbank, has written that "today's views and practice on monetary policy implementation and in particular on the choice of the operational target, have returned to what economists considered adequate 100 years ago, namely to target short-term interest rates; and much twentieth-century thinking, which regarded quantities as suitable operational targets, is today nearly unanimously rejected by the central bank

community" (p. 10). Thus, post-Keynesians, who had clearly rejected the quantity approach ever since Kaldor (1970), and perhaps even earlier, were much ahead of their time, and this was reflected by Moore's 1988 book.

Bindseil and König (2013), for instance, have recognized that "the last 25 years have vindicated the substance of his thinking [Moore's] in a surprising way that could hardly have been anticipated in 1988. Central bankers have by now largely buried 'verticalism', at least when it comes to monetary policy implementation" (p. 385). The post-Keynesian view has always been that, even when central bankers were officially announcing growth rate targets of money supply growth rates or of borrowed reserves, they were in fact dealing with estimates of money demand functions, assessing the interest rate that would be in line with the growth in the demand for money. This confusion was perhaps useful to central bankers, especially in the 1980s, as they could claim that the monetary authorities were not responsible for the high rates of interest. However, Moore (1988) and other post-Keynesians—mostly the horizontalist branch of post-Keynesian monetary theory—saw through this veil, and argued instead that the controlled variable was the rate of interest and not the money supply. As Bindseil and König (2013) conclude, regarding Moore's 1988 book, "the developments since then have corroborated his theory and his views in a remarkable way" (p. 389).

What have been these developments? In the 1990s, several central banks started doing inflation targeting. However, several of these central banks, as well as others, then announced their target interest rate, for instance the Treasury bill rate or the overnight rate (such as the Fed funds rate in the USA). In some cases, the target interest rate had always existed, but it was kept secret, as it was believed that it was best for financial markets to be uncertain about the exact policy being pursued by the central bank. However, with the move towards more transparency, central bankers thought that it would be more efficient to have an explicit rather than an implicit interest rate target. The implementation of this target was then reinforced by the adoption, in many central banks, of the so-called corridor or tunnel system, with the target rate being set in the middle of this corridor, delimited by a ceiling and a

floor. The ceiling is the rate of interest on credit facilities (which had always existed, as the Bank rate or the discount rate), while the floor is the rate of interest on deposit facilities, that is, the rate of interest paid on reserves held by commercial banks at the central bank. The latter was a new instrument, which was thought to facilitate the implementation of the target interest rate. This interest rate, although previously adopted by a number of central banks, was finally implemented by the Fed in the US, in 2008, as a consequence of the GFC.

The main consequence is that the interest rate is disconnected from the amount of reserves in the system, a feature that BIS economists Borio and Disyatat (2010) call the *decoupling principle*. With the same amount of reserves, the actual overnight rate will tend to oscillate around the target interest rate, whether it is high or low, because an overnight rate which is in middle of the corridor will generate an equal opportunity cost, whether the bank is borrowing or lending its reserves. This reinforces the notion that central banks accommodate the demand for reserves, at the interest rate of their choice, as was always argued by post-Keynesians. Several statements made by several bankers confirmed it: "For a central bank which manages interest rates, the volume of reserves is not an independent variable but is the result of banks' demand at a given interest rate" (Bundesbank 2017, p. 24). To substantiate this statement, it is perhaps worth reproducing in full the following statement arising from some members of the Bank of England:

> As with the relationship between deposits and loans, the relationship between reserves and loans typically operates in the reverse way to that described in some economics textbooks. Banks first decide how much to lend depending on the profitable lending opportunities available to them — which will, crucially, depend on the interest rate set by the Bank of England. It is these lending decisions that determine how many bank deposits are created by the banking system. The amount of bank deposits in turn influences how much central bank money banks want to hold in reserve (to meet withdrawals by the public, make payments to other banks, or meet regulatory liquidity requirements), which is then, in normal times, supplied on demand by the Bank of England. (McLeay et al. 2014, p. 14)

2.2 Reversed Causality and the Defensive Behaviour of the Central Bank

Why do central banks need to focus on interest rates rather than on monetary aggregates? The standard explanation is based on the macroeconomics of the IS/LM model. Before financial innovations became generalized, it was said that instability was induced by changes in the real economy, which could best be tamed by controlling monetary aggregates. By contrast, modern financial systems have been marred by the instability of the demand for money, and hence, so the argument goes, central banks have been forced to move to interest rate targeting to provide stability to the economy.

The post-Keynesian explanation is based instead on a microeconomic examination of the way the clearing and settlement system functions. In a nutshell, as expressed by Wray (1998), "regardless of the Fed's stated target, the Fed funds rate is the primary target; that is, even when the Fed claims to adopt a reserve aggregate as a target, it in fact targets the Fed funds rate. Most central bank actions are defensive in nature, and are mainly undertaken to offset Treasury operations" (p. 97). This view was well expressed a long time ago by some central bankers, in particular in a paper by Lombra and Torto (1973), whose title is quite evocative: "Defensive behavior and the reverse causation argument". Their paper underlines that the day-to-day operations of central banks are essentially defensive. A similar point was later to be made by Bindseil (2004), when he argued that *autonomous factors*—elements out of the control of the central bank—modify the composition and size of its balance sheet and hence impact liquidity in the overnight interbank market. By contrast, the textbook view is still that additional reserves, thanks to open market operations associated with either outright purchases of assets by the central bank or through the more modern repo operations, cause additional bank credits, with the money multiplier playing an important causal role. The reverse causation argument completely rejects this approach.

Advocates of endogenous money have from the start adopted the reversed causation argument, by claiming that new bank credits or new bank purchases of financial assets from non-financial agents lead at once

to the creation of new deposits and induce the emergence of additional reserves. As pointed out by Wray (1998, p. 107), "in the real world banks make loans independent of reserve positions, then borrow reserves to meet requirements…. Certainly, no loan officer ever checks the bank's reserve position before approving a loan". This is supported by Werner (2014, p. 14), who says that he asked loan officers whether they checked if the bank had enough deposits or reserves before signing on a new loan: they all confirmed that they did not. From the point of view of central banks, Lombra and Torto (1973) argued that "monetary authorities' open-market operations are predominantly defensive and that such operations are undertaken not only to offset those factors which will lead to a change in the monetary base but also to accommodate changes in the demand for deposits and the demand for currency" (p. 53).

This was made particularly clear by the empirical work pursued by Eichner (1986), who concluded that: "no matter what additional variables were included in the estimating equation, or how the equation was specified (e.g., first differences, growth rates, etc.), it proved impossible to obtain an R^2 greater than zero when regressing the changes in the commercial banking system's nonborrowed reserves against the change in the Federal Reserve System's holdings of government securities" (p. 111). Thus, open market operations were completely unrelated to the amount of new reserves held by the banking system. This meant that autonomous liquidity factors—mainly government expenditure and taxes as we shall see later, but also foreign exchange reserves, the issue of banknotes or the *float*, which occurs in several clearing and settlement systems—could cause large fluctuations for reserves in the monetary system. If the central bank does nothing, and as the demand for reserves is very much interest-inelastic, this will induce large fluctuations in overnight interest rates. In the absence of a rate of interest on bank reserves, the overnight rate could fall to zero in the case of an excessive amount of overnight liquidity; or the overnight rate would explode in the case of a lack of liquidity and if central banks refused to lend reserves. In order to avoid these possible large daily fluctuations in the overnight interest rate, and hence in other short-term interest rates, the central bank must pursue defensive operations, so as to counter-act, that is, neutralize the effects of these autonomous factors.

All of this has nothing to do with macroeconomic considerations: it has to do with the workings of the clearing and settlement system. Reserve requirements are not there to constrain the creation of credits and deposits. Their role is to mitigate the fluctuations in the overnight interest rate that arise as a consequence of the movements in the autonomous liquidity factors when central banks are unable to estimate appropriately changes in these autonomous factors, in the demand for reserves, and in the true amount that they are actually supplying. This has been explained in excruciating detail in a series of papers by Fullwiler (2003, 2006, 2017), an Institutionalist post-Keynesian who has contributed to Modern Money Theory (MMT).

2.3 Modern Money Theory (MMT) and the Relationship Between the Government and the Central Bank

A clear advance in post-Keynesian monetary theory is the contribution of advocates of the so-called MMT, also sometimes referred to as neo-chartalists. In the past, post-Keynesians had been mostly concerned with the relationship between non-financial firms and the banks, and between the banks and the central bank. The main focus of the analysis of MMT is the relationship between the government and its central bank. Their inquiries have allowed post-Keynesians to better understand the importance of the autonomous liquidity factors discussed in the previous subsection, in particular the impact of government expenditure or of collected taxes on the reserves of the banking system. While this analysis can be said to have been first formulated by Mosler (1994), it gained academic recognition in the book of Wray (1998), which was extended in Wray (2012).

In these books, Wray explains that whenever the government spends, it issues a cheque or an electronic payment that goes through the clearing and settlement system. This means that the recipient of the payment gets a deposit in some banking institution, while the bank sees its deposits (its reserves) at the central bank increase. There is thus an autonomous increase in the amount of liquidity in the overnight

interbank market. Symmetrically, when the government collects taxes from an agent, the payment goes through the clearing and settlement system, so that there is a decrease in the bank deposits of the agent while the agent's bank observes a decrease in its reserves at the central bank. This is another example of an autonomous factor. Note that the money is not destroyed: the government now has a larger amount of deposits at the central bank. A surprising feature, at least from the point of view of those that have been brought up in the tradition of the loanable funds approach or of the IS/LM model, is that a government deficit tends to lower the overnight interest rate, while a government surplus—a surplus of collected taxes over the payments made by the government—leads to an increase in the overnight interest rate. Therefore, as pointed out in the previous subsection, the central bank must intervene so as to bring back the level of reserves to the level being demanded by commercial banks or to the amount required by bank regulations.

Monetary systems where there are no compulsory reserve requirements are a perfect case for the argument that the purpose of reserves is not to constrain the creation of bank loans and that central banks act essentially in a defensive manner. Canada is a good illustration of this, as was first pointed out by Wray (1998), because "the Canadian system makes central bank operations more transparent – reserves are not a lever to be used to control the money supply" (p. 107). I have provided an analysis of the Canadian monetary and payment system in a number of papers, showing that the simplicity of the Canadian system, with its zero-reserve framework, perfectly illuminates the accuracy of the post-Keynesian approach (Lavoie 2005). An additional feature of the Canadian system is that clearing is not done on the books of the central bank, as happens in most financial systems. Clearing occurs on the books of a private clearinghouse, run by the Canadian Bankers Association; only the settlement of the payments that have not been compensated throughout the day at the clearinghouse or that have not been counterbalanced on the overnight market occurs on the books of the central bank (Lavoie 2019).

As long as transactions do not involve the central bank, on its own or as the financial agent of the government, the amount of reserves (now called settlement balances in Canada) will not change and will remain

at zero. *Thus, there is no relationship whatsoever between economic activity and the amount of bank deposits on one hand, and bank reserves on the other*. When payments involve the account of the central bank at the clearinghouse, the positive (negative) balances of the central bank at the clearinghouse will exactly balance the negative (positive) balances of the overall banking system. By the end of the day, if collected taxes exceed payments by the government out of its account at the central bank, the monetary authorities will need to remove its positive balances at the clearinghouse, and thus provide extra balances to the banking sector; this is to bring the deficit clearinghouse balances of the private sector back to zero.

MMT advocates have underlined, as is obvious in the preceding paragraph, that there must be coordination between the government (the Treasury) and the central bank. In the Canadian case, bringing back the negative clearinghouse balances of banks towards zero is achieved by auctioning government deposits, moving them from the central bank to accounts at commercial banks. If the central bank has negative balances, government deposits at banks will be withdrawn and brought back to the central bank. Thus, at the very end of the day, the banks which are in a negative position at the clearinghouse know that there are banks whose overall positive position matches theirs, so that the overnight market can clear at the interest rate targeted by the central bank, in the middle of the corridor. As Wray (1998) noted, "the Bank of Canada intervenes to keep net settlement balances at zero, an operation that by its very nature must be defensive" (p. 107).

In the case of the United States, until very recently, the coordination occurred through the existence of special *tax and loan accounts* at commercial banks, so that federal tax payments only involved payments between banks, with transfers of reserves occurring inside the private banking system. Symmetrically, whenever the government would spend, funds would be transferred from the *tax and loans* account of the Treasury towards its account at the Fed to minimize the impact on the overall amount of reserves. With quantitative easing and the consequent vast amount of excess reserves, this feature has been suspended, since there is no need to control the amount of reserves anymore.

2.4 The Compensation Thesis and Foreign Exchange Reserves

It was pointed out earlier that changes in foreign exchange reserves are an element of the autonomous factors. It follows that if the central bank intervenes in foreign exchange markets, either because the country is on a fixed exchange rate regime or because there is a managed floating regime, autonomous factors will kick in. Thus, as is the case for any other autonomous factor, an increase or a decrease in foreign reserves will necessitate a neutralization operation from the central bank, either to bring the amount of reserves back to zero, as would happen in the Canadian case, or back to the level of reserves demanded by the banking system at the target interest rate.

This is occasionally pointed out by central bankers. For instance, the Bank of Canada (2004) states that if it buys Canadian dollars on exchange markets, thus losing some of its foreign reserves, "to make sure that the Bank's purchases do not take money out of circulation and create a shortage of Canadian dollars, which could put upward pressure on Canadian interest rates, the Bank 'sterilizes' its purchases by redepositing the same amount of Canadian-dollar balances in the financial system". Conversely, when it purchases foreign currencies on exchange markets and thus increases its foreign exchange reserves, "to sterilize the effect of the Bank's sales of Canadian dollars (and prevent downward pressure on Canadian interest rates), the Bank withdraws the same amount of Canadian-dollar balances from the financial system". The same ascertainment is made at the Fed. As Craig and Humpage (2001) point out: "When a country's central bank maintains an unchanged interbank rate as the intermediate operating target for its monetary policy, it automatically offsets (or sterilizes) the impact of any exchange-market intervention on its monetary base" (p. 1).

Thus, sterilization is not a matter of choice; it is a necessity as long as the central bank wants to keep the interest rate at its target level. Post-Keynesians, however, have long argued that sterilization occurred in general and has occurred in the past. I, for one, have argued in a number of places that this automatic sterilization is the rule rather

than the exception, even in the case of currency boards (Lavoie 2001, 2014, Chapter 7). This is what some French central bankers have called the *compensation thesis* in the early 1970s. The argument is that an increase in credit to the rest of the world will usually be compensated by a decrease in credit to the domestic economy. In the case of an overdraft financial system, where banks are systematically indebted to the central bank, this compensation will be truly automatic, as banks use the acquired reserves to reduce their debt towards the central bank. This is just a version of Kaldor's (1982) reflux principle (Lavoie 1999). It has been shown to operate repeatedly when the Bundesbank was the counterpart of the speculative attacks against weak European currencies. Some researchers have shown that the compensation thesis ruled even in the heyday of the gold exchange standard, thus invalidating the so-called Rules of the game.

In financial systems where the central bank holds large quantities of government securities, the compensation can be done at the initiative of the central bank, by conducting open-market operations, that is, by selling government securities to banks. The latter will only be too happy to cooperate, since securities carry higher yields than reserves, especially when these were not remunerated. Alternative ways to compensate or to neutralize increases in foreign reserves can also involve elements of the liability side of the central bank: the monetary authorities can transfer government deposits towards banks, or they can sell central bank bills to the private sector.

There are at least two consequences to the compensation thesis. First, as argued by Serrano and Summa (2015), the Mundell-Fleming open-economy version of the IS/LM is not useful and ought to be dumped. Running a balance-of-payment surplus (deficit) in a fixed exchange regime does not lead to a decrease (increase) in (short-term) interest rates and to an increase (decrease) in high-powered money or in the money supply, as was already argued early on by Arestis and Eichner (1988). In the case of an external surplus, there is no economic force that will bring about a balanced current account, in contrast to the standard view that asserted that increases in money supply would generate price increases and hence a fall in net exports. Naturally, in the case of an external deficit, with foreign reserves gradually disappearing,

the central bank will need at some point to reconsider its interest-rate target. The second consequence, as emphasized by Angrick (2017), is that the compensation thesis questions the trilemma, familiar to students of international finance. The issue is not whether the economy is on a fixed or flexible exchange rate; the issue is whether the country is running an external deficit or surplus—something that begins to be recognized by other economists.

3 Unconventional Monetary Policies

3.1 Quantitative Easing

Quantitative easing, that is, the goal of raising and targeting the size of reserves held by commercial banks, had been earlier pursued by the Bank of Japan. The Japanese economy had stagnated since the crash of the stock market and of the real estate market in 1990. Despite the admonitions of such mainstream luminaries such as Krugman and Bernanke, Japanese officials had been reluctant to pursue quantitative easing, and hence only first tried it in 2001 (Koo 2009, p. 73). It was abandoned in 2006, as Japanese central bankers ended up doubting its capacity to get the real economy going and to raise the rate of consumer price inflation, although it was recently resurrected.

As argued by Lavoie and Fiebiger (2018), there are two views of quantitative easing: the monetarist or Friedmanian view on one hand, and the (post-) Keynesian view on the other hand. The Friedmanian view of quantitative easing, in its strongest incarnation, supposes the relevance of the standard money multiplier and of monetarism: more reserves will automatically be multiplied into a larger stock of broad money, which will generate a larger nominal GDP and possibly hyperinflation, as was first feared. Looked at from this angle, there is nothing new (or unconventional) with quantitative easing: it is monetarism in reverse gear. The strong Friedmanian view has been totally discredited, since huge increases in bank reserves only led to a weak growth in broad money supply and to barely any impact on inflation rates. The weaker variant of the Friedmanian view, based on the New Keynesian bank

lending channel, asserts that the increase in reserves provides banks with the loanable funds that they need to boost credit supply and economic activity. The lack of explanatory power of the money multiplier mechanism is blamed on banks, which are said to be hoarding excess reserves for fear of incurring losses on their loans. Needless to say, post-Keynesians reject both variants of the Friedmanian view.

The post-Keynesian view is similar to that of Keynes (1930) who did advocate quantitative easing in dire times in his *Treatise on Money*. Keynes (op. cit.) thought that persistent open-market operations destined to raise the size of the balance sheet of the central would bring down to zero the overnight interest rate and would manage to slash long-term interest rates. He thought that the fall in interest rates would also generate a rise in equity prices, and hence would get the economy out of the slump (Lavoie 2016). These are the two main mechanisms, with their possible effect on currency devaluation, that are envisaged by post-Keynesians today, although they very much doubt the efficacy of quantitative easing to raise real output, unless accompanied by an expansionary fiscal policy. As the saying goes, 'you can bring a horse to water, but you can't force it to drink'.

The post-Keynesian understanding of quantitative easing is consistent with its view of endogenous money alluded to earlier: banks do not need reserves to make loans; nor do they need deposits for that matter. Supplying more reserves will not induce banks to make more loans: they have already made all the loans they were willing to make to their creditworthy borrowers at the going rates of interest. Banks can only lend reserves to other banks or participants to the clearing system; they do not lend reserves to firms or households, a point made among others by Fullwiler (2013, 2017). As indicated by various central bankers (Martin et al. 2016; Keister and McAndrews 2009), the quantity of excess reserves is neither a measure of the unwillingness of banks to provide loans nor of the effectiveness of quantitative easing. Ábel et al. (2016) suggest that "the widespread criticism that commercial banks keep the money with the central bank rather than lending it the real economy is misguided" (p. 52). There is nothing that the banks can do to reduce the amount of reserves in the system as long as the central bank declines to engage in a transaction with them. For instance, banks

can purchase bonds until they are blue in the face, in no way will this reduce the overall size of bank reserves unless the central bank is the counterparty to the sale. Banks, taken as a group, cannot reduce the level of their reserves at the central bank, unless they operate within an overdraft financial system, as we shall see later.

A similar mechanism is involved when explaining why, in several instances, large increases in reserves have led to *smaller* increases in bank deposits, thus generating an apparent money multiplier smaller than unity. As illustrated with balance sheets in Lavoie (2014, p. 226), this is because the non-bank agents who have sold their financial assets to the central bank in exchange for bank deposits may decide to deleverage and use the acquired deposits to reduce their debt towards banks. Koo (2009), a financial advisor, has often insisted that financial crises were accompanied by balance-sheet recessions, meaning that private agents pursue debt-minimization and use any cash to reduce leverage. His analysis of the Japanese stagnation is consistent with the demand-led approach of post-Keynesian economics. While banks may decline to make loans because of the large capital losses that they suffered at the beginning of a bad crisis, in general, bank credit will be determined by the demand for loans of creditworthy borrowers, and when sales or revenues are stale, this demand will not be forthcoming. Borrowers, not lenders, become the bottleneck.

While the consequences of quantitative easing seem to vindicate post-Keynesian monetary theory, one inconsistency arises (Lavoie 2010). Post-Keynesians assert that the money supply and the supply of high-powered money are demand-determined. With quantitative easing, however, while this assertion remains true with respect to broad money and banknotes, it is no longer the case for bank reserves at the central bank. Post-Keynesians, at least those of the horizontalist camp, see the supply of high-powered money as being a horizontal line, set at the target overnight rate. This is meant to represent the claim that between meetings of the interest-setting committee of central banks, the latter will do their best to supply any amount of reserves which is exactly equal to the demand for reserves at the given target overnight interest rate. However, with quantitative easing, the supply of reserves can be considered as a vertical line, as the central bank can set the

supply of reserves without caring about the short-term interest rate. While this may fit the MMT distinction between the horizontal and vertical components of the money supply (Wray 1998, p. 111), more needs to be said.

Post-Keynesians usually reason that central banks have little control over the supply of reserves, first, as argued earlier, because the main focus of central banks is interest rates, but also because if the central bank were not to provide enough unborrowed reserves, the supply would still be demand-led: banks would acquire the missing reserves by borrowing them from the central bank at the discount window or at the credit facilities of the central bank. Furthermore, if the central bank were to provide an excessive amount of reserves, banks that had taken advances at the central bank would use these additional reserves to reduce their indebtedness vis-à-vis the central bank—the case of overdraft economies—thus getting the supply of reserves equal to the demand for reserves through a Kaldorian reflux mechanism.

There is an alternative to the corridor system and to the ceiling system, wherein the latter case banks have to borrow reserves from the central bank, and that is the floor system. In the floor system, the target overnight interest rate is the rate found at the bottom of the corridor—it is the rate of interest on reserves. The floor system was proposed by post-Keynesians (Fullwiler 2005) and central bankers alike (Keister et al. 2008). In fact, the Reserve Bank of New Zealand and the central bank of Norway both did adopt the floor system *before* the financial crisis actually occurred. In the case of the floor system, there is a total disconnect between the overnight interest rate and the amount of reserves. The link between short-term interest rates and the supply of reserves is completely severed—a full decoupling principle. With the floor system, it is possible for central banks to control the amount of reserves in the system, so that the supply of reserves far exceeds the amount of required or demanded reserves. In systems with no compulsory reserves, similarly, the central bank can have a supply of reserves that is way beyond zero. In the case of the floor system, which is a feature of quantitative easing, the supply of reserves is not demand-led—an amendment that must be made to post-Keynesian monetary theory (Lavoie 2010).

3.2 Other Alternative Monetary Policies

With the GFC came several unconventional or alternative monetary policies. I have already mentioned quantitative easing as it is usually understood, but as left-wing observers became frustrated with the rise in equity prices unaccompanied by increases in real output, they proposed to have QE for the (ordinary) people, sometimes called helicopter money. This is an *apparent* variant of the sort of QE that was pursued by the Bank of England, as a way to circumvent the banks, which are presumed to sit on their reserves, where financial assets are purchased from non-banks rather than from banks, thus raising the amount of deposits held by non-bank agents. In the case of QE for the people, households are provided by the central bank with additions to their bank deposits (or with currency). Thus everyone, not just asset holders, benefits from QE.

However, these two forms of quantitative easing are in fact quite dissimilar. In the case of the standard QE, just as in the case of credit easing, as defined by the Fed, what we have is a swap of financial assets, as the sellers of risky assets such as mortgage-based securities (MBS) acquire safe financial assets (credit easing) or bank deposits (standard QE). There is no increase in the net worth of the private sector. This is akin to a monetary operation. In the case of QE for the people, by contrast, their net worth increases by the amount of the helicopter drop. As Fullwiler (2013) says, "helicopter drops are fiscal deficit-spending operations, not monetary policy operations" (p. 188). Thus, as pointed out later by Lavoie and Fiebiger (2018), besides determining which institution—the central bank or the government—holds the negative net worth, "all the consequences of QE for the people are identical to those of a government deficit generated by a transfer of funds from the government to the population, with the government issuing securities that eventually end up on the balance sheet of the central bank" (p. 143). As long as the rate of interest on reserves is no different from the Treasury bill rate, the consequences for the net payment flows of the government are identical. As long as interest rates are positive, the government deficit will induce additional interest payments. With QE for the people, the central bank will have to pay interest on reserves, while

there is no counterpart asset, meaning that its profits will diminish, thus leading to a reduction in the dividends that the central bank can distribute to its government, the amount of which is identical to the additional interest payments arising from the deficit (Fullwiler 2015).

The same can be said about several other proposals designed to help the ecological transition or to get the economy out of stagnation: central banks providing funds for green projects at a zero interest rate; central banks purchasing green bonds issued by firms engaged in valid green projects at a zero interest rate (in both cases, *green QE*); or central banks providing funds at a zero rate of interest to some public investment bank. In all these cases, the central bank ends up with a liability, the amount of which correspond to the extra reserves held by banks the minute the created funds end in the bank account of some recipient. Again, as long as there is a rate of interest on reserves, these central bank liabilities will have to generate interest payments that will reduce the profits to be distributed to the government. As Lavoie and Fiebiger (2018) contend, the exact same result could have been achieved if the government had itself subsidized these projects by providing finance at a zero rate of interest or "if it had itself engaged in public infrastructure projects and had financed these expenditures by issuing its own securities at market rates" (p. 143). As pointed out by Nersisyan and Wray (2016), "debt-free money will not remain debt-free for long unless the central bank wants to offer a zero interest rate policy (ZIRP) forever" (p. 1312).

An alternative to avoid this pitfall would be for central banks to abandon the corridor and the floor systems, with a return to unremunerated reserves, so that central banks would avoid making interest payments on the reserves generated by these QE operations. Commercial banks would be left with a huge part of their assets yielding a zero rate of interest, as was the case with ZIRP. In all likelihood, this would induce banks to raise the interest rate charged on their other assets, as was observed with negative interest rates on reserves. Discarding the corridor or the floor systems however is unlikely, as they have proved to be so resourceful at controlling overnight interest rates. Indeed the Fed announced recently that it would continue with its floor system (Board of Governors 2019).

Other alternative monetary systems heavily upgrading the role of the central bank have been either resuscitated or newly proposed. Variants of these include narrow money, 100% reserves, full-reserve banking, positive money or sovereign money. These proposals, the purpose of which is to avoid the recklessness of banking as observed with the GFC and to limit the power of commercial banks, have substantial similitudes. They have been criticized rather harshly by post-Keynesian authors (Fontana and Sawyer 2016; Nersisyan and Wray 2017), especially concerning the true role of banks. The comments made in the previous paragraphs apply to some of these proposals as well. I will not say much more on the topic, except to point out that an SFC model of full-reserve banking, based on one of Godley and Lavoie's (2007) models, implicitly demonstrates the drawbacks of (at least one version) of full-reserve banking. This is so despite the optimistic viewpoint of its author (Laina 2018), who shows that things run quite smoothly when there is an increase in government expenditure financed by the central bank, or if there is a one-off helicopter drop.

However, as Laina (2018, pp. 21–22) concedes, if the government is pursuing austerity policies, reducing government expenditure or increasing tax rates, this could cause a credit crunch. Sales will be lower than expected, and as a consequence, inventories and their associated demand for loans will increase. Banks will be unable to supply additional loans because their time deposits (the *investment accounts* of Fontana and Sawyer [2016, p. 1341]), which have to be the counterpart of loans, will drop rather than rise. In general, if firms raise their target inventories-to-sales ratio, they could also face a credit crunch. Similarly, there could be another credit crunch if there is a brisk rise in the liquidity preference of agents, with agents swapping their time deposits for cash or demand deposits (or *transaction* accounts). Once again, time deposits will be insufficient to cover bank loans; in addition, the 100% bank liquidity ratio that goes with full-reserve banking may not be achieved any more, as the available reserves of banks might not cover the amount of demand deposits. Reading this literature and its post-Keynesian critique, there is a feeling that advocates of full-reserve banking and its variants have some way to understanding how the monetary system and banks work in practice.

4 Three Views of Banking

4.1 The Two Mainstream Views

This brings us to an important question, that is, whether banks are truly different from other financial institutions. That question came particularly to the fore in the social media, back in 2012, when Steve Keen and Paul Krugman entered into an argument on whether banks could create credit *out of thin air*. Keen forced Krugman to clarify his own views on banking. In denying the validity of the post-Keynesian story, Krugman (2012a) first took a loanable funds approach: "If I decide to cut back on my spending and stash the funds in a bank, which lends them out to someone else, this doesn't have to represent a net increase in demand", thus implying that banks could not create purchasing power. He then moved on to a money multiplier approach: "A key limiting factor in the size of bank balance sheets is the amount of monetary base the Fed creates" (Krugman 2012b). These debates have generated further reflections about the specificity of banks.

One can say that there are three views of banking, as argued by central bankers Jakab and Kumhof (2015) and Ábel et al. (2016), as well as Werner (2016)—a heterodox economist whose views are very close to those of post-Keynesians on money matters. The first one is what the latter two groups of authors call the *financial intermediation theory* of banking. This is Tobin's (1963) *new view* of banking, while Jakab and Kumhof (2015) call it *the intermediation of loanable funds* model of banking. In this view, new deposits allow banks to make new loans. There is no real difference between banks and other non-bank financial institutions: they are all intermediaries, getting funds from savers and allocating them to willing borrowers. Bertocco (2011) argues that this stance, which he also associates with Tobin (1963), sees real capital as being transformed into deposits, thus enhancing the portfolio choice offered to savers: thus, the bank is just a veil (Godley and Lavoie 2007, p. 497). Loans from banks do not increase purchasing power and have no effect on aggregate demand, as in the first quote of Krugman (2012a), unless there is a difference in the propensities to consume of

lenders and borrowers. The best caricature of this view of banking is provided by Jakab and Kumhof (2015). They picture savers bringing some goods to the bank, for which the bank issues a deposit on the liability side. In stories based on the advent of banks through goldsmiths, this would be gold, but here it is gravel. The bank then records on its asset side that it has a new inventory of gravel. When the gravel is provided to some entrepreneur, the bank logs a loan on the asset side of its balance sheet. Clearly then, deposits make loans, and banks are pure intermediaries. As Jakab and Kumhof (2015) conclude, models based on such an approach are "entirely fictitious representations of reality" (p. 11).

A close variant of the loanable approach to banking is the New Keynesian credit channel. This view of banking is associated with authors such as Bernanke, Gertler and Blinder. For these authors, because of their expertise to screen applicants, banks are financial intermediaries that can provide credit to borrowers who cannot get it on financial markets. Thus banks are special, but not fully so, since they are just another financial intermediary as noted by Rochon (1999, Chapter 7), Bianco and Sardoni (2018, p. 169) and Jakab and Kumhof (2015, p. 15). Loans are restricted by the deposits of savers. When extended, New Keynesians refer to the second theory of banking, contending that the ultimate source of loanable funds is the reserves provided by the central bank.

The second theory is the *money multiplier* theory of banking (Ábel et al. 2016), also called the *deposit multiplier* theory (Jakab and Kumhof 2015) or the *fractional-reserve* theory (Werner 2016). This is the theory that Krugman (2012b) seems to endorse in his second quote. Tobin (1963) called it the *old* view of banking. This theory is well-known as it figures in nearly all textbooks in economics. For this reason, I will not dwell on it. Suffice is to recall that the money multiplier, associated with Friedman, played an important role in justifying policies of quantitative easing by central banks (Fiebiger and Lavoie 2019), and that the money multiplier theory is no more able to represent the reality of a monetary economy than the loanable funds approach.

4.2 The Post-Keynesian Credit Creation View of Banking

Finally, there is the third view of banking, which post-Keynesians endorse and usually refer to as the *endogenous theory of money*, as do Ábel et al. (2016). Bianco and Sardoni (2018) prefer to speak of banks as *originators of inside* money. Werner (2016) calls it the *credit-creation* theory of banking, while Jakab and Kumhof (2015) refer to the *financing through money creation* view of banking. In a recent verbal presentation, Steve Keen spoke of a *bank-originated money and debt* view. The last three denominations may in fact better illustrate what post-Keynesians have in mind when they speak of endogenous money or endogenous credit-money. This third view of banking is closely related to what has already been said on reverse causation and central banks in previous subsections. The third view denies that banks are constrained by prior deposits or by the amount of reserves in the system, since the causal arrow goes from loans to deposits to reserves, if these are required. There is no money multiplier; at best one could speak of a *credit divisor*.

For advocates of the third view, banks are special for several reasons. First, as already pointed out, they are not only financial intermediaries—their main role is to create new credit, out of nothing, or rather more often than not, based on some collateral. Their main role is not to be an intermediary between savers and borrowers. Whereas other financial institutions can provide credit, the main feature of banks is that they can provide new credit without having earlier collected funds or without having to borrow from some other agent. As central bankers McLeay et al. (2014) point out, "rather than banks receiving deposits when households save and then lending them out, bank lending creates deposits.… Indeed, viewing banks simply as intermediaries ignores the fact that, in reality in the modern economy, commercial banks are the creators of deposit money" (p. 15). As Jakab and Kumhof (2015) add, "in the real world, the key function of banks is the provision of financing, or the creation of new monetary purchasing power through loans.… The bank therefore creates its own funding, deposits, in the act of lending" (p. 3).

The second specific feature of banks is that their deposits are part of the payment system. They are the means through which debts are irrevocably discharged. Non-banks ultimately have to transfer funds to some bank account for the final payment to go through. Payment is final, or settlement occurs, once the bank payment goes through the books of the central bank, or in some countries through the clearinghouse run by a bankers' association, as in Canada. As Michell (2017) states, this is not the case for non-banks, as they "fund themselves by issuing liabilities which cannot be used for settlement purposes" (p. 363). Because the payment system is under the overarching responsibility of the central bank, banks have access to central bank advances (the central bank credit facilities) to settle payments when banks in a deficit position in the clearinghouse get an insufficient amount of overnight loans from other banks in the interbank market. I would argue that these advances exist to protect the payment system and to allow settlement, not to protect banks as such, and hence are not a specific feature of banks (as the interventions of central banks during the GFC has demonstrated). Moreover, neither are the state-insured deposits of banks—a relatively new feature in several countries anyway.

A key feature of banks, as related to the payment system, is that "as long as banks create credit at the same rate as other banks, and as long as customers are similarly distributed, the mutual claims of banks on each other will be netted out and may well, on balance, cancel each other out. Then banks can increase credit creation without limit and without 'losing any money'" (Werner 2016, p. 373). For Unger (2016), from the Bundesbank, this implies that "credit expansion in the traditional banking system is not subject to the laws of supply and demand to the same extent as it is for other parts of the financial system" (p. 5). This was long ago recognized by Keynes (1930, p. 23), and then Le Bourva (1992), who argued that with the compensation occurring at the clearinghouse, there would be no limit to the amount of loans that banks could create, provided that these banks "are all moving in step, with no one bank getting ahead or lagging behind" (p. 461).

This is not the case of non-banks, since, as we shall see, if they wish to create more credit, they must first get either more deposits from the public or new loans from banks. One could argue that the situation

is similar for banks: if their depositors decide to transfer their bank deposits at accounts in non-banks, then the banks in their turn will need to borrow funds from non-banks. The difference, however, is that when non-banks borrow, they need *financing* to start with; when banks borrow, this occurs after the fact. This is the distinction made by post-Keynesian circuitists (Botta et al. 2015), inspired in particular by Graziani (1989). At the start of the circuit, the credit creation by banks is associated with *initial finance*; the funds that need to be recovered after the fact are *final finance*, and are mainly the consequences of the portfolio decisions of non-financial agents. They arise from the decision about where to assign the flow of saving and the reallocation of wealth. Davidson (1982) made the same distinction, with his use of *construction finance* and *investment funding* respectively. The same has been emphasized more recently by Jakab and Kumhof (2015, p. 3) as well as Borio and Disyatat (2011, p. 7) for whom financing (initial finance) is a cash-flow concept whereas saving (final finance or funding) is a national account concept.

Jakab and Kumhof (2015) note "the critical importance of double-entry bookkeeping in the analysis of banking and finance" (p. 10). This is precisely the point made by a number of post-Keynesians in recent years, such as Godley and Lavoie (2007), and Bezemer (2011). Indeed, since each financial transaction involves both assets and liabilities as well as at least two agents, this means that a quadruple-entry principle is required to properly understand banking and finance.

5 Structuralist Advances

5.1 Credit Creation Versus Liquidity Creation

While mainstream economists tend to believe that non-banks and banks alike are financial intermediaries, some post-Keynesian economists argue that banks and non-banks play a similar role because they are both entities that provide *liquidity*, that is, non-banks are more than being mere financial intermediaries. Nersisyan and Dantas (2017) have recently put this view forward. It is a development of the

idea of a hierarchy of money (also discussed by Michell 2017), where some sorts of assets are more liquid than others, or where there would be *true* liquidity, associated with central banks and commercial banks on the one hand, and *fictitious* liquidity—fictitious because of its elusive nature—associated with some non-bank financial institutions. These authors do not reject the post-Keynesian theory of endogenous money, they try to improve it (Nersisyan and Dantas 2018, p. 655). They believe that it would be a mistake to present non-bank financial institutions merely "as passive entities that intermediate between savers and lenders".

While both mainstream economists on the one hand, and Nersisyan and Dantas (2017) on the other hand, would argue that banks and non-banks show great similarities, the former because banks like non-banks are unable to have much of an impact on the economy, the latter argue by contrast that the similarity arises because non-banks, just like banks, have the power to change the level of economic activity. They resurrect a neglected point made before by Palley (1996, p. 128), under the guise of the *endogenous theory of finance*, when he contended that both versions of endogenous theory, the horizontalist and the structuralist ones, "are flawed because of their exclusive attention to the banking system" (p. 128). Palley (op. cit.) argued that insofar as "the activity of direct capital markets are pro-cyclical" (p. 133), non-bank financial institutions will also influence economic activity. In the words of Nersisyan and Dantas (2017), non-bank financial institutions are "liquidity creators", the activities of which "affect the real economy", and thus "they can be a source of instability" (p. 281). Thus, for these two authors, the specificity of banks that was described in the previous section relative to non-bank financial institutions "does not capture the elasticity of finance, or the financial fragility that may arise due to the activities of these institutions …. The ability of the financial sector to create liquidity is much more elastic than the endogenous money theory allows for" (Nersysian and Dantas 2017, pp. 297–298).

Nersysian and Dantas (2017) provide various statements by well-known post-Keynesian authors to show that post-Keynesians in general, used to pay little attention to the activism of non-bank financial intermediaries. While they do not mention him, perhaps the best illustration

of the lack of attention accorded in the past to the role of these non-banks can be found in the following statement by Eichner (1987): "It is only through a bank loan that the amount of funds circulating as checkable deposits can increase. If, instead, funds are borrowed from a non-bank financial intermediary, the latter will need to draw down its cash balance at some bank…. This is why the existence of nonbank financial intermediaries can usually be ignored and the flow of funds model simplified by eliminating the nonbank financial sector" (p. 825).

For most economists, the key characteristic of a financial institution is maturity transformation. On this account, one can argue that both banks and non-banks take short-term liabilities and hold longer-term assets. The advocates of liquidity creation as a hierarchical process add that banks and non-banks provide liquidity transformation, accepting to transform the less liquid debts of those institutions sitting at the bottom of the monetary hierarchy into liquid ones. As the following aphorism goes, "everyone can create money; the problem is to get it accepted" (Minsky 1986, p. 255).

The issue as I see it, taking note, however, of the power of non-bank financial institutions to affect the stability of the economy, is whether it is useful to consider banks as very special financial institutions, different from other financial institutions. As I pointed out myself, the variety of operations in which non-banks can engage in today "make murkier the distinction between *bona fide* banks and non-bank financial institutions" (Lavoie 2014, p. 259), the more so because non-bank financial institutions often have some kind of association with banks, even if legally they are entirely separate entities. However, in a comment on Nersysian and Dantas (2017), Bouguelli (2018) argues that "making a sharp distinction between commercial banks and other financial institutions" provides a "framework that has the advantage of clarity" (p. 653). To speak of *true* liquidity versus *fictitious* liquidity illustrates the fact that banks and non-banks face different constraints and play a different role in the overall financial system. Considering the case of traditional investment banks (if they still exist!) as presented by Nersysian and Dantas (2017), Bouguelli (2018) insists that "the commercial bank and the investment bank are fundamentally different: while the commercial bank can buy the asset with its own liability, the investment bank has

to borrow the liability of a commercial bank (a deposit) in order to get hold of the securities" (p. 649).

All this is closely tied to the issue of whether the so-called shadow banking system is, or could be, at the origin of the excesses that were observed in the financial system, especially in the US, and that led to the GFC. The term *shadow banking* may be a misnomer if the institutions figuring within the definition of the shadow banking system do not carry the major features of *bona fide* banks. We deal with this issue in the next subsection.

5.2 Shadow Banks and the Credit Boom

Post-Keynesians are sometimes accused of not realizing that non-banks can also provide credit (even trade credit), so that in a modern monetary economy, bank credit is in competition with other sources of financing. Edwin Le Heron (1986), himself a post-Keynesian, made this critique a long time ago. It is perhaps worthwhile to consider T-accounts to better understand how non-bank financial institutions (noted NBFI in the tables) can originate credit of their own accord. We will deal with three cases, two of which deal with securitization. In the first case, we assume that a non-bank issues money-market funds (MMF) deposits that are desired by some wealth holders (with some resemblance with the case presented in Bouguelli [2018, Table 2]).

Start with a bank that makes a loan to a non-financial agent who desires to acquire some liquid assets (bank deposits) for future use. This is the first line of Table 1. Assume now that the depositor transfers 20 units to a non-bank financial intermediary by purchasing shares in a MMF (we could have assumed just as well that the non-bank is a finance company that issues commercial paper bought by the non-financial agent). This implies that the non-bank now has 20 units of deposits at the commercial bank, which it may decide to transform into a certificate of deposit (CD). This occurs in line 2 of the table. The non-bank is now in a position to provide credit to some other non-financial agent, for instance by purchasing securities worth 15 units, but by thus reducing its CD at the bank by 15, as Eichner (1987) would

Table 1 Credit creation by non-bank financial institutions

	Banks		NBFI		Non-financial agents	
	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
1	Loan 100	Deposit 100			Deposit 100	Loan 100
2	Loan 100	Deposit 80 CD 20	CD 20	MMF 20	Deposit 80 MMF 20	Loan 100
3	Loan 100	Deposit 95 CD 5	CD 5 Security 15	MMF 20	Deposit 95 MMF 20	Loan 100 Security 15

Source Own construction

have it. Line 3 shows the consequences of such a move. Whereas we started with bank loans of 100 units, we now have 115 units of credit: 100 units of bank loans and 15 units of sold securities. As to the non-financial sector, it now holds 95 units in bank deposits and 20 units as money-market shares for a total of 115 units of liquid assets, while the non-bank financial sector is left with 5 units of CDs.

To sum up: the overall amount of credit in the economy has risen; the amount of bank deposits has not; and the amount of liquid assets held by the non-financial sector has also risen. Thus, the non-bank financial system has contributed to the creation of liquidity, and has provided new credit, just as Le Heron, Palley or Nersysian and Dantas would have it. Note that the additional credit could have been provided just as well by the banking sector. Note further that the non-bank financial institutions would have been unable to provide any credit unless non-financial agents had previously transferred some of their bank deposits to the non-banks. Still, it is clear that in this first case the additional credit has originated from the non-bank financial institution, and not from a bank. A counterpoint, however, could be that the funds acquired by the non-banks have arisen initially from some previous bank loan.

We move on to the second case, tied to securitization, as described by Unger (2016). Here, start with a bank that grants a mortgage to some household; this is the first row of Table 2. In row 2, it is assumed that the real-estate builder is paid and acquires the deposits that were initially in the hands of the purchaser of the residence. A public institution or semi-public institution, such as a Government-sponsored enterprise

Table 2 Securitization with government-sponsored enterprises (GSE)

	Banks		NBFI (GSE)		Non-financial agents (NFA)	
	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
1	Mortgage 100	Deposit 100			Deposit 100	Mortgage 100
2	Mortgage 100	NFA deposit 30 GSE deposit 70	Deposit 70	CP 70	Deposit 30 CP 70	Mortgage 100
3	Mortgage 30	NFA deposit 30	MBS 70	CP 70	Deposit 30 CP 70	Mortgage 100

Source Own construction

(GSE) in the United States or the Canadian Mortgage and Housing Corporation, issues commercial paper (CP) which is bought by real estate builders who swap part (say 70%) of their bank deposits for commercial paper. In row 3, with the proceeds, the GSE is now in a position to purchase the mortgage loans and ease the maturity position of the commercial banks. Finally, "the loans are bundled together to form an asset-based security (ABS) which are then retained on the GSE's balance sheet" (Unger 2016, p. 7). In Table 2, these are denoted as MBS.

In the case described by Table 2, loan origination—initial finance in the terms of Graziani (1989)—is performed by banks, not by non-banks. However, funding—final finance—as it will appear at the end of the process, is now partly in the realm of the *market financial system*. It seems that banks are losing out to non-banks: this is true from the standpoint of *stocks*, but it is not when considering *flows*: the flow of credit does indeed originate from banks.

We can look at another case of securitization, as described by Table 3. Start again with mortgage loans being granted by a bank to some households. The deposits so created end up in the bank account of the real-estate constructor. In the second step, shown in row 2, 70% of the mortgages are securitized and sold to a non-bank financial institution, this time a bank-sponsored conduit—a Structured Investment Vehicle (SIV). The SIV purchases the MBS by getting a temporary loan from its sponsoring bank. In addition, in the last step, shown in row 3, the conduit manages to sell 60 units of asset-backed commercial paper (ABCP) to real-estate builders, whose bank deposits then fall down to 40 units.

Table 3 Securitization with a conduit

	Banks		NBFI (SIV)		Non-financial agents (NFA)	
	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
1	Mortgage 100	Deposit 100			Deposit 100	Mortgage 100
2	Mortgage 30 Loan to SIV 70	NFA deposit 100	MBS 70	Loan 70	Deposit 100	Mortgage 100
3	Mortgage 30 Loan to SIV 10	NFA deposit 40	MBS 70	ABCP 60 Loan 10	Deposit 40 ABCP 60	Mortgage 100

Source Own construction

In this case of securitization, it is clear once again that the loan originates from the banks; furthermore, the conduit needs to have access to bank loans to handle discrepancies between its purchases of MBS and its sales of ABCP. The same could be said about investment banks, when they are financed through repos (Botta et al. 2015). As Michell (2017) concludes: "In this analysis, the shadow banking system is seen as a 'loan storage' facility in which money claims are crystallized into less liquid, yet short-term claims—claims which exhibit many features of money, yet are not—not yet, in any case—'money proper'. In the process of transferring credit claims onto the balance sheets of shadow banking institutions, the deposit created when the bank originally made the loan is destroyed, and the monetary circuit closed…" (p. 373). This is the *originate-and-distribute* model of banking, which makes the chain from the initial borrower to the ultimate fund holder longer, more complex and more opaque. It is also likely to make the system more fragile, as risk is being passed along by the originator to agents who may lack a proper understanding of the characteristics of the financial asset.

When omitting bonds and shares, Unger (2016) estimates that, in 2007, 88% of the stock of loan obligations held by the banking and shadow banking systems originated from banks. The remaining 12% correspond to the case described with the help of Table 1. But even

there, it could be argued that a loan would not have been possible without the non-bank getting access to funds that were initially arising from a bank loan. For Unger (2016), in agreement with what seems to be the consensus post-Keynesian position on this issue, "the largest part of the shadow banking system enters the credit intermediation process only after the loans to the ultimate borrowers and the means of payment to finance them have already been created" (p. 14).

5.3 Are There Limits to the Creation of Bank Credit?

There are two views about the systemic role of the shadow banking system as it has evolved. The first view has been defended by Lysandrou and Shabani (2018). They argue that its growth was generated by a search for higher yields, at a time when interest rates were relatively low: rich households or institutional investors have induced banks to issue more loans and to decrease their lending standards to produce the structured securities that the investors were longing for. A variant of this argument is that there was a scarcity of safe assets, and that this induced the financial system to create AAA short-term and long-term assets through securitization. Within that variant, one could argue that the GFC was a systemic response to this scarcity of safe assets, as it led to large government deficits and hence to the appearance of large quantities of new safe assets.

The second view, which will be discussed here, is tied to regulatory arbitrage. This was already the view of Palley (1996) when he underlined the role of endogenous finance. For Palley (op. cit.), "raising finance in capital markets … is more expansionary [than bank loans] because it by-passes the monetary constraint imposed by reserve requirements…. This feature is generic to fractional reserve banking systems, in which central banks seek to impose a monetary control over the supply of reserves…. By taking transactions out of the banking system, this reduces the need for bank services, and helps circumvent emerging liquidity shortage within the banking system" (p. 133).

The belief that non-bank finance and the shadow banking system are essential elements of our monetary system is entertained by a large

number of economists, including some heterodox ones. The argument is that without the shadow banking system there would not be enough liquidity or enough credit in the economy. This is what seems to come out from Palley's (1996) citation above. Thanks to endogenous finance, the private financial system can evade the constraints imposed by the monetary authorities. Thus, what we have here is an extension and modernization of the view associated with the earlier developments of the critique of monetarism and its concept of a stable velocity of money, whereby post-Keynesians such as Minsky (1986) emphasized the capacity of the financial system to avoid regulation and reserve constraints through innovations, rather than using arguments based on reverse causation. In this respect, it is interesting to note that Palley (1996), when introducing the notion of endogenous finance, refers to Minsky and securitization. He argues that securitized assets "have liquidity properties that are close to money, and enable agents to reduce their needs for currency and those bank liabilities carrying reserve requirements" (p. 134).

Today, the argument about the need for credit elasticity circumventing banking regulations cannot be based anymore on reserve requirements; it is now based on the capital adequacy requirements (CAR) imposed by the Bank for International Settlements (BIS). Descamps and Soichot (2003) picked up the arguments and the model of Palley (1996), superposing to it the CAR—the Cooke ratio as it was then called. They end up alleging that the post-Keynesian causality must be reversed: banks need equity in order to make loans. Thus CAR in their scheme plays a role which is similar to the one played by reserve requirements in mainstream models. Banks must first obtain additional equity if they wish to grant more loans. "The fundamental constraint on credit supply is capital. From the banks' perspective, the presence of regulatory capital requirements acts like a hard constraint on asset expansion" (Disyatat 2011, p. 716). The lesson to be drawn from this perspective is that banks will be forced to ration credit when they do not have access to enough equity. Bank credit is at the mercy of the financial markets as these markets may or may not accept to provide enough equity. Hence, there is a justification for the presence of the shadow banking system and the existence of securitization, as these features of the financial system help to provide sufficient elasticity to the monetary system.

While one can accept that securitization is associated with regulatory arbitrage, this does not mean that capital requirements restrict the creation of bank loans. As Michell (2017) says, the process of securitization once it is completed allows "banks to initiate the circuit once again by creating a new loan and a new deposit, without reducing their (on-balance sheet) liquidity or capital" (p. 373). Banks get their profits by a one-off fee. In addition, even if banks take back the asset-based securities on their balance sheet, overall capital requirements are diminished as, at least in Basel II, capital requirements on residential mortgages were 50% of the 8% Cooke ratio, whereas requirements on AAA MBS were only 20% of the Cooke ratio. The post-Keynesian perspective ought to be that securitization allows banks to have a lower overall capital to asset ratio, which increases the rate of return on equity, and not that it allows banks to make more loans. It allows "the originating banks, as well as those purchasing the securitized loans, to extend leverage beyond previously recognized safe ratios, thus improving their returns on equity, while simultaneously fully abiding by the terms of the Basel capital adequacy ratios" (Lavoie 2012–2013, p. 226).

What if some banks have an overly low level of own funds? The response is that banks can take one or several of the following actions. First they can increase the spread between their lending rates and their deposit rates, which empirically is what seems to be the case for banks with low realized capital adequacy ratios, as recalled by Disyatat (2011, p. 717) and in Godley and Lavoie (2007, p. 403), where this option is pursued in their SFC model of the banking system. Second, banks can distribute less dividends to their shareholders. Unger (2016, p. 16) points out that the additional equity needed for the loans that were sold to GSEs and conduits between 1984 and 2007 could have been obtained by reducing by 29% the amount of dividends paid out to shareowners during the same time period. Third, banks can issue new shares to obtain more equity, or they could reduce the size of the stock options given to their top managers, thus avoiding buy-backs.

However, what if the economy is in turmoil, with banks making no profits and being unable to convince investors to purchase their shares? Then, the government, or the central bank has to step in and purchase newly-issued shares, as was done during the GFC. An alternative was

apparently used by Crédit Suisse (and other banks) when its own funds were hit by huge defaults on its loan book. The bank grants a loan to an investor who is willing to purchase the newly-issued shares of the bank. Thus, in this case, both sides of the balance sheet of the bank are raised by the same amount, equal to the value of the new shares, thus allowing the bank to fulfill its capital adequacy ratio or to avoid bankruptcy. Werner (2016) concludes from this that "banks in this way created their own capital out of nothing, thus making nonsense of capital adequacy regulations. We learn from this that under the right circumstances it is possible even for an individual bank to show almost any amount of capital to regulators" (p. 375). This was also what an official at the Bank of Canada—Kevin Clinton—told me when I asked him whether the BIS regulations could constrain bank credit.

5.4 A Multiplicity of Interest Rates

I started this chapter by pointing out that some of the earlier disagreements between horizontalists and structuralists arose from the failure to consider an obvious fact—the existence of a multiplicity of interest rates. Thus, while horizontalists used to claim that liquidity preference was a red herring, structuralists would counter that liquidity preference and credit rationing are essential features of a monetary economy that were ignored by horizontalists. These two viewpoints can be reconciled by considering the presence of at least two rates of interest—a short-term rate which is essentially under the control of the central bank, and another rate, which is not. This other rate, depending on the aspects of the economy that need to be analyzed can be either the interest rate set by banks when making loans to their customers, or it could be some long-term interest rate (either the interest rate on government bonds or the interest rate on corporate bonds). About credit rationing, I believe the issue has long been settled: horizontalists have never denied the possibility of credit rationing, in fact they have always mentioned that banks only grant loans to creditworthy borrowers (although this claim became suspicious with the avalanche of subprime loans before the GFC). I have provided much evidence that the horizontalist view was

never extreme whatsoever in this regard (Lavoie 1996). Indeed, Wolfson (1996, 2012) has delivered an illuminating graphical framework that represents credit rationing within a horizontalist view of credit creation. He has a horizontal credit supply curve at a given lending rate for each class of borrowers. Credit rationing is taken into account by considering *two* credit demand curves: a notional demand curve, which reflects the expectations and optimism of borrowers, and an effective demand curve, also called the effective demand curve for credit or the creditworthy demand curve, which corresponds to the confidence of the bankers. The horizontal distance between the notional and effective demand curves at the ruling lending rate is a measure of credit rationing.

Another feature of Wolfson's apparatus is that he distinguishes between two interest rates, the target rate set by the central bank and the bank lending rate. When bankers lose confidence in the future prospects of the economy, and thus show greater liquidity preference, two effects are likely to happen. First, the effective demand curve for credit shifts inwards, thus inducing more credit rationing at a given interest rate. In addition, the bank lending rate rises relative to the target rate. The spread increases as banks impose higher profit margins so as to cover themselves from actual or potential higher default risks. This will induce both a further increase in credit rationing and a reduction in the demand for credit by borrowers. There is thus a possible disconnect between the evolution of the short-term target rate of the central bank and the interest rate which is relevant to non-bank economic agents, which for simplicity we can call *the market rate*, and which could be the bank lending rate or the long-term bond rate. This distinction is certainly useful when entertaining post-Keynesian amendments to the three-equation version of the New Consensus Macroeconomic model, as in Lavoie (2009).

There is a good deal of similarity between this kind of analysis and that of Stiglitz and Greenwald (2003), although they still seem to believe that raising reserve requirements will lead to reduced credit. Assuming that the target rate of central banks is the short-term treasury rate, they noted that "traditional monetary economics focused little on the spread between the T-bill rate and the lending rate" (p. 127). They insisted that "what firms care about is not the rate of interest that the

government pays on its loans, but the interest rates that *they pay*, and the relationship between the two may differ markedly" (p. 125), thus concluding that "because of the increase in spread, the T-bill rate had to be lowered *just to keep the lending rate from rising*" (p. 128). This was particularly evident at the start of the GFC, when interest rate spreads rose considerably, inducing central banks to quickly reduce their target overnight rate. By the way, in this case, standard tests of causality conducted for this period would show that market rates *cause* the overnight rate of the central bank, as advocates of theories based on the natural rate of interest would believe, but the relationship turns out to be negative instead of being positive as required by such theories.

6 Summary and Conclusion

This chapter has focused on ten themes that have been emphasized by post-Keynesian economists and that turned out to have been validated by the events that occurred during and after the subprime financial crisis. In several instances, the post-Keynesian views have been endorsed, implicitly or explicitly by some central bankers. The themes discussed include the theory of endogenous money as it relates to the determination of interest rates by central banks; the necessary defensive role of central banks; the relations between the government and the central bank, as developed by advocates of MMT; the compensation thesis as it applies to an open economy; unconventional monetary policies, mainly quantitative easing, but also some related recent proposals to avoid future financial crises; the question of whether banks are something more than a financial intermediary; the concepts of fictitious and true liquidity; whether the shadow banking sector is akin to the banking sector; the limits to credit creation; and the necessity to consider a range of interest rates.

My conclusion is that post-Keynesian monetary theory has been corroborated. Central bankers ought to be aware of post-Keynesian monetary theory to better understand what they ought to do, and vice versa, the research being carried out by some central bankers should inform post-Keynesians in better formulating their theories.

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