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What analytical framework for Sovereign Money? Some insight from the 100% Money literature, and a comment on criticisms

Abstract

The 2007-2008 Global Financial Crisis has brought renewed interest in the 100% Money reform idea of the 1930s', the essence of which was to require 100% reserves on transaction deposits so as separate money issuance from bank loans. A modern version of this idea, the Sovereign Money proposal, has been much discussed in recent years. Some heterodox economists have harshly criticized Sovereign Money advocates for lacking a clear analytical framework, as well as for disregarding "established" literature on such topics as the causality relationship between money and prices, the accommodation of business needs, financial instability, or the seigniorage privilege. The literature on 100% Money, however, appears to have been largely overlooked by both sides of the debate—even though, as this article shows, it could have brought valuable theoretical insight to the discussion. Building upon the arguments of the 100% Money writers, this paper concludes that many of the criticisms addressed to the Sovereign Money proposal are either inconclusive or misplaced.

Key words: 100% money, Sovereign Money, full reserve banking, endogenous money, financial instability

JEL classifications: B26, E30, E42

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1. Introduction

The Global Financial Crisis (GFC) of 2007-2008 has sparked renewed debates about the functioning of monetary and financial institutions. Many analysts have stressed the key role played by credit (including bank credit) in feeding the 2002-2007 real estate price bubbles in the United States and other countries, the bursting of which endangered their whole financial structure and payment systems¹. Others have pointed out that, because transferable bank deposits today comprise the bulk of means of payment, the deleveraging that followed from the GFC could have resulted in a severe monetary contraction, potentially comparable to that of 1929-1933 in the U.S. Fortunately, the lesson of the Great Depression had been learnt and,

¹ On credit as a recurring factor of price bubbles and financial crises, see, for instance, Schularick and Taylor (2012) and Aliber and Kindleberger ([1978] 2015).

this time, central banks drastically intervened, through “quantitative easing”, to prevent the whole volume of money from falling².

This episode has led a number of economists and central bankers to question the suitability of having the money supply depend on bank-lending activity. As King for example stated:

[T]he fragility of our financial system stems directly from the fact that banks are the main source of money creation . . . In its role as an acceptable medium of exchange, money is not only necessary, it is a social good. . . . Should money be created privately or publicly? . . . [G]overnments [have] allowed the creation of money to become the by-product of the process of credit creation. Most money today is created by private sector institutions – banks. This is the most serious fault line in the management of money in our societies today. (King, 2016, pp. 8, 63, 86)

This type of concern is not new. Already in the 19th century, the recurrence of commercial crises had led the members of the Currency School, in England, to stress the role played by bank money in exacerbating (although not causing) business fluctuations, and to call for divorcing the issuing from the lending of money. The Bank Charter Act of 1844, embodying their views, practically made the issuance of bank notes a monopoly privilege of the Bank of England, to be exercised by a dedicated Issue Department separated from the Bank’s lending business. Other forms of money, however, such as transferable deposits, were left out of the reform. The question of the dependency of money creation upon bank loans came to the foreground again in the context of the 1930s’ Great Depression, after the volume of deposit currency in the U.S. had fallen by a third between 1929 and 1933. Considering this monetary contraction as chiefly responsible for the severity of the depression, a number of economists then proposed divorcing the issuing of the circulating medium (*as a whole*, this time) from banking, by subjecting checking deposits to 100% reserves in state-created (fiat) money. This was the essence of the 100% money (thereafter “100M”) proposal, put forward by the authors of the Chicago Plan—a group of University of Chicago economists led by Frank Knight and Henry Simons³—, as well as Lauchlin Currie of Harvard⁴, Irving Fisher of Yale⁵, and a few others⁶. Under the proposed 100M system, only the monetary authority (the “Currency

² According to Mervyn King, Governor of the Bank of England from 2003 to 2013: “[T]he problem facing the Bank in 2009 was that the amount of money in the economy . . . was actually falling. The reason was that banks had begun to contract their balance sheets . . . If left unchecked, that threatened a depression. . . . The ‘emergency money’ created by the Bank was necessary to prevent a fall in the total money supply” (King, 2016, pp. 181-182).

³ This group included Garfield Cox, Aaron Director, Paul Douglas, Albert G. Hart, Frank Knight, Lloyd Mints, Henry Schultz and Henry Simons. See especially Knight *et al.* ([1933] 1995), Simons *et al.* ([1933] 1994), Simons (1934; 1936) and Douglas (1935). For discussions of the Chicago Plan, see Hart (1935), Whalen (1994), Phillips (1995) and Tavlas (2019). The idea of 100% reserves on checking deposits could already be found, however, in the writings of Charles Carroll ([1860] 1964) in the U.S., Léon Walras (1898) in France, Ludwig von Mises ([1912] 1953) in Austria, or Frederick Soddy (1926) in England.

⁴ See Currie ([1934a] 1968; [1934b] 1968; [1938] 2004), discussed by Hart (1935), Phillips (1995) and Sandilands (2004).

⁵ See especially Fisher ([1935] 1997a), whose 100% plan has been discussed by Allen (1993), Dimand (1993) and Phillips (1995).

⁶ Among the other supporters of 100% money at the time were James W. Angell (1935), Charles R. Whittlesey (1935), Frank D. Graham (1936), Richard A. Lester (1935; 1939, pp. 291-292, 298; 1941) and Friedrich Lutz

Commission” in Fisher’s plan) could create or destroy means of payment, either by way of open market operations or, in cooperation with the Treasury, through the fiscal channel. This proposal, however, was not adopted at the time, and still hasn’t been experimented to this day—although some economists, like Maurice Allais (e.g. 1947; 1987), Milton Friedman (e.g. 1948; 1960) and Hyman Minsky (1994; 1995), have kept supporting it to some point.

In the aftermath of the 2007-2008 crisis, the 100M proposal has aroused renewed interest. It has for example been discussed by researchers of the IMF (Benes and Kumhof, [2012] 2013), central bank economists (e.g. Chari and Phelan, 2014; King, 2016; Baeriswyl, 2017), and a host of academic researchers⁷. At the same time, several new advocates of the reform have proposed to update it somewhat, giving it a new name and a slightly different design. In the United Kingdom, for instance, members of the NGO Positive Money, building upon the work of Huber and Robertson (2000), have put forward a proposal for a “Sovereign Money” (thereafter “SM”) system, very similar in essence to Fisher’s version of the 100M proposal (see, e.g., Jackson and Dyson, 2012; Dyson *et al.*, 2016b). The main difference is that, whereas under 100M, transferable deposits would be matched dollar for dollar by reserves in lawful money, under SM, central bank money *itself* would be directly used, in electronic or scriptural form, by all members of the payment community⁸. This could take the form of a central bank digital currency (CBDC), as Dyson *et al.* (2016b) or Huber (2017) suggest.

This paper is concerned with some criticisms recently addressed to the 100M/SM proposals. This reform idea has been discussed, in particular, in a special issue of the *Cambridge Journal of Economics* entitled “‘Crank’ and ‘Brave Heretic’: Rethinking Money and Banking after the Great Financial Crisis” (Volume 40, Issue 5, September 2016). Fontana and Sawyer (thereafter “F&S”) (2016), on the one hand, and Nersisyan and Wray (thereafter “N&W”) (2016), on the other, argue that the SM proposal is based on many “analytical errors” (F&S, 2016, p. 1335), and that its advocates, therefore, are to be regarded as “monetary cranks” (F&S, 2016, p. 1346; N&W, 2016, p. 1299). The latter are especially criticized for their “disregard of established theoretical literatures” (F&S, 2016, p. 1335)—to be understood here, as Ingham *et al.* (2016, p. 1252) remark, as “heterodoxy” literatures—on such issues as the seigniorage profit, the causality relationship between money and prices, financial instability,

(1936). This reform idea was also advocated in a “Program for monetary reform” first circulated in 1939 by Paul Douglas, Irving Fisher, Frank D. Graham, Earl Hamilton, Willford King and Charles Whittlesey (Douglas *et al.*, 1939), a 1940 version of which further included the signature of John R. Commons (Commons *et al.*, 1940).

⁷ See, e.g., Buchanan (2010), Prescott (2014; with Wessel, 2016), Chiarella *et al.* (2012), or Krainer (2013, 2017). It must be noted, however, that modern discussions often refer to the 100M idea as necessarily involving 100% reserves on *all* bank deposits. Hence the appellation “100% reserve banking”, or “full reserve banking”, frequently given to it. This, however, is a misnomer, as most versions of the proposal would still allow banks to make loans out of fractionally-covered deposits *not* subject to check. Depending on the treatment given to such deposits, fractional-reserve *banking* could still exist under a full-reserve *money* (100M) system.

⁸ This technical change, which represents no fundamental departure from the original 100M proposals, had already been proposed by George Tolley (1962, pp. 299-300): “Let the [checking] deposit liabilities of the commercial banks be transferred to the Federal Reserve banks. If ‘reserves’ are defined in the usual way, as Federal Reserve liabilities connected with deposit money, there would be 100 per cent reserves in the sense that deposit money and reserves would be identical. The physical arrangements in the use of money could be continued as at present, located in the commercial banks with servicing expenses paid for on a contract basis by the Federal Reserve banks.”

or the accommodation of the financing needs of the economy. SM proponents (Dyson *et al.*, 2016a) have provided an answer to the bulk of these criticisms, which has prompted new comments by F&S (2017) and N&W (2017). Further heterodox criticisms of the 100M/SM proposals, echoing these discussions, have been expressed by Dow *et al.* (2015), Dow (2019) and Von der Becke and Sornette (2017), among others.

Speaking of disregarding theory, however, one may be surprised that the literature on 100% money has been largely overlooked on both sides of the debate. The 100M authors of the 1930s, who provided much of the theoretical reasoning for entrusting all power of money creation to the state, are not to be found quoted by the SM proponents even once—although they do acknowledge, in other places, that their proposal was partly “inspired by Irving Fisher’s original work” (Dyson *et al.*, 2016b, p. 1). This might help explain N&W’s reaction that “[t]he response by Dyson *et al.* (2016a) clarifies some matters but lacks a clear analytical framework. . . . [W]e do not find a coherent analytical framework on which to build such a radical policy proposal” (N&W, 2017, p. 1750). To address this concern, this paper will adopt the theoretical framework used by the 100M authors of the 1930s. As we will see, many of the objections addressed to the SM proposal today could have been answered by resorting to this earlier literature, as well as to some more recent works on the topics discussed⁹.

2. Causality relationship between money and prices

One of the “analytical errors” underlying the SM proposal, according to F&S (2016, p. 1335), is the idea that “inflation can be controlled by the rate of increase of the money supply”. From the fact that increases in prices lead, through their effect on bank loans, to increases in bank money, they seem to conclude that the opposite causality, running from bank money to prices, has to be wrong. As they argue: “When input prices and wages rise, more finance is required for production, and that is introduced through bank loans. As a result, the money supply increases. Therefore, the growth of money is caused by the growth of output and prices, rather than the reverse” (F&S, 2016, p. 1336). This denial that bank-created money could influence prices can be traced back to the 19th century Banking School writers, such as Thomas Tooke and John Fullarton, as Lavoie (2014, p. 184) and Vernengo (2006, p. 473)—to whose works F&S refer—remind us. Thus, according to Tooke (1844, pp. 123-124): “the prices of commodities do not depend upon the quantity of money indicated by the amount of bank notes, nor upon the amount of the whole of the circulating medium; but . . . on the contrary, the amount of the circulating medium is the consequence of prices”.

This unidirectional interpretation, under which causality could only run from prices to money, but not the reverse, directly followed from the Banking School’s analysis of the “reflux” principle. Referring to this latter concept, F&S (2016, pp. 1336-1337) note: “Money is being continuously created and destroyed: the provision of bank loans creates corresponding

⁹ A caveat is in order here: it is not presumed that the theoretical framework of today’s SM advocates is necessarily the same as that used by the earlier 100M writers, which may have differed in some respects. On a number of issues, indeed, Fisher and his contemporaries held different (or additional) arguments than those advanced by today’s SM proponents.

bank deposits, and repayment of bank loans eliminates both loans and deposits”. Just like in the Banking School’s case, this consideration leads them to conclude that bank-created money would normally not be issued in excess: “It follows that the amount of outstanding bank deposits in the economy has generally the nature of a residual . . . [t]he size of [which] is generally of little significance” (F&S, 2016, p. 1337).

The Banking School writers, however, conceded that for the reflux mechanism to be really effective, banks should only lend against certain kinds of securities, namely “good commercial bills of usual and reasonable length of date” (Tooke, 1848, p. 197). Otherwise, if advances were made against long-term loans (such as mortgages) or doubtful bills, the reflux would be delayed, and a temporary rise in prices would occur (Tooke, 1844, pp. 157-158; 1848, pp. 193-194, 197; Fullarton, [1844] 1845, pp. 64, 207). Bankers, in other words, should follow the principles of what was later to be termed the “real bills doctrine” (Mints, 1945). N&W, recognizing that “private credit creation may accelerate the boom–bust cycle more than we would like” (N&W, 2016, p. 1312), refer to this doctrine in their reply to Dyson *et al.*, arguing that “[b]anking can be simplified and returned to old-style commercial banking loosely based on the real bills doctrine—with commercial loans financing enterprise, linking the payments system directly to production” (N&W, 2017, p. 1759).

The real bills doctrine, however, has been discarded early on in the literature as an inadequate criterion for guiding money issuance. As Humphrey and Timberlake explain:

[T]he Real Bills Doctrine was flawed from the very start. It failed to distinguish nominal from real output. It linked one nominal variable, the money stock, with another nominal variable, the dollar volume of commercial paper. This characteristic meant that the Real Bills Doctrine could not, by itself, establish any effective limits on either money or prices. (Humphrey and Timberlake, 2020, p. 5; see also Humphrey, 1982, pp. 4-5)

Associated with [this error] is the failure to perceive the two-way inflationary interaction between money and prices that results once money is allowed to be governed by the needs of trade. . . . [This] failure to take account of the price-money-price feedback loop . . . renders the real bills mechanism dynamically unstable. (Humphrey, 1982, p. 4)

Henry Thornton had made similar arguments as early as 1802¹⁰. Today, even Banking School sympathizers, like Goodhart and Jensen (2015, pp. 26-27), recognize that “the real bills doctrine was, unfortunately, wrong. . . . There is, alas, little doubt that a, somewhat slavish, adherence to the ‘real bills’ doctrine by the Fed played a significant role in the intensification of the Great Depression (1929-33)”.

The principle of reflux, therefore, even coupled with reliance upon a guiding principle such as the real bills doctrine, offers no guarantee that bank money will not be over-issued during booms, and over-contracted during depressions, as it fails to take account of the reciprocal

¹⁰ See his criticism of the real bills doctrine (Thornton, [1802] 1939, pp. 86, 227, 244), and his explicit recognition of the reciprocal causality relationship between paper money and prices (*ibid.*, pp. 198, 237-238, 256). In an 1811 speech, he thus discarded the idea of supplying paper money “to as many borrowers as should think fit to apply”, because this would mean forgetting “that there might be no bounds to the demand for paper; that the increasing quantity would contribute to the rise of commodities: and the rise of commodities require, and seem to justify, a still further increase” (Thornton, [1802] 1939, pp. 341-342).

(and hence pro-cyclical) character of the causality relationship between bank-created money and prices.

This pro-cyclical pattern, ignored by the Banking School, underlay the Currency School's proposals for divorcing the issuing from the lending of paper money, which would be implemented under the English Bank Charter Act of 1844¹¹. A major inconsistency of the Currency School's analysis, however, which their Banking School opponents rightly pointed out, was its exclusive focus on bank notes to the exclusion of other means of payment, such as transferable deposits or endorsable bills of exchange, which they refused to regard as money.

This inconsistency would be addressed by the 100M authors, who, in the 1930s, offered to divorce the issuing of the circulating medium *as a whole* (including deposit currency) from bank-lending activity. Their reasoning was based on Fisher's equation of exchange, $MV = PT$, in which M denotes the volume of means of payment, V their velocity of circulation, P the general price level, and T the real volume of trade. The creation of money out of loans, these authors argued, would lead to fluctuations in M and in V , which would intensify price-level fluctuations and booms and depressions of trade (i.e. changes in P and T), themselves bringing further changes in M and V , and so on and on. Under their proposed 100M reform, the use of final means of payment other than lawful money (or transferable deposits fully backed by lawful money) would be prohibited by law¹². In this way, cumulative interactions between loans, deposit currency and prices, which a system of bank-created money (in Fisher's words, a "10% system") would produce, would be prevented from occurring. As Fisher argued:

[W]e ought to know that one of the chief reasons why changes in business bring about changes in the price level is the 10% system. . . . For, under the 10% system it is true, as we have seen, that an increase in business, by increasing commercial bank loans, and so increasing the circulating medium, tends to raise the price level. And, as soon as the price level rises, profits are increased and so business is expanded further. Thus comes a vicious circle in which business expansion and price expansion act each to boost the other — making a "boom". Reversely if business recedes, loans and prices also recede, which reduces profits and so reduces business volume — again causing a vicious circle, making a "depression". But, take away the 10% system and you take away these unfortunate associations between business and the price level. (Fisher, [1935] 1997a, p. 181)

Hence, whether or not one agrees with this analysis, the 100M proposal cannot be said to assume that, *under the existing monetary system*, "the demand for loans of households and businesses is completely irrelevant for the determination of the quantity of money", in the words of F&S's criticism of today's SM proposal (2016, p. 1336). Quite on the contrary, its very purpose was to allow money creation to *become* independent from such demand. As

¹¹ The Currency School's case for separating these two functions was further motivated by their distrust of the discretionary power of the Bank's directors. For a comparative analysis of the Currency School's reform proposals and the 100M plans of the 1930s, see Demeulemeester (2021).

¹² "Lawful money" is here to be understood as state-created money, taking either a paper or scriptural form—i.e. checking account balances held on the books of the monetary authority. The latter would typically hold Government securities (newly issued if need be) against its monetary liabilities.

Laidler (1999, p. 330) reminds us, in the early decades of the 20th century, “endogenously driven variations in the money supply” played an important role in the cycle theories of a great many economists, including the ones discussed here. Precisely following from such analyses, the 100M proposal sought to put an end to the whole prices-to-loans-to-money causality chain, by setting up a new system under which variations in the level of prices and in the demand for loans could no longer directly impact the amount of circulating medium. Under the proposed 100% scheme, “all new money [would be] ‘spent into existence by the state instead of, as at present, being lent into existence by private companies’” (Fisher, letter to Roosevelt, May 14, 1937, in Fisher, 1997b, p. 170). Variations in the stock of money could only be brought about by the monetary authority, acting in accordance with its policy objective (more on this below).

Dyson *et al.* (2016b, pp. 10, 13), however, while also denouncing the pro-cyclicality of bank money creation, are less adamant than their 1930s’ predecessors that money issuance should be made independent of borrowing and lending decisions. They suggest that “the optimal system is probably one in which lending to businesses can be accommodated with the creation of new money by the central bank, but all other lending would be funded out of existing savings” (Dyson *et al.*, 2016a, p. 1357). In contrast, the earlier 100M proponents would not have had money issued by way of loans at all, even by the central bank itself¹³.

3. Accommodating the monetary and financial needs of the economy

Another major shortcoming of the SM proposal, according to F&S (2016, p. 1339), is that it shows an inherent “deflationary bias”¹⁴. At first sight, one would think this relates to a concern that the volume of money, under a 100M/SM system, would not grow sufficiently or flexibly enough to accommodate a growing volume of transactions. In this regard, Dyson *et al.* argue that:

As long as the central bank has an inflation/employment target, then it would always increase money creation (and therefore spending) whenever inflation/employment was below target; deflation due to insufficient aggregate demand would never be a problem. The argument that there will be an “inherent deflationary bias” . . . is therefore not supported. (Dyson *et al.*, 2016a, p. 1357)

A similar point was made by the 100M writers in the 1930s—except that, in their case, it was clear that employment in itself would not be an appropriate direct target for monetary policy, but rather an indirect (or ultimate) one, to be best attained if money adequately fulfilled its role of standard of value. This is why Fisher ([1935] 1997a, pp. 96-97), among others, advocated stabilizing an index of the cost of living, through adequate management of the

¹³ The only exception here was Currie ([1938] 2004, p. 361). It is worth noting that it was already recognized, at this time, that, under the *existing* system, central bank money itself could be endogenously created. As Fisher for example remarked: “A member bank may create a part of its reserve by ‘rediscounting’” ([1935] 1997a, p. 51).

¹⁴ This seems to echo the reply made long ago by Keynes to Fisher, after the latter had tried to “sell” him his 100M plan in 1944: “I am afraid of your formula because I think it would, certainly in England, have a highly deflationary suggestion to a great many people” (Keynes, letter to Fisher, July 7, 1944, in Fisher, 1997b, p. 219). Keynes unfortunately never seems to have answered Fisher’s next letter inviting him to elaborate on his reservations (Fisher, letter to Keynes, September 8, 1944, in Fisher, 1997b, pp. 219-220).

money supply¹⁵. A 100M system, he insisted, would in no way prevent the monetary authority from putting more money into circulation whenever needed: “If money became scarce, as shown by a tendency of the price level to fall, more could be supplied instantly; and if superabundant, some could be withdrawn with equal promptness. The adjustments would be smaller than are now necessary and the stabilization would be more precise” (Fisher [1935] 1997a, p. 108)¹⁶. He further suggested that the Currency Commission monitors as broad a range of indicators as possible, so as to detect any threat of price-level disturbance at the earliest and adjust the money supply accordingly (*ibid.*, pp. 110-111).

However, F&S’s concern about a “deflationary bias”, as they explain (F&S, 2017, p. 1747), does not seem to relate to the risk of an insufficient volume of *means of payments*, but rather to that of an inadequate volume of *savings* to finance investment. It is true that, under a 100M or SM system, as money would no longer be created out of loans, investment could only be financed out of prior savings, with banks becoming mere financial intermediaries between savers-lenders and enterprisers-borrowers. This leads F&S to argue, in respect to the savings decision process: “At every round there will be leakages (e.g. hoarding cash), with the result that over time the fixed amount of prior savings that under [SM] banks can transfer to borrowers is increasingly reduced”, hence a “tendency towards deflation or recession” (F&S, 2016, p. 1339). N&W (2016, p. 1311), making a similar case, argue that “[i]f we really did limit our finance to saving and our loans to deposits, then we would run our economy into the ground”.

Dyson *et al.* (2016a, pp. 1356-1358) have answered this criticism to some point. Their reply, however, overlooks one obvious answer to this question, to be found in the 1930s’ literature. What would happen if, under a 100M (or SM) system, there suddenly was a shortage of savings? According to Fisher:

[I]f there is a big demand for loans and a small supply of capital to lend, the price (that is, the interest rate) will go up — as it should. In fact, one fault of the present system is the artificiality of the rate of interest. It is fundamentally wrong to have an interest rate which cannot work both ways, according to proper supply and demand; and it is largely our illogical monetary system . . . which prevents this today. (Fisher, [1946] 1997a, p. 310)

¹⁵ See also Douglas *et al.* (1939, p. 16): “[T]he ultimate object of monetary policy should not be merely to maintain monetary stability. This monetary stability should serve as a means toward the ultimate goal of full production and employment and a continuous rise in the scale of living. . . . Essentially, however, the purpose of any monetary standard is to standardize the unit of value To furnish a dependable standard of value should therefore be the only requirement of monetary policy.” There could be a deflationary tendency, of course, if it was instead decided to adopt a rigid monetary policy rule, such as that of keeping the money stock constant (as was actually advocated by Simons up to a point). The choice of a monetary policy criterion, however, is entirely independent of the 100M (or SM) reform *per se*.

¹⁶ Of course, one limitation of commodity price indexes lies in their overlooking of asset price bubbles. It is arguably a major shortcoming of bank-created money, however, that it necessarily enters into existence *where the banks lend*—meaning, nowadays, essentially on financial or housing markets. One advantage of a 100M (or SM) system, in this regard, lies in the possibility of injecting money much more evenly throughout all sectors of the economy. This would still depend, of course, of the chosen injection channels. Money issued through tax credit or lump sum payments to citizens, for example, could reach all economic agents at once, but the same cannot be said of open market operations. See Baeriswyl (2017) for a discussion of this issue.

Under the existing “10%” system, Fisher ([1935] 1997a, p. 139) argued, because of the dependency of the money supply upon bank loans, the monetary authority has to “manipulate” the price of the loan market (the interest rate) so as to prevent inflation or deflation. Under a 100% system, on the other hand, with money creation divorced from loans, the monetary authority would no longer need to rely upon banks to increase or decrease the amount of circulating medium, thus allowing for unhampered interest rates:

Interest rates would seek their level in a natural way according to the supply and demand of loans. . . . [T]o restore to the rate of interest its proper significance and its function of clearing the loan market would be one of the merits of the proposed 100% system. (Fisher, [1935] 1997a, pp. 140, 145-146)¹⁷

In other words, as the money stock and the rate of interest would be determined independently from one another, both could reach their optimal equilibrium level at the same time. While a decrease in the price-level index would signal (to the monetary authority) that more money was needed in the circulation, a rise in the rate of interest would signal (to potential savers/lenders) that more savings were needed. In either case, nothing would prevent the required supply from being provided¹⁸. On top of that, as argued by Dyson *et al.* (2016a, p. 1357), if nevertheless “there ever is a shortage of credit to the real economy, the central bank always has the option of making funds available to banks (and non-bank lenders) to finance lending to businesses”. This latter option, however, was not favored by the 100M writers, except possibly “as a safety valve in cases in which the banks could not themselves readily afford accommodation in sufficient volume or with sufficient promptness” (Fisher, [1935] 1997a, p. 88). It remains that, for all the above reasons, the claim that a 100M or SM reform would lead to a shortage of loanable funds is clearly not warranted in theory—not, at least, insofar as the theoretical framework underlying the 1930s’ 100M plans is concerned.

Now, what of the claim made by N&W (2016, p. 1312) that “[p]rivate creation of money is more elastic in the sense that it is better able to respond to the needs of the economy”? The 100M writers actually held that, because of the cumulative interactions between bank loans, bank money and prices, the existing monetary system offered a “perverse elasticity” (Currie, [1934a] 1968, pp. 130-131; see also Simons *et al.*, [1933] 1994, p. 31). What was needed, Fisher ([1935] 1997a, p. 177) argued, was “a more genuine matching of money and business than the debt-deposit tie-up can ever give us”. He went on: “Under the 100% system, combined with a stable money policy, money would *really* be gauged to accommodate business, expanding as business expands *but no faster* — constituting a true elastic currency” (*ibid.*, p. 181, italics in original).

¹⁷ Dyson *et al.* (2016b, p. 30) do note that, under a SM system, the interbank rate “would be determined by the market rather than the central bank’s policy rate, which would have ceased to exist”. Yet, they fall short of remarking that freely market-determined interest rates would allow the supply of savings to adapt to the demand, thus providing a spontaneous response to any shortage of loanable funds.

¹⁸ Crucially, under a 100M system, a rise in interest rates would no longer result in a decrease in the circulating medium, as tends to be the case with bank-created money. Nor would a decision to increase the money stock require any reduction in interest rates.

Interestingly, while praising the “elastic” character of bank-created money, N&W also acknowledge its lack of elasticity in depression times, noting that relying on bank loans “works only if there is an unmet demand for loans, because you cannot push on a string . . . You can lead that borrower to the water, but you cannot make her drink if she’s not thirsty” (N&W, 2017, p. 1756). This very same argument was actually used by Fisher *in support* of the 100M system, when he remarked, in respect to the Great Depression:

Open market operations . . . have been tried for the purpose of reflation; but the only large effect has been to . . . supply the member banks with “excess” reserves which they either would not use (because they were afraid to lend) or could not use (because merchants would not borrow). . . . Finally the Government stepped in and itself went deeply into debt with the banks. Such must often be our predicament so long as we have a system under which our circulating medium is a by-product of private debt. The time when nobody wants to go into debt is the very time when we most need money and so most hope that somebody will kindly accommodate us by going into debt. Few will do so . . . despite the low rates of interest. It is a case of leading a horse to water without being able to make him drink. Or it is like “pushing on the lines” to make the horse go. . . . Under the 100% system there would be no such “slack”. (Fisher [1935] 1997a, pp. 104-105, 108)

Finally, a word may be said about F&S’s reference to “the work of Minsky and other Post Keynesian economists”, which leads them to stress that “the creation of money through the lending activity of banks is essential in order to accommodate the financing needs of capitalist economies” (F&S, 2016, p. 1340). N&W (2016), Dow *et al.* (2015), Dow (2019) and Von der Becke and Sornette (2017) similarly build on Minsky’s analysis when rejecting the 100M/SM idea. But at no point do these authors mention that, in his latest writings, Minsky himself came to endorse the idea of a 100M system, holding, for example:

[A]s the 21st century is about to be ushered in, an idea which was on the table during the 1930’s discussion of reform can once again be on the table. One virtue of the 100% money scheme is that it separates the two functions that the monetary and banking system has to perform: the provision of a safe and secure means of payments, and the capital development of the economy. (Minsky, 1994, pp. 20-21)

Again, in another paper:

For the United States 100% money is now feasible. . . . [I]n the light of our experience during the late 1980’s and early 1990’s a more meaningful reorganization of banking could be undertaken . . . by reviving the deep reforms embodied in 100% money . . . By eliminating the link between the money supply and the performance of private liabilities such reforms could dampen, even as they cannot eliminate, the instabilities inherent in a market economy that follow from the linking of the quantity of money and the financing of activity to the performance of private liabilities. (Minsky, 1995, p. 13)

This begs the question, of course, whether Minsky himself should then be considered as a “crank” according to some of his followers’ own criteria¹⁹.

¹⁹ Kregel (2012, p. 7) has argued that “Minsky eventually gave up his support for narrow banking” (to be understood here as synonymous to 100% money), but without providing any reference in support of this claim.

4. Monetary versus financial stability, and the “boundary problem”

Another major criticism addressed to the SM proposal is that, by exclusively focusing on checking accounts, such reform ignores all other sources of financial instability, such as those related to savings accounts or to non-bank financial intermediaries, including the “shadow banking” sector²⁰. Dyson *et al.* (2016a, pp. 1358-1359) have answered this criticism in some detail. What did the 1930s’ 100M advocates have to say on this matter? Their positions actually sharply diverged, and two groups of authors are to be distinguished in this respect²¹.

A first group, especially comprising Currie and Fisher, focused their case on *monetary* instability strictly speaking. Their objective, above all, was to put an end to the cyclical variations in the *volume of means of payment* caused by the cumulative interplay between bank loans, bank money and prices. Accordingly, they would only take away from the banks their strictly monetary power, by subjecting *transferable* (“checking”) deposits to 100% reserves. In addition to preventing unwanted fluctuations in the amount of circulating medium, such reform, they held, would *de facto* make the payment system perfectly safe. But, far from showing a “blind fascination with the safety and security of the payment system”—in the words of F&S’s (2016, p. 1347) criticism of Dyson *et al.* in this respect—, they regarded this latter advantage as less crucial than the former. As Fisher (1937, p. 296) made clear: “[S]afeguarding depositors is of secondary importance. If that were all, the 100 per cent. plan would scarcely be worth writing about, especially as to-day deposits are safeguarded in other ways [such as] deposit insurance”. What really mattered to Currie and Fisher was preventing the medium of exchange from being itself an amplifying factor of booms and depressions. They did not further suggest any drastic reform of *financial* (i.e. money lending) institutions: under their reform plans, these would remain mostly untouched, barring the fact that they could only lend or invest pre-existing money, not created for the purpose. Commercial banks, in particular, could still make loans out of fractionally-covered savings deposits—as long as those were not transferable by check—and provide risk and maturity transformation. These authors were aware that such reform would not entirely do away with financial instability or business fluctuations:

The 100% system would be no cure-all for business fluctuations though it would help reduce them. . . . [I]t would afford no guarantee that loan banks and savings banks would be completely immune to runs and failures, nor that any such immunity would be enjoyed by investment houses, building and loan associations, insurance companies, commercial

There seems to be no evidence that Minsky, who did occasionally express reservations about 100% money *prior* to 1994-1995, ever discarded this idea *afterwards*. His growing interest in the scheme in his later years obviously had to do with the fact that Ronnie Phillips was then conducting his research on the Chicago Plan at the Levy Institute. As Phillips recounted to the present author in private correspondence: “I had an office next to his at the Levy Institute for two years. From [the outset], Minsky was very interested in and knowledgeable about the 100% plan. I talked with him a lot about it and he read my early drafts.” Minsky wrote a foreword to Phillips’s book (in Phillips, 1995, pp. xi-xiv).

²⁰ See, for example, F&S (2016, p. 1338), N&W (2017, pp. 1752-1754) and Von der Becke and Sornette (2017).

²¹ For a detailed comparison of the two following approaches, see Demeulemeester (2018).

concerns, railways or any other persons or corporations except the checking banks. (Fisher, [1935] 1997a, p. 216)

Their point, again, was not that all *financial* instability should (or could) be eliminated, but rather that *monetary* instability (fluctuations in the circulating medium) should not itself fuel the cycle. The 100M reform, moreover, would not preclude adopting financial reforms in complement if need be—as Fisher put it:

What is important, the 100% system would make it easier to study all these other problems, uncomplicated by the money problem which now envelopes them as in a fog. . . . As soon as we get a good monetary system we can more safely determine what else needs mending. To be able thus to see more clearly, and to diagnose more correctly, would be a powerful aid to all efforts to find and apply effective remedies. These might include safeguards for savings banks, regulation for security issues, [etc.]. (Fisher, [1935] 1997a, pp. 216-217)

Another group of authors, however, especially comprising the Chicagoans led by Simons, insisted that any reform dealing solely with the supply of means of payment—what they called “effective money” (*M*)—would prove insufficient in any case. In contrast to Currie and Fisher, they focused as much on monetary as on financial instability—or, rather, on the instability of “money” defined in a much broader way, encompassing not only *M* but also all kinds of liquid assets easily convertible into means of payment (i.e. “near moneys”), such as savings deposits or short-term claims of all sorts. Variations in the volume of these, they held, would greatly exacerbate the changes in the velocity of circulation (*V*) of “effective money”. Therefore, on top of reforming the strictly monetary system, these authors further called for drastic reforms of the financial system at the same time. The 1933 Chicago Plan already proposed, in addition to 100% reserves on checking accounts, to replace loan banks with investment trusts. Simons (1936; 1946) would even go much further in his later individual works, suggesting that all kinds of short-term debt contracts (and eventually all debt contracts except consols) be forbidden, so that the funding of businesses could only take the form of equity financing. He actually did address to Currie and Fisher the same kind of criticism as that made today by F&S and N&W about SM, insisting that “any reform which dealt merely with demand deposits and checking accounts might largely fail to accomplish the results intended” (Simons, 1934, p. 38n7).

Subsequent 100M supporters have followed either of these two approaches. The SM proponents, for their part, tend to follow Currie and Fisher in solely focusing their case on the supply of means of payment—although Dyson *et al.* (2016b, p. 22) do suggest reforming financial institutions to some extent. This line of authors has often been criticized for supposedly ignoring the risks associated with savings banks or non-bank financial institutions. It must be recalled, however, that such a “minimalist” approach to the 100M/SM proposal—to *fully* insulate the issuing of circulating media from bank-lending activity, while leaving financial institutions mostly untouched—has never been given a try, and does not prevent adopting further financial reforms at a later stage (or separately) if needed.

F&S (2016, p. 1338), however, do not simply argue that the SM proposal would fail to reduce financial instability; they further hold that it is likely to *increase* it. They base this

claim on the “boundary problem in financial regulation”, a concept developed by Charles Goodhart, according to which the differential between a regulated and an unregulated financial sector is itself a destabilizing factor. As Goodhart (2008, p. 49) explains: “The combination of a boundary between the protected and the unprotected, with greater constraints on the business of the regulated sector, almost guarantees a cycle of flows into the unregulated part of the system during cyclical expansions with sudden and dislocating reversals during crises”. This boundary problem, however, does not apply to the 100M/SM proposals, but rather to another kind of reform idea, namely, the *narrow banking* proposal, which was explicitly targeted by Goodhart in his paper.

The 100M/SM proposals, on the one hand, offer to separate the issuing of money, as well as its keeping-and-transferring, from the sphere of finance (the lending of money). More specifically:

- (i) The *issuing* of money would be exclusively vested in a public monetary authority.
- (ii) The *keeping-and-transferring* of money (from one checking account to another) would be administered by non-lending institutions, namely check banks (or check departments within banks). These would not own, and not be allowed to lend, the money kept on checking accounts by their holders²².
- (iii) The *lending and investing* of money would be performed by financial intermediaries, including loan banks (or loan departments within banks). Funds collected through savings accounts would become part of the bank’s asset portfolio, which it would be free to lend or invest. No creation of money would be involved, as the balances of savings accounts could not be used as means of payment by savings depositors.

Such reforms, however, would *not* involve applying different regulations to lending institutions depending on the nature of their asset portfolio. In other words, while the issuing of money and the payment system would be separated from the financial (lending) sector, the financial sector itself would not have to be split into a regulated and an unregulated part—which is why the “boundary problem” does not apply here.

Narrow banking, on the other hand, offers to split *lending institutions* into different categories²³. One such category would be a “narrow bank”, which could invest its depositors’ money (or “create” money balances) by acquiring *safe* investment assets, such as Government

²² As Fisher ([1935] 1997a, p. 10) explained: “The checking deposit department of the bank would become a mere storage warehouse for bearer money belonging to its depositors . . . There would then be no practical distinction between the checking deposits and the reserve.” See also Simons *et al.* ([1933] 1994, p. 4). On the technical differences between SM and 100M on this matter, see the introduction *supra*.

What about transfers between checking accounts and savings accounts? Under a 100M system, these would amount to transferring money between the checking accounts respectively owned by savings depositors and the banks themselves. As Fisher ([1935] 1997a, p. 69) specified: “The loan department . . . would deposit its own cash in the check department and would transfer it by check just like any other depositor”. That is, only checking account units would be *money* and circulate. Savings account units would only be *promises to pay money* and could not be transferred by check. This could be pictured even more clearly if checking accounts units were replaced by digital cash, as suggested under some SM proposals.

²³ Examples of narrow banking proposals include Tobin (1985; 1987), Kareken (1986) and Litan (1987).

bonds. Only this category of bank could offer its depositors checking facilities. The other categories could invest in riskier assets, but could not offer checking facilities. In this case, a differential of regulation would exist between different parts of the financial sector, and the “boundary problem” might apply. It may also be noted that narrow banks, in contrast to check banks under the 100M/SM proposals, would still be able to create/destroy means of payment when acquiring/selling (safe) investment assets. For these reasons, 100% money and narrow banking should not be confused, as is often the case.

5. Bank money and seigniorage

Yet another controversial issue surrounding the 100M/SM proposals relates to their claim of returning all seigniorage profit to the state. F&S and N&W reject this claim by contesting the very idea that commercial banks, owing to their ability to create money, are endowed with any kind of “seigniorage” privilege in the first place—supposing so, they held, is an “analytical error” (F&S, 2016, p. 1335) demonstrating “misunderstanding of banking” (N&W, 2017, p. 1757). According to F&S:

Graziani (2003, pp. 58–66), among others, has explained that no agent involved in the loans supply process has a seigniorage privilege: not businesses, not households, and certainly not commercial banks. The profits of commercial banks come from the difference between the rate of interest on loans . . . and the costs of deposits . . . This would hold whether loans create deposits, as in the endogenous money view where commercial banks create money out of nothing, or deposits create loans, as would be the case under the [SM] proposals. (F&S, 2016, p. 1335)

They thus liken the SM proposal to the idea that “deposits create loans”²⁴. This is not strictly true. If “deposits” are here to be understood as *checking* deposits, usable as means of payment, then the banks, if allowed to lend out the cash deposited on checking accounts, are still creators of money, even though this is a case where “deposits make loans”. Here the old textbook “money multiplier” model applies, according to which the amount of bank-created money (in the form of transferable deposit balances) is a multiple of cash reserves. The 100M/SM proposals, on the other hand, more specifically imply that *savings* deposits make loans—that is, savings accounts the balances of which are *not* transferable, so that the amount of circulating medium is no longer affected by the process of collecting savings and making loans.

So, the relevant question, insofar as seigniorage is concerned, is whether there is any difference between a system under which banks create money (regardless of whether checking deposits make loans, or loans make checking deposits), and one under which they do not (and only *savings* deposits can make loans). There obviously is. Checking deposits, because they can be used as means of payment, usually do not bear interest. In this case, the difference between interest received on loans and interest paid on deposits amounts to the difference

²⁴ Moreover, Graziani, in the passage referred to by F&S above, does not appear to provide any detailed explanation of why bank money creation would not give rise to a seigniorage profit. Graziani (2003, p. 61) himself refers to a book passage by De Vecchi (1995, chapter 5, §1), in which no such explanation is to be found either.

between the former and zero, and the resulting profit margin, attributable to the banks' ability to create money, may be regarded as a form of seigniorage.

In the literature, it is thus usual to measure the seigniorage profit stemming from the issuance of a credit currency, during any given time period, as: $S = iM_C$, where S is the seigniorage gain, M_C the outstanding volume of credit currency (i.e. currency issued by way of loans), and i the risk-free rate of interest applied during this period (see, for example, Buiter, 2007, p. 3; Walsh, [1998] 2010, p. 139; or Reich, 2017, p. 82). Most of these authors, it is true, restrict their analysis to the issuing of credit currency by the central bank, without explicitly considering the case of commercial banks. But there is no reason, of course, why the same reasoning should not apply to bank-created money at large—as argued, for instance, by Baltensperger and Jordan (1997), Bossone (2001; 2021) or Bibow (2018, p. 6)²⁵. As Goodhart (1988, p. 21, italics in original) also insists, in respect to bank notes: “Even when private note issues are *not* legal tender, the issuers obtain seigniorage, i.e., the margin between the rate of interest, generally zero . . . on the notes and the interest on the (default-free) assets held by the private note issuers against such note liabilities.”

Now, does this mean that, in the existing system, the banks are able to keep all the profit stemming from this money creation for themselves? On the contrary, the 100M advocates rather insisted that, in a situation of competition, commercial banks are pressured to transfer the bulk of this seigniorage profit to their customers, so as to increase (or protect) their market share. They can do so by offering free administration services (to checking account holders), higher interest rate remuneration (to savings account holders) or lower interest charges (to borrowers). As Fisher ([1935] 1997a, p. 155) thus noted: “The really big profit was squeezed out long ago. The very effort, under competition, to get that profit has reduced it — by offering interest on deposits and otherwise.” The seigniorage that would be gained by the state should a 100M (or SM) system be adopted, therefore, would not simply be taken away from the banks, but rather from bank customers at large (to the extent, again, that competitive conditions do prevail in the banking industry). Part of it could be returned to checking depositors in the form of free account-management services, if, as many 100M authors suggested, the state were to pay the banks a subsidy to cover these costs. The rest could be used for other purposes, such as reducing the public debt.

The claim that any public debt reduction might follow from a 100M reform has been criticized at length in the literature (see Demeulemeester, 2020), but never before, to the present author's knowledge, on the ground of a denial that bank money creation would give rise to a kind of seigniorage privilege (benefiting the banks and/or their customers) in the first place.

6. The question of monetary substitutes

In addition to the theoretical issues discussed above, it is often argued that a 100M or SM reform could not be enforced in practice, because banks (or other financial institutions) would

²⁵ Of course, in the case of commercial banks, M_C in the above equation would only denote the volume of bank money not covered by reserves.

always find ways to develop alternative means of payment, even should this be prohibited by law²⁶. F&S, for example, hold that banks would have to charge “significant” administrative fees for managing transaction accounts (as these could no longer be used to make loans), providing them and their customers with a strong incentive to make other kinds of accounts transferable for payments (F&S, 2016, p. 1341; 2017, p. 1744). Many versions of the 100M/SM proposal, it is true, have suggested that banks apply a small service charge to cover management costs (see, e.g., Fisher, [1935] 1997a; Dyson *et al.*, 2016b, p. 21)—not a “significant” one, however, and there is probably some truth in Dyson *et al.*’s statement that “[i]n any case, competition in the market, especially from newly-emerging financial technology (fintech) companies, should help to keep account fees as low as possible” (2016b, p. 21). The risk that such fees could lead to the development of monetary substitutes, for all that, cannot be wholly discarded—as a matter of fact, it was already discussed and addressed in the 1930s’ literature, for example by Hart (1935, p. 114). After noting that “to some extent repressive measures . . . might serve to keep down such practices”, the latter added:

But undoubtedly the most effective measure would be to ensure that the use of cheques remained, as at present, cheaper and more convenient than alternative modes of settlement. Under [one kind of] proposal (administration of chequing accounts by government) this could be done directly. Under [other 100% schemes], however, it would require a subsidy to bankers who carried chequing accounts, on such a basis as to prevent the growth of service charges to a point which would discourage the use of cheques. (Hart, 1935, p. 114)

Fisher also considered the option of paying the banks a subsidy, as an alternative to service charges: “Or the cost might well be borne, in whole or in part, by the Currency Commission on the same principle of public service which has resulted in removing ‘brassage’ charges at the mint and substituting gratuitous coinage at the expense of the government” (Fisher, [1935] 1997a, p. 153n1). It is no necessary consequence of the 100M/SM reform, therefore, that higher fees would result for checking depositors.

The risk that alternative means of payment would develop under a 100M/SM system cannot be completely ruled out, for sure, until such a reform has been experimented. But it cannot be ruled out either that, should central bank money become universally accessible in a digital form, no substitutes would tend to develop *even if allowed to*. A CBDC, indeed, would likely provide a medium of exchange fully-secured, free of charge, and most convenient to use. Suppose that, in addition, the state decides to reduce (if not eliminate) its guarantee of bank deposits, which so largely contributes to their being commonly accepted as a means of payment today. Isn’t it conceivable at least that, in such a case, even *without* prohibiting the use of bank money or other private circulating media, the public ends up accepting only (or mostly) central bank money in transactions? It actually is a source of concern for some economists, whether introducing a CBDC might not eventually result in a *de facto* 100M/SM

²⁶ As Dyson *et al.* (2016, p. 1358) recall, the question of substitutes to money *as a means of payment* should not be confused with that of substitutes to money *as a store of value*. This section is only concerned with the first. About the second, see Section 4 *supra*.

system, even though bank money remained perfectly allowed to circulate (see, e.g., Tolle, 2016). To this kind of question, again, only experimentation could provide a definite answer.

7. Conclusion

The Sovereign Money proposal has been heavily criticized by some heterodox economists for lacking a coherent theoretical framework, as well as for disregarding the supposedly “established” literature on such issues as the causality relationship between money and prices, the accommodation of business needs, the seigniorage revenue, or financial instability. Those holding these criticisms have not hesitated to call “cranks” the advocates of this proposal, who, from Fisher to Minsky, comprise many prominent figures in the history of the discipline. The long-standing theoretical case in favor of the SM proposal, however, has been surprisingly overlooked in this debate, even by the SM authors themselves. This paper has shown that the 1930s’ literature on 100% money, in particular, could bring valuable insight to current discussions. It has also confirmed Dyson *et al.*’s (2016a) conclusion that many of the criticisms addressed to the SM proposal were either inconclusive or misplaced.

References

- Aliber, Robert Z. and Charles P. Kindleberger. [1978] 2015. *Manias, Panics and Crashes: A History of Financial Crises*. 7th ed., New York, NY: Palgrave Macmillan.
- Allais, Maurice. 1947. *Économie et intérêt*. Paris : Librairie des publications officielles.
- Allais, Maurice. 1987. “The Credit Mechanism and its Implications”, in *Arrow and the foundations of the theory of economic policy*, edited by George R. Feiwel, pp. 491–561. New York, NY: New York University Press.
- Allen, William R. 1993. “Irving Fisher and the 100 Percent Reserve Proposal”. *Journal of Law and Economics* 36 (2): 703–717.
- Angell, James W. 1935. “The 100 Per Cent Reserve Plan.” *The Quarterly Journal of Economics*. 50 (1): 1–35.
- Baeriswyl, Romain. 2017. “The Case for the Separation of Money and Credit”, in *Monetary Policy, Financial Crises, and the Macroeconomy*, edited by Frank Heinemann, Ulrich Klüh and Sebastian Watzka, pp. 105–121. Cham: Springer International Publishing.
- Baltensperger, Ernst and Thomas J. Jordan. 1997. “Seigniorage, banking, and the optimal quantity of money”. *Journal of Banking & Finance* 21 (6): 781–796.
- Benes, Jaromir and Michael Kumhof [2012] 2013. “The Chicago Plan revisited”. (IMF Working Paper WP/12/202, International Monetary Fund, revised draft).
- Bibow, Jörg. 2018. “Unconventional Monetary Policies and Central Bank Profits: Seigniorage as Fiscal Revenue in the Aftermath of the Global Financial Crisis” (Working Paper No. 916, Levy Economics Institute of Bard College and Skidmore College, October 2018).
- Bossone, Biagio. 2001. “Do banks have a future? A study on banking and finance as we move into the third millennium”. *Journal of Banking and Finance* 25 (12): 2239–2276.
- Bossone, Biagio. 2021. “Commercial bank seigniorage and the macroeconomy”.

International Review of Financial Analysis 76: 1–15.

- Buchanan, James M. 2010. “The Constitutionalization of Money”. *Cato Journal* 30 (2): 251–258.
- Buiter, Willem H. 2007. “Seigniorage” (Working Paper 12919, NBER Working Paper Series, National Bureau of Economic Research).
- Carroll, Charles H. [1860] 1964. “Mr. Lowell vs. Mr. Hooper on Banking and Currency”, in *Organization of Debt into Currency and Other Papers*, by Charles H. Carroll, edited with an introduction by Edward C. Simmons, pp. 202-218. Princeton, NJ: D. Van Nostrand. Reprinted from *Hunt’s Merchants Magazine and Commercial Review* XLII (May, 1860): 575-585.
- Chari, V. V. and Christopher Phelan. 2014. “On the Social Usefulness of Fractional Reserve Banking”. *Journal of Monetary Economics* 65: 1–13.
- Chiarella, Carl, Peter Flaschel, Florian Hartmann and Christian R. Proaño. 2012. “Stock market booms, endogenous credit creation and the implications of broad and narrow banking for macroeconomic stability”. *Journal of Economic Behavior & Organization* 83 (3): 410–423.
- Commons, John R., Paul H. Douglas, Irving Fisher, Frank D. Graham, Earl J. Hamilton, Willford I. King and Charles R. Whittlesey. 1939. “A Program for Monetary Reform” (dated August 1940, unpublished, Fisher Papers, Yale University Library).
- Currie, Lauchlin B. [1934a] 1968. *The Supply and Control of Money in the United States*. New York, NY: Russell & Russell.
- Currie, Lauchlin B. [1934b] 1968. “A Proposed Revision of the Monetary System of the United States, Submitted to Secretary of the Treasury Henry Morgenthau, September 1934”, in *The Supply and Control of Money in the United States*, by Lauchlin B. Currie, pp. 195–226. New York, NY: Russell & Russell.
- Currie, Lauchlin B. [1938] 2004. “The 100 Percent Reserve Plan, August 12, 1938”. *Journal of Economic Studies* 31 (3/4): 355–365.
- De Vecchi, Nicolás. 1995. *Entrepreneurs, Institutions and Economic Change. The Economic Thought of J.A. Schumpeter (1905-1925)*. Aldershot, UK: Edward Elgar.
- Demeulemeester, Samuel. 2018. “The 100% Money Proposal and its Implications for Banking: The Currie–Fisher approach versus the Chicago Plan Approach”. *The European Journal of the History of Economic Thought* 25 (2): 357–387.
- Demeulemeester, Samuel. 2020. “Would a State Monopoly over Money Creation Allow for a Reduction of the National Debt? A Study of the ‘Seigniorage Argument’ in Light of the ‘100% Money’ Debates”. *Research in the History of Economic Thought and Methodology* 38A: 123–144.
- Demeulemeester, Samuel. 2021. “The 100% money proposal of the 1930s: An avatar of the Currency School’s reform ideas?”. *The European Journal of the History of Economic Thought* 28 (4): 577–598.
- Dimand, Robert W. 1993. “100% Money: Irving Fisher and banking reform in the 1930s”. *History of Economic Ideas* 1 (2): 59–76.
- Douglas, Paul H. 1935. *Controlling Depressions*. New York, NY: Norton.
- Douglas, Paul H., Irving Fisher, Frank D. Graham, Earl J. Hamilton, Willford I. King and

- Charles R. Whittlesey. 1939. "A Program for Monetary Reform" (dated July 1939, unpublished, Fisher Papers, Yale University Library. Also available (with slightly different page numbers) at: http://faculty.chicagobooth.edu/amir.sufi/research/monetaryreform_1939.pdf . Accessed July 12, 2022.
- Dow, Sheila. 2019. "Monetary Reform, Central Banks, and Digital Currencies". *International Journal of Political Economy* 48 (2): 153–173.
- Dow, Sheila, Guðrún Johnsen and Alberto Montagnoli. 2015. "A Critique of Full Reserve Banking" (Sheffield Economic Research Paper Series, No 2015008).
- Dyson, Ben, Graham Hodgson and Frank van Lerven. 2016a. "A Response to Critiques of 'Full Reserve Banking'". *Cambridge Journal of Economics* 40 (5): 1351–1361.
- Dyson, Ben, Graham Hodgson and Frank van Lerven. 2016b. *Sovereign Money: An Introduction*. London: Positive Money
- Fisher, Irving. [1935] 1997a. *100% Money*. 3rd ed., 1945, in *The Works of Irving Fisher. Volume 11: 100% Money*, edited by William J. Barber, assisted by Robert W. Dimand and Kevin Foster. London: Pickering & Chatto.
- Fisher, Irving. 1937. "Note Suggested by Review of '100 Per Cent Money'". *Journal of the Royal Statistical Society* 100 (2): 296–298.
- Fisher, Irving. [1946] 1997a. "Answers to Objections to the 100% Plan", in *The Works of Irving Fisher. Volume 11: 100% Money*, edited by William J. Barber, assisted by Robert W. Dimand and Kevin Foster, pp. 308-311. London: Pickering & Chatto.
- Fisher, Irving. 1997a. *The Works of Irving Fisher. Volume 14: Correspondence and Other Commentary on Economic Policy, 1930-1947*, edited by William J. Barber, assisted by Robert W. Dimand and Kevin Foster. London: Pickering & Chatto.
- Fontana, Giuseppe and Malcolm Sawyer. 2016. "Full Reserve Banking: More 'Cranks' Than 'Brave Heretics'". *Cambridge Journal of Economics* 40 (5): 1333–1350.
- Fontana, Giuseppe and Malcolm Sawyer. 2017. "A Rejoinder to 'A Response to Critiques of Full Reserve Banking'". *Cambridge Journal of Economics* 41 (6): 1741–1748.
- Friedman, Milton. 1948. "A Monetary and Fiscal Framework for Economic Stability". *The American Economic Review* 38 (3): 245–264.
- Friedman, Milton. 1960. *A Program for Monetary Stability*. New York, NY: Fordham University Press.
- Fullarton, John. [1844] 1845. *On the Regulation of Currencies*. 2nd ed., London: John Murray.
- Goodhart, Charles A. E. 1988. *The Evolution of Central Banks*. Cambridge, MA: MIT Press.
- Goodhart, Charles A. E. 2008. "The Boundary Problem in Financial Regulation". *National Institute Economic Review* 206 (October): 48–55.
- Goodhart, Charles A. E., and Meinhard A. Jensen. 2015. "A Commentary on Patrizio Lainà's 'Proposals for Full- Reserve Banking: A Historical Survey from David Ricardo to Martin Wolf'. Currency School versus Banking School: An Ongoing Confrontation". *Economic Thought* 4 (2): 20–31.
- Graham, Frank D. 1936. "Partial Reserve Money and the 100 Per Cent Proposal." *The American Economic Review*. 26 (3): 428–440.

- Graziani, Augusto. 2003. *The Monetary Theory of Production*. Cambridge, UK: Cambridge University Press.
- Hart, Albert G. 1935. "The 'Chicago Plan' of Banking Reform. A Proposal for Making Monetary Management Effective in the United States". *The Review of Economic Studies* 2 (2): 104–116.
- Huber, Joseph. 2017. *Sovereign Money – Beyond Reserve Banking*. London: Palgrave Macmillan.
- Huber, Joseph and James Robertson. 2000. *Creating New Money: A Monetary Reform for the Information Age*. London: New Economics Foundation.
- Humphrey, Thomas M. 1982. "The Real Bills Doctrine". Federal Reserve Bank of Richmond, *Economic Review* 68 (5): 3–13.
- Humphrey, Thomas M. and Richard H. Timberlake. 2019. *Gold, the Real Bills Doctrine, and the Fed: Sources of Monetary Disorder, 1922–1938*. Washington, D.C.: Cato Institute.
- Ingham, Geoffrey, Ken Coutts and Sue Konzelmann. 2016. "Introduction: 'Crank' and 'Brave Heretics': Rethinking Money and Banking after the Great Financial Crisis". *Cambridge Journal of Economics* 40 (5): 1247–1257.
- Jackson, Andrew and Ben Dyson. 2012. *Modernising Money. Why Our Monetary System is Broken and How It Can Be Fixed*. London: Positive Money.
- Kareken, John H. 1986. "Federal Bank Regulatory Policy: A Description and Some Observations". *The Journal of Business* 59 (1): 3–48.
- King, Mervyn. 2016. *The End of Alchemy. Money, Banking, and The Future of The Global Economy*. New York, NY: W. W. Norton & Company.
- Knight, Frank H., Garfield V. Cox, Aaron Director, Paul H. Douglas, Albert G. Hart, Lloyd W. Mints, Henry Schultz and Henry C. Simons. [1933] 1995. Untitled memorandum on banking reform, dated March 16, 1933, in *The Chicago Plan and New Deal Banking Reform*, by Ronnie J. Phillips, 1995, pp. 191–199. Armonk, N.Y: M.E. Sharpe.
- Krainer, Robert E. 2013. "Towards a program for financial stability". *Journal of Economic Behavior & Organization* 85: 207–218.
- Krainer, Robert E. 2017. "Economic stability under alternative banking systems: Theory and policy". *Journal of Financial Stability* 31: 107–118.
- Kregel, Jan A. 2012. "Minsky and the Narrow Banking Proposal: No Solution for Financial Reform" (Public Policy Brief No. 125, Levy Economics Institute of Bard College).
- Laidler, David. 1999. *Fabricating the Keynesian Revolution*. Cambridge, UK: Cambridge University Press.
- Lavoie, Marc. 2014. *Post-Keynesian Economics: New Foundations*. Cheltenham: Edward Elgar.
- Lester, Richard A. 1935. "Check-book Inflation". *The American Scholar* 4 (1): 30–40.
- Lester, Richard A. 1939. *Monetary Experiments. Early American and Recent Scandinavian*. Princeton, NJ: Princeton University Press.
- Lester, Richard A. 1941. "Gold Money, Bank Money, and Real Money". *The Virginia Quarterly Review* 17 (2): 251–264.

- Litan, Robert E. 1987. *What Should Banks Do?* Washington, D.C.: The Brookings Institution.
- Lutz, Friedrich A. 1936. *Das Grundproblem Der Geldverfassung*. Stuttgart and Berlin: W. Kohlhammer.
- Minsky, Hyman P. 1994. “Financial Instability and the Decline (?) of Banking: Future Policy Implications” (Working Paper No. 127, The Jerome Levy Research Institute of Bard College, October 1994).
- Minsky, Hyman P. 1995. “Would Universal Banking Benefit the U.S. Economy?” (Hyman P. Minsky Archive, Paper 51, reworked version dated April 5, 1995).
- Mints, Lloyd W. 1945. *A History of Banking Theory in Great Britain and the United States*. Chicago: University of Chicago Press.
- Mises (von), Ludwig. [1912] 1953. *The Theory of Money and Credit*. 2nd ed., English translation by H. E. Batson, New Haven: Yale University Press. First German edition: *Theorie Des Geldes Und Der Umlaufsmittel*. München und Leipzig: Ferlag von Duncker & Humblot, 1912.
- Nersisyan, Yeva and L. Randall Wray. 2016. “Modern Money Theory and the Facts of Experience”. *Cambridge Journal of Economics* 40 (5): 1297–1316.
- Nersisyan, Yeva and L. Randall Wray. 2017. “Cranks and Heretics: The Importance of an Analytical Framework”. *Cambridge Journal of Economics* 41 (6): 1749–1760.
- Phillips, Ronnie J. 1995. *The Chicago Plan and New Deal Banking Reform* (with a foreword by H. P. Minsky). Armonk, NY: M.E. Sharpe.
- Prescott, Edward C. 2014. “Interest on Reserves, Policy Rules and Quantitative Easing”. *Journal of Economic Dynamics and Control* 49: 109–111.
- Prescott, Edward C. and Ryan Wessel. 2016. “Monetary Policy with 100 Percent Reserve Banking: An Exploration” (NBER Working Paper No. 22431, National Bureau of Economic Research).
- Reich, Jens. 2017. *Seigniorage. On the Revenue from the Creation of Money*. Cham: Springer.
- Sandilands, Roger J. 2004. “Editor’s introduction. New light on Lauchlin Currie’s monetary economics in the New Deal and beyond”. *Journal of Economic Studies* 31 (3/4): 171–193.
- Schularick, Moritz and Alan M. Taylor. 2012. “Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870–2008”. *American Economic Review* 102 (2): 1029–1061.
- Simons, Henry C. 1934. *A Positive Program for Laissez-Faire*. Public Policy Pamphlet No 15, Chicago: University of Chicago Press.
- Simons, Henry C. 1936. “Rules versus Authorities in Monetary Policy”. *Journal of Political Economy* 44 (1): 1–30.
- Simons, Henry C. 1946. “Debt Policy and Banking Policy”. *The Review of Economics and Statistics* 28 (2): 85–89.
- Simons, Henry C., Garfield V. Cox, Aaron Director, Paul H. Douglas, Albert G. Hart, Frank H. Knight, Lloyd W. Mints and Henry Schultz. [1933] 1994. “Banking and Currency Reform” (memorandum dated November 1933, reprinted in *Research in the History of Economic Thought and Methodology*, Archival Supplement 4, edited by Warren

- Samuels, 1994, JAI Press Inc., pp. 31–40).
- Soddy, Frederick. [1926] 1933. *Wealth, Virtual Wealth and Debt. The Solution of the Economic Paradox*. 2nd ed., London: Britons Publishing Company.
- Tavlas, George S. 2019. “The Group: The Making of the Chicago Monetary Tradition, 1927–36”. *History of Political Economy* 51 (2): 259–296.
- Thornton, Henry. [1802] 1939. *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain*, edited with an introduction by F. A. von Hayek. London: George Allen & Unwin.
- Tobin, James. 1985. “Financial Innovation and Deregulation in Perspective”. Bank of Japan, *Monetary and Economic Studies* 3: 19–29.
- Tobin, James. 1987. “The Case for Preserving Regulatory Distinctions”, in *Restructuring the Financial System*, pp. 167–83. Kansas City: Federal Reserve Bank of Kansas City.
- Tolle, Marilyne. 2016. “Central bank digital currency: The end of monetary policy as we know it?”. Bank Underground blog, July 25. Available at: <https://bankunderground.co.uk/2016/07/25/central-bank-digital-currency-the-end-of-monetary-policy-as-we-know-it/>. Accessed July 12, 2022.
- Tolley, George. S. 1962. “100 Per Cent Reserve Banking”, in *In Search of a Monetary Constitution*, edited by Leland B. Yeager, pp. 275–304. Cambridge, MA: Harvard University Press.
- Tooke, Thomas. 1844. *An Enquiry into the Currency Principle*. London: Longman, Brown, Green and Longmans.
- Tooke, Thomas. 1848. *A History of Prices and of the State of the Circulation, 1839–1847. Volume 4*. London: Longman, Brown, Green and Longmans.
- Vernengo, Matías. 2006. “Money and Inflation”, in *A Handbook of Alternative Monetary Economics*, edited by Philip Arestis and Malcolm Sawyer, pp. 471–489. Cheltenham: Edward Elgar.
- Von der Becke, Susanne and Didier Sornette. 2017. “Should Banks Be Banned From Creating Money? An Analysis From the Perspective of Hierarchical Money”. *Journal of Economic Issues* 51 (4): 1019–1032.
- Walras, Léon. 1898. *Études d'économie politique appliquée. Théorie de la production de la richesse sociale*. Lausanne : F. Rouge; Paris: F. Pichon.
- Walsh, Carl E. [1998] 2010. *Monetary Theory and Policy*. 3rd ed., Cambridge, MA: MIT Press.
- Whalen, Charles J. 1994. “Henry Simons on Banking and Currency Reform: An Introduction”. *Research in the History of Economic Thought and Methodology*, Archival Supplement 4: 23–29.
- Whittlesey, Charles R. 1935. *Banking and the New Deal*. Public Policy Pamphlet No. 16. Chicago, IL: University of Chicago Press.