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Betreff: Re: disproved theories in economics
Datum: Tue, 22 Mar 2016 12:55:40 +0000 (*2016-03-22 13:55:40*)

Dear Board members,

This is, indeed, a subject on which I have been writing quite a lot. I attach four papers that you might like to read and note. One involves a discussion between Laina and myself, and the other two are papers by myself alone, one of them recent and another from a few years ago.

I hope that you find these interesting and relevant to your queries.

Best wishes,
Charles Goodhart

The Continuing Muddles of Monetary Theory: A Steadfast Refusal to Face Facts

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Abstract

Lionel Robbins was much concerned about the methodology of economic science. When he discussed the desirable relationship between theory and 'reality', two of the three examples that he presented where the theoretical analysis was not sufficiently based on a knowledge of historical fact were taken from monetary economics. Indeed, monetary theory has remained prone to such shortcomings ever since.

Amongst the worst are:-

(1) IS/LM: the monetary authorities set the monetary base, and the interest rate is determined in the market;

(2) The monetary base multiplier of bank deposits, and the role of reserve ratios;

(3) The current three equation neo-classical consensus, which not only assumes perfect creditworthiness for all agents, but also an essentially non-monetary system, e.g. no need for banks;

(4) The standard theory of the evolution of money.

Monetary economics can only get better, but it has a long way yet to go.

Keywords: Monetary theory; IS/LM; Monetary base multiplier; Default; Evolution of money

JEL categories: B22, E40, E42, E51, E59

The Continuing Muddles of Monetary Theory: A Steadfast Refusal to Face Facts

A. Economic Generalisations and Reality

Lionel Robbins was much concerned with the methodology of economic science, and wrote several books on this subject.[1] For the purposes of this paper, I shall focus on the relationship between theory and factual knowledge, or as Robbins put it, between 'Economic Generalisations and Reality', which was the subject of Chapter V of his book entitled, An Essay on the Nature and Significance of Economic Science (3rd Edition, 1984).

On this relationship, I have selected the following statements as representing the core of Robbins' position:-

> "It is a characteristic of scientific generalisations that they refer to reality. Whether they are cast in hypothetical or categorical form, they are distinguished from the propositions of pure logic and mathematics by the fact that in some sense their reference is to that which exists, or that which may exist, rather than to purely formal relations." …p. 104.
>
> "It follows, too, that it is a complete mistake to regard the economist, whatever his degree of "purity", as concerned merely with pure deduction. It is quite true that much of his work is in the nature of elaborate processes of inference. But it is quite untrue to suppose that it is only, or indeed mainly, thus. The concern of the economist is the interpretation of reality."…p. 105.
>
> "The fruitful conduct of realistic investigations can only be undertaken by those who have a firm grasp of analytical principle and some notion of what can and what cannot legitimately be expected from activities of this sort.
>
> But what, then, are legitimate expectations in this respect? We may group them under three headings.
>
> The first and the most obvious is the provision of a check on the applicability to given situations of different types of theoretical constructions. As we have seen already, the *validity* of a particular theory is a matter of its logical derivation from the general assumptions which it

[1] I am grateful to Amos Witztum for pointing me in this direction.

> makes. But its *applicability* to a given situation depends upon the extent to which its concepts actually reflect the forces operating in that situation. Now the concrete manifestations of scarcity are various and changing; and, unless there is continuous check on the words which are used to describe them, there is always a danger that the area of application of a particular principle may be misconceived. The terminology of theory and the terminology of practice, although apparently identical, may, in fact, cover different areas."…pp 116-177
>
> "Secondly, and closely connected with this first function of realistic studies, we may expect the suggestion of those auxiliary postulates whose part in the structure of analysis was discussed in the last chapter. By inspection of different fields of economic activity we may expect to discover types of the configuration of the data suitable for further analytical study…..
>
> And, thirdly, we may expect of realistic studies not merely a knowledge of the application of particular theories, and the assumptions which make them appropriate to particular situations, but also the exposure of areas where pure theory needs to be reformulated and extended. They bring to light new problems."…p. 118

When Robbins comes to give illustrations, it is notable that his examples of failures to take facts, 'reality', into consideration in both his first and second heading were taken from monetary theory. Thus his first example relates to the need to identify what is used as money in order to test the quantity theory of money.[2] His second example related to the relationship between the reserve base available to banks and the size of the money stock[3], on which I shall have more to say later.

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[2] "A simple illustration will make this clear. According to pure monetary theory, if the quantity of money in circulation is increased and other things remain the same, the value of money must fall. This proposition is deducible from the most elementary facts of experience of the science, and its truth is independent of further inductive test. But its applicability to a given situation depends upon a correct understanding of what things are to be regarded as money; and this is a matter which can only be discovered by reference back to the facts. It may well be that over a period of time the concrete significance of the term "money" has altered. If then, while retaining the original term, we proceed to interpret a new situation in terms of the original content, we may be led into serious misapprehension. We may even conclude that the *theory* is fallacious. It is indeed well known that this has happened again and again in the course of the history of theory. The failure of the Currency School to secure permanent acceptance for their theory of Banking and the Exchanges, in other respects so greatly superior to that of their opponents, was notoriously due to their failure to perceive the importance of including Bank Credit in their conception of money. Only by continuously sifting and scrutiny of the changing body of facts can such misapprehensions be avoided."…pp 117/118

[3] "Again, we may take an example from the theory of money. It will be clear from an inspection of the actual procedure of banks of issue that the effect upon the supply of money in the widest sense of given additions to the reserve of precious metals will depend upon the exact nature of the law and practice concerning reserve requirements. It follows,

B. The IS/LM Basic Model

Most economic undergraduates still get their initial exposure to macro-economics in the guise of the IS/LM model, and it sits at the centre of most introductory textbooks[4], even today; it certainly did so in 1957, when Robin Matthews taught me at Cambridge.

You will recall that,

$$y = I + C \qquad \text{(expenditure)} \qquad (1)$$

$$y = S + C \qquad \text{(use of income)} \qquad (2)$$

So in equilibrium I must equal S;

$$I = f(i),\ f' < 0 \qquad (3)$$

$$S = f(y),\ f' > 0 \qquad (4)$$

where y is output, I investment, C Consumption, S Saving, i the interest rate. When this model was first put together, in the late 1930s, 'the rate of interest' was more commonly taken to be the long-term rate of interest. Now it is usually taken to be the short-term rate[5], to which the long-term rate is related by an expectations-based, no-arbitrage, yield curve.

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therefore, that in the full elaboration of the theory of money we must introduce alternative assumptions, taking account of the various possibilities in this respect. It is clear that these are not possibilities which are necessarily easily exhausted by general reflections on the nature of banks of issue. Only close study of the facts is likely to reveal which assumptions are most likely to have a counterpart in reality, which assumptions, therefore, it is most convenient to make."…p. 118

[4] See Begg et al. (2005); Lipsey and Chrystal (2007).

[5] Tim Congdon has frequently noted how the meaning of economic concepts, such as the output gap, tends to migrate over time.

Also the demand of money must equal the supply of money, which is assumed to be set by the Central Bank, so M_S is given, and in equilibrium

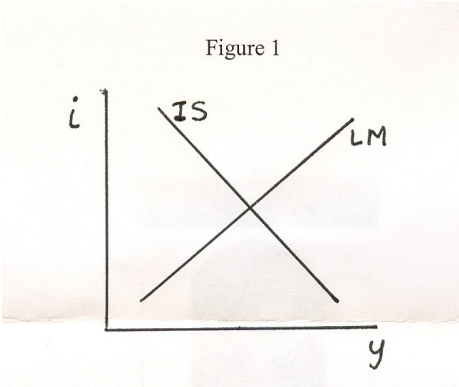
$$M_S = M_D \qquad (5)$$

Since,

$$M_D = f(Y, i),\ f'_y > 0,\ f'_i < 0 \qquad (6)$$

Which gives us:-

Figure 1

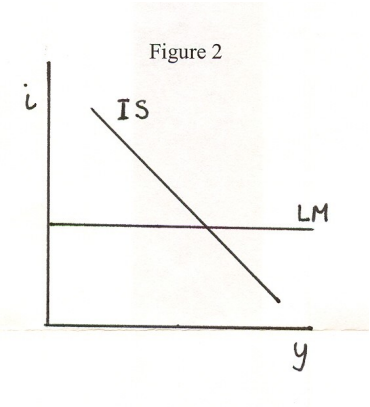


This is probably the second most famous diagram in economics.

The basic problem with this formulation was that no Central Bank has ever operated in this way.[6] Instead they set the short-term official policy rate, or maintain a fixed exchange rate peg against the currency of another country, which in turn has a Central Bank which sets a policy rate. This means that at any point of time the LM curve is horizontal.

[6] There can be a few historical qualifications to this dictum, but they are sufficiently rare, and doubtful under careful analysis, to ignore.

Figure 2



This means that there was a discrepancy between discussions and proposals about current policy, which were naturally couched in terms of how the Central Bank should vary its policy rate, and theoretical analysis of how it should allow the monetary base to vary. Admittedly in a given context[7], there is a dual relationship so that a given interest rate implies a certain stock of monetary base, and vice versa, but, under conditions of uncertainty, the Central Bank would not know what level of interest rates would be associated with what level of monetary base, and vice versa. That, of course, led on to the famous Poole article (1970), which suggested that the case for choosing to set M or i depended on the relative stability (predictability) of the demand for money and investment functions. It is the case that the instability (unpredictability) of the demand for money functions did help to bring about the demise of pragmatic monetary targetry in the mid 1980s. But none of the monetary target mechanisms, including Volcker's famous non-borrowed reserve target, ever denied commercial banks access to cash, at a predictable interest rate, though in the above case via borrowing at the discount window which involved some small non-pecuniary cost.

[7] Making a strong assumption about the existence of a single unique equilibrium.

The real reason why Central Banks set interest rates, rather than a monetary aggregate, relates to its financial stability objective, not to its macro-monetary price control aim (though the two are, of course, intertwined). Commercial banks cannot operate a fractional reserve system, with relatively low levels of cash and liquid assets, without assured recourse, at a predictable interest rate, to cash on demand, see Goodhart, Sunirand and Tsomocos (2007). Of course, one could run a free-banking system, but this would simultaneously raise the cost of intermediation (as more capital and liquid assets would have to be held by the banks), and, most likely[8], the probability and severity of financial crises.

In another famous article, Sargent and Wallace (1973) demonstrated that, if the policy interest rate was exogenously set, then the macro-economic system, especially the price level, would become totally unstable and would explode. Whereas if the Central Bank set the money stock, the macro-monetary system would be stable, (though, as I have asserted, the financial system would become unstable, with panics and collapses). This seemed to overlook the historical fact that Central Banks had been setting interest rates on a regular basis, and only on some rare occasions did macro-economic price instability ensue.

The resolution of this conflict between reality and theory was, as is now well known, resolved by the realisation that Central Banks did not set interest rates exogenously, but endogenously in response to current, and expected, macro-economic developments, especially to forecasts of inflation. This was encapsulated in the Taylor reaction function,

[8] In view of the Fed's failure to mitigate the 1929-33 great depression in the USA, this latter claim is debatable.

$$i = a + b_1(\pi - \pi^*) + b_2(y) \qquad (7)$$

where π = inflation, π^* = the inflation target, y is the output gap. To this is added the Taylor principle that stability will be achieved so long as $b_1 > 1$. [9]

So, at least, this division between reality (Central Banks set interest rates, not monetary quantities) and theory has at long last[10] been resolved, as it must eventually be, in favour of reality.

While the question of what the Central Bank is trying to do has now been settled, the subsidiary issue of exactly how it goes about doing this remains open. The Taylor reaction function relates the present choice of interest rates to the current deviations of inflation from target and output from potential. Because of the long and variable lags in the transmission mechanism from monetary policy to controlling inflation, Central Banks in practice decide on present changes in interest rates on the basis of their forecasts of future deviations of inflation from target, (and of output from potential). Such forecasts are not always easily available, and those that are published by Central Banks are usually ex post, i.e. after the interest rate decision has been taken, not ex ante, i.e. the forecasts that triggered the decision. This can make quite a difference to the econometric results (Goodhart, 2005). While it can be argued that current deviations are an important input into forecasts of future deviations, nevertheless the discrepancy between the way that the Taylor reaction function assumes that Central Banks behave and the way that they actually do so has distorted much research and analysis in this area.

[9] Actually the stability condition is somewhat more complicated than this, but the simple form will do, and is widely used.

[10] Taylor's first article on this did not appear until 1993.

C. The Base Multiplier

Analysis of the determination of the money stock is frequently undertaken via the base money multiplier, e.g. Friedman and Schwartz (1963).

$$M = H \frac{(1 + C/D)}{(R/D + C/D)} \qquad (8)$$

Whereas this is frequently misinterpreted as a behavioural equation, it is in fact a definitional identity, derived from the two identities,

$$M = D + C \qquad (9)$$

(the money stock is defined as deposits plus currency in the hands of the public), and

$$H = R + C \qquad (10)$$

(the high powered money stock is defined as the reserves of the banking system and currency outstanding; to get from (9) and (10) to (8) divide throughout by D and then divide (9) by (10)).

Since equation (8) above is a definitional identity it gives no clues at all to the direction of causation. If, however, one should assume that the Central Bank operates by fixing the monetary base (H), then that, (plus variations in the two ratios, which may be influenced by policy (R/D), and by confidence in the banking system (C/D), and other economic factors, e.g. relative interest rates), determines M, the money stock. But, if, as we have now seen, it is agreed that the Central Bank sets a policy interest rate, then given the demand for money and credit, and the factors affecting the two ratios, the so-called multiplier simply determines the quantity of high-powered money (H) and bank reserves (R) that the Central Bank has to create in order to maintain its desired rate of interest. The base multiplier in reality works in reverse,

determining H, not M. Economists, and others, often fail to appreciate this. It is not uncommon to find textbooks incorporating both a Taylor reaction function and a standard base multiplier, wherein the CB is supposed to control H in order to determine M! See, for example, Blanchard (2006), Dornbusch, Fischer and Startz (2001).

This misunderstanding has caused numerous policy errors. It leads people to believe that raising the reserve ratio, e.g. by calls for Special Deposits, will have a significant direct effect in reducing the money stock. In practice, in order to maintain the chosen interest rate, the Central Bank has to provide the extra reserves required, after the minimum reserve ratio has been raised, in order to maintain the given interest rate. It usually does so in effect by buying short-dated liquid assets from the banks. Since such reserves are required to be held, and generally offer a zero or lower interest rate, the net effect is to make banks both less liquid and less profitable. The latter may induce the banks to widen the spread between deposit and loan rates, which will tend to reduce money (and credit) expansion slightly, but also to shift bank portfolios towards riskier, but higher yielding, loans. Reserve requirements are, therefore, best seen as a tax on banks, slightly reducing their growth rate and making them both less liquid and less risk averse. In so far as taxes can be avoided by shifting location, they will be.[11]

Next, it is often stated that Central Banks have a choice whether to sterilise, or not, intervention in the foreign exchange market. In fact, so long as they seek to maintain

[11] There were many policy discussions about whether, and how, to impose reserve requirements on the euro-$ international markets in the 1970s and 1980s. These were made more difficult since many of the participants misunderstood the base multiplier analysis.

some given policy-determined domestic interest rate (greater than zero), they have no such choice. Such intervention will automatically be sterilised.

The failure to appreciate this mechanism has also complicated discussion of monetary policy during the 2007 financial crisis. When banks wanted more cash, they were automatically given it by all Central Banks. Because of counterparty risk, and projections of future calls for extra bank funding, (to replace asset-backed commercial paper not being rolled-over), banks would not lend to each other in the three-month interbank market, so three month Libor rates rose relative to overnight rates. To reduce this latter rate, Central Banks either had to lower the short-term policy rate, or try to undertake an 'operation twist', in which they buy (lend on) 3 month paper and offset this by net sales (borrowing) overnight in order to keep overnight rates close to the policy rate. In the past such an operation twist has rarely been successful, but it may well have been worth attempting in the recent crisis, (what can one lose from it?).

D. The Current Consensus Model

Besides the shift from assuming that the Central Bank sets the monetary base, to the realisation that it sets a policy interest rate, recent decades have seen two revolutions, the adoption of rational expectations and quest for optimising micro-foundations, both connected with the work of Lucas, (e.g. 1972, 1976). This has led the initial two equation model to morph into the current consensus three equation model, whose domination of analysis is stronger than ever. As is well-known, this takes the form:-

$$y_t = E(y) + b_1(i_t - E(\pi)),\ b_1 < 0 \qquad (11)$$

$$\pi_t = E(\pi) + b_2(y),\ b_2 > 0 \qquad (12)$$

$$i_t = b_3(\pi - \pi^*) + b_4(y),\ b_3 > 1,\ b_4 > 0 \qquad (13)$$

where E, the expectations operator, is some combination of backwards and forwards looking elements, y is the estimated output gap, and equation (13) is the Taylor reaction function.

Equations 11 (the old I/S curve) and 12 (the old Phillips curve) are, in turn, derived from an underlying optimising DSGE model, plus a (rather dodgy) assumption/estimate of temporary wage/price frictions/rigidities (e.g. Calvo pricing) (Calvo, 1983). Amongst the several problems/disadvantages of this current consensus is that, in order to make a rational expectations, micro-founded model mathematically and analytically tractable it has been necessary in general to impose some (absurdly) simplifying assumptions, notably the existence of representative agents, who <u>never</u> default. This latter (nonsensical) assumption goes under the jargon term as the transversality condition.

This makes <u>all</u> agents perfectly creditworthy. Over any horizon there is only one interest rate facing <u>all</u> agents, i.e. no risk premia. All transactions can be undertaken in capital markets; there is no role for banks. Since all IOUs are perfectly credit-worthy, there is no need for money. There are no credit constraints, (everyone is angelic; there is no fraud; and this is supposed to be properly micro-founded!). Money is generally introduced into the model by auxiliary ad hoc frictions, e.g. cash in advance requirements or limited participation, both of which are totally internally inconsistent with a world without any default. Essentially, therefore, the consensus three equation model assumes a non-monetary, non-banking, system, so it is no

surprise that most theoretical adherents of it tend to down-play attention to, or concern with, purely monetary variables, e.g. the monetary aggregates, (see for example Woodford, Svensson, (Woodford, 2003, 2007; Svensson, 2003, 2007)

Under normal circumstances risk premia remain, more or less, steady and defaults are low. In these (fair weather) circumstances, the main driving force affecting financial conditions is the change in the official policy rate, and expectations of future developments to inflation, the output gap and policy rates. In such usual circumstances the consensus model and its background DSGE representations will work well.

But every now and again, and 2007 has become an example, risk premia shift sharply, as do credit constraints. Defaults, and fear of future defaults, can rise sharply. DSGE, and the consensus, models have no capacity (at present) to incorporate such effects. A variety of, ad hoc, auxiliary data (on credit conditions) and subjective add-ons have to be bolted on to forecasting models. The modellers' hope is that the monetary authorities can restore calm (normal conditions) quickly enough to make the standard model usable again. But the truth is that such models can neither forecast financial disturbances, nor the scale of their effect while a crisis persists. This is hardly surprising since the models abstract from the possibility of any such crisis by definition.

A further implication of this is that the basic analytical paradigms of the macro-monetary side of a Central Bank and of its financial stability wing are mutually inconsistent, and rarely interconnect. The former (macro-monetary side) uses a model

that abstracts from default. The financial stability department cannot do so, but struggles to find a theoretical underpinning.[12]

Hy Minsky (e.g. 1982) gave a verbal description of financial processes, but this has been generally dismissed as insufficiently rigorous, non-mathematical and not based on rational expectations or micro-foundations. Martin Shubik (e.g. 1973, 1977, 1999) provided a much more rigorous and well-founded account of a monetary/banking system in which default plays a central role, but his work has also been largely bypassed, for reasons that elude me, by the mainstream. D. Tsomocos and I have been trying to build on Shubik's work to develop practical, yet rigorous, models of the interaction between risk aversion, default probabilities and the real economy, (e.g. 2004, 2005a and b, 2006a and b, 2007). There is a long way to go, but a good starting point would be a recognise the inherent lack of realism, and deficiency, of any model, such as the current consensus model which fails to have a central role for default.

E. The Evolution of Money

Kiyotaki and Moore (2002) wittily and correctly coined the phrase 'Evil is the root of all money'. I described in the last Section how human failings in the shape of refusals, and/or inability, to honour promises to repay debts (i.e. defaults) was central to the need for, and shape of, our monetary system. Another key failing of our human society is the predilection of the strong to prey (often violently) on the weak. In order to prevent society falling into Hobbesian chaos, there is a need for government, (often

[12] I have a soft-spot for the old 'real bills' doctrine. It was analytically flawed, but it did unify the macro-monetary and the financial stability objectives. The idea was that, if a Central Bank limited its discounts to commercial bills based on real trading activity, it would simultaneously stabilise both inflation and the banking/financial system.

in the guise of the strongest power, see Mancur Olson (2000); 'power grows out of the barrel of a gun').

Besides the pure rents that government can levy, they do have expenditures, on the army, police, justice system, etc. In some early governments, e.g. in early Egypt, these were financed in kind by transfers of labour services or goods (a set proportion of the harvest) to government. But this was highly inefficient. Payment in kind did not provide the government with the proportions of goods and (labour) services that it needed. A solution to this was for the government to issue claims on itself, (supported by, but not entirely dependent on, the intrinsic value of metallic coins in many cases), which it promised to accept in payment of taxes (in lieu of goods and services). Such promises were generally credible, (they were backed by the power of the state), so long as,

(i) the purchasing power of money was not debauched by over-issue and devaluation; and

(ii) the power of the state was not threatened.[13]

Violence is endemic in human societies, and can lead to debilitating and persistent feuds that disrupt the social framework. 'An eye for an eye, and a tooth for a tooth' is a natural, but not a welfare enhancing, response. Another key factor leading to a monetary system is the need for a common tariff whereby the wrong done by X on Y can be settled and expurgated by the transfer of a predetermined number of units of some object from the transgressor (or his clan) to the victim. That object will evolve

[13] If the state collapsed, the value of its outstanding money would fall back to its intrinsic value as a pure commodity, whether of gold or as art-work, as in defaulted government bonds.

into a monetary unit. Indeed many societal relationships, such as the bride price, involve transfers of monetary type objects.

Money was invented as a social, and governmental, phenomenon[14], not as a means of reducing transactions costs in markets. The invention of money probably predated the development of formal markets; thus money facilitated the rise of markets, rather than vice versa. One piece of evidence of this is that many early money forms, notably cattle, (the word pecuniary derives from the later Latin word 'pecus'), are highly unsuitable for ordinary transactions, (being neither standardised, easily portable nor divisible). Even gold coins, the prototype of early metallic money, were so expensive relative to regular wages/goods prices that they would very rarely be usable in day-to-day transactions.

Our knowledge of the monetary systems in primitive and early societies is necessarily somewhat sketchy. Nevertheless I believe that the consensus among historians and anthropologists is that money developed as a social (and governmental) artefact, rather than as a mechanism for reducing transactions costs in private-sector markets. But such a viewpoint is somewhat woolly and socio-logical, and has not, in the past[15], lent itself to mathematical modelling. So, economists have tended to ignore historical reality, to establish formal mathematical models of how private agents (with no government), transacting amongst themselves, might jointly adopt an equilibrium in which they all settle on a common monetary instrument.

[14] Though money did reduce the transactions costs of government.

[15] There is an excellent paper by Dror Goldberg of Texas A&M on 'The Tax-Foundation Theory of Fiat Money', which uses a dynamic mathematical model. Perhaps once economists see that the realistic approach can be rigorously expressed in abstract theory, they will become more willing to accept its historical validity.

Does such a misconception matter? I have argued that it does, particularly in the case of the euro-zone, in my paper on 'The Two Concepts of Money' (2003). The concept, originally developed by Menger (1892), that money emerged as a private-sector initiative (to cut transactions costs), implied that you could change the monetary regime within the EU without worrying much about the need for associated adjustments to the fiscal regime. On the other hand, if money is a social artefact, then a key feature of any monetary regime change must be to design the appropriate accompanying fiscal measures.

Let me take a current concern. The adoption of a single currency is being accompanied, as intended, by the emergence of pan-European banks. That has led to proposals for a common pan-European system of banking supervision and of crisis management and resolution for such banks, in order to handle cross-border co-ordination problems. Crisis resolution is, however, potentially very expensive. There is no current fiscal mechanism to provide funds for crisis management at the federal level; that can only be done at national level. So long as the fiscal funding remains the responsibility of the constituent nation states, it is difficult to see how banking (financial) supervision and crisis management could be moved to a federal pan-European level.

F. Conclusions

John Hicks (1969), at least in his later years, argued that monetary economics needed to be firmly grounded on a knowledge of historical and institutional fact. Yet in recent decades the suggestion that Prof. X took an institutional approach to monetary analysis was sufficient to cast his/her reputation into outer darkness. Only small groups of mainly heterodox (and of various hues of post-Keynesian views) economists have bothered much to relate theory to reality. Why this has been so, I do not know. That it has been so, as I have sought to document, is not a good advertisement for this sub-sector of our profession.

In particular, Lionel Robbins argued that the applicability of a theory "to a given situation depends upon the extent to which its concepts actually reflect the forces operating in that situation". I have argued, above, that the current dominant consensus money/macro model, the standard DSGE model, abstracts from, (or 'excludes' as Brian Loasby, (2008), would put it), any possibility of failure, or default, and thereby largely eliminates any rationale for banks, financial intermediaries, or even money. That this is strictly insufficient and inappropriate has been all too clearly illustrated by the events of 2007/8. Robbins admitted when he had been mistaken in his analysis of the Great Depression. I hope that the mainstream money/macro theorists will similarly admit the shortcomings of their own current models in the current context.

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The Determination of the Quantity of Bank Deposits

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A. The Monetary Base, Money Multiplier Story

Until a relatively few years ago the determination of the money supply was generally taught in textbooks in terms of the monetary base, money multiplier story, which had been given prominence as the analytical basis for the great book on US monetary history by Friedman and Schwartz (1963). In reality this story was incorrect. Although the money multiplier is derived from an identity, the causal direction works in exactly the reverse direction to that normally supposed in such texts. The Central Bank normally decides on the official short term interest rate that it wants to set, and the two key ratios, the currency/deposit (C/D) ratio and the desired reserve/deposit rate of the banks (R/D), determine the monetary base that the Central Bank *has* to create if it is to keep short-term market rates in line with the intended official rate. In truth, it is not so much a money multiplier, as a money divisor, which determines how much base money is consistent with the stock of money and the two key ratios (C/D and R/D) at the chosen level of interest rates.

It is an obvious fact that the Central Bank, via its monetary policy committee, (MPC in the UK, or FOMC in the USA), sets the interest rate, and not, (prior to the attainment of the zero lower bound (ZLB)), the growth rate of the high-powered monetary base (H). So there was a patent inconsistency in most earlier monetary economics. When discussing current public policy issues, monetary economists would advocate that the MPC change the official short rate to such and such an extent, whereas in their theoretical analysis they would assume that the authorities set the monetary base (H), thereby allowing short-term interest rates to be set by market forces to equate the demand and supply of money, (Goodhart 2009).

1 My thanks are due to Tim Congdon, David Green, Mervyn King, Carolyn Sissoko and David Walker for comments on this paper. But any remaining errors are my own responsibility.

This inherent inconsistency continued for decades, troubling only a small minority of analysts. What has now given the money multiplier story the coup de grace is the recent experience during the Great Financial Crisis. Once the official desired short-term interest had reached the zero lower bound (ZLB) in early 2009, there was no further need to restrain the growth of H in order to maintain a desired positive level of official short-term interest rates. Instead, to enhance the degree of monetary expansion, the monetary base was raised massively via Quantitative Easing (QE). But rather than promoting a roughly equivalent rise in the broader monetary aggregates, the money multiplier totally collapsed.[2] The broader monetary aggregates stagnated at the same time as the monetary base expanded dramatically.

A few numerical examples are shown in Table 1 below:-

Table 1

	% change in		
	H	M	Ratio M/H
US 2009	22.5	3.7	-15.3
2010	0.6	3.6	2.9
2011	31.2	9.7	-16.4
2012	2.9	8.2	5.1
2013	39.3	5.4	-24.3
2014	5.9	5.9	0.0
Japan 2009	5.2	2.2	-2.8
2010	7.0	1.8	-4.9
2011	13.8	2.6	-9.8
2012	12.5	2.1	-9.2
2013	47.7	3.3	-30.1
2014	39.1	2.9	-26.1
UK 2009	109.7	5.6	-49.6
2010	-1.3	5.5	6.9
2011	14.0	-3.1	-15.1
2012	50.5	0.2	-33.4
2013	7.6	0.7	-6.5
2014	1.5	-0.1	-1.6
Eurozone 2009	-8.2	-0.5	8.3
2010	2.7	-0.7	-3.3
2011	25.1	2.2	-18.3
2012	22.7	3.0	-16.1

2 There was a somewhat similar collapse in the money multiplier in the Great Depression in the 1930s, but for rather different reasons, i.e. a sharp change in the desired C/D ratio, rather than in the desired R/D rates.

2013	-26.7	0.5	37.1
2014	-0.2	4.8	5.0

Against this background, it has become, in practice, impossible to continue with the fiction that the Central Bank sets the money stock by varying the monetary base within a system in which there was a predictably stable money multiplier. With the monetary base/money multiplier theory thus discredited, a search has now started for a new, revised paradigm to explain the determination of the supply of money.

Before we move on to discuss this search for a new paradigm, we should, perhaps, ask two questions. The first question is why have almost all Central Banks, almost all the time (except, for example, when at the ZLB) chosen to set interest rates, and not the quantity of base money (H)? We shall, however, defer giving the answer to this until later in this paper. The second question is why did the money multiplier collapse, and the R/D ratio balloon once Central Banks espoused QE?

The short answer to this second question, explained at greater length in one of my recent papers, (2015a), is that commercial banks found themselves in a liquidity trap. Interest rates on longer dated safe debt, whether public or private, had been lowered to such low levels that the likely next move was up, thereby involving expected capital losses. Large, safe private corporates could borrow more cheaply on capital markets. Lending to risky smaller private sector borrowers, especially in view of the now higher capital requirements, could only be done profitably on banking terms and conditions that relatively few such borrowers were able and willing to meet. So, at the margin, holding additional cash reserves at the Central Banks, in some cases, as in the USA, at a small positive interest rate, with no capital requirement and adding to liquidity, became the preferred option.

B. The New Paradigm: Commercial Bank Credit Expansion Creates Deposits

In many, but not all, cases a bank makes a loan, a term loan to a corporate, or a mortgage loan to a person, by simultaneously writing up both its asset book (loan to X) and its liabilities (deposit of X). That loans create deposits has been a (reasonably) well-known fact for a century, or more; this argument is, for

example, to be found in Dennis Robertson's textbook on *Money*, first published in (1922).

This argument, that loans create deposits and, thus, that commercial banks themselves determine the supply of money, has the considerable advantage that it is partially true, unlike the monetary base/money multiplier story which got the whole process the wrong way around, the reverse of truth. So initially I quite welcomed this line of thought. But it is, at best, only partially true, as I shall recount shortly, and the policy implications that some adherents of this approach draw from it, for example that commercial banks' capacity to create loans and deposits needs to be further curtailed or removed, need to be treated sceptically. This is, perhaps, all the more important since this analytical approach appears to be receiving the imprimatur of the Bank of England.

Two recent examples are McLeay, Radia and Thomas (2014), and Jakab and Kumhof (2015).[3] The summaries of these two papers are as follows:-

First, MacLeay, Radia and Thomas,

- "This article explains how the majority of money in the modern economy is created by commercial banks making loans.
- Money creation in practice differs from some popular misconceptions — banks do not act simply as intermediaries, lending out deposits that savers place with them, and nor do they 'multiply up' central bank money to create new loans and deposits.
- The amount of money created in the economy ultimately depends on the monetary policy of the central bank. In normal times, this is carried out by setting interest rates. The central bank can also affect the amount of money directly through purchasing assets or 'quantitative easing'."

Next, Jakab and Kumhof,

> "Abstract
>
> In the intermediation of loanable funds model of banking, banks accept deposits of pre-existing real resources from savers and then lend them to borrowers. In the real world, banks provide financing through money creation. That is they create deposits of new money through lending, and in doing so are mainly constrained by profitability and solvency considerations. This paper contrasts simple intermediation and financing models of banking. Compared to otherwise identical intermediation models, and following identical shocks, financing models predict changes

3 Also see Ryan-Collins, et al. (2011), and Werner (2014 a and b).

> in bank lending that are far larger, happen much faster, and have much greater effects on the real economy."

The first implication of this line of analysis is that, if anything has gone wrong with the monetary system and the credit cycle, it is all the commercial banks' fault, (and this again is partially, but only partially, true), and the following implication is that, to prevent future banking crises, such powers of credit creation should be removed from commercial banks. This latter proposal has been endorsed by those who advocate narrow banking, Kumhof and Benes (2012); a nice history of this set of proposals is given by Laina (2015), 'Proposals for Full-Reserve Banking: A Historical Survey from David Ricardo to Martin Wolf'. As these names indicate, the intellectual weight behind this view, that commercial bank credit creation should be strictly fettered, is impressive. Interestingly this proposal is now apparently to be put into practice in Iceland. Thus Alberto Gallo wrote, *Financial Times*, July 1, 2015, writes,

> "Central bankers are not famous for breaking traditions, but the ones in Iceland may be about to start a revolution. An island of 320,000 with a banking system that grew to more than seven times the size of the economy in 2007, Iceland was hit hard by the financial crisis. Under its proposal to reform its monetary system, Iceland's central bank would take exclusive powers to create money. It would not just set interest rates, but also control the quantity of credit commercial banks would be allowed to lend within a maximum range, reviewed each month.
>
> Iceland's proposal is too centralised to work in an open economy, and overly constraining credit may choke growth. And yet, Icelanders have recognised one of the core problems facing monetary policy in developed countries: central banks cannot control money (credit) creation by commercial banks. As a result, private debt has grown exponentially over the past decades.
>
> "Remember that credit is money," said Benjamin Franklin. And contrary to "popular misconceptions", it is commercial banks — not central banks — that create money and deposits, by issuing loans, as the Bank of England explains in a 2014 report."

Despite being partially correct, this line of argument, taken by itself as a representation of how commercial banks operate, is seriously misleading, so much so as to be almost as erroneous as the money base/money multiplier story and, as I shall show in due course, for the same fundamental reason.

Let us start with the instance most favourable to the claim that bank loans create deposits, that is the occasion when a bank makes a term loan, or grants a mortgage, and does so by, indeed, writing up both sides of the balance sheet. What would happen if the bank client had not, beforehand and expressly, asked

the bank to do so? Picture yourself as a bank client in a situation where, without your leave, the bank increases both a claim on you and a deposit liability to you. Since the interest on the bank loan is (almost always) significantly greater than the deposit interest, the bank would be benefiting at your expense. You would, rightly, be furious, and, if necessary, seek to take legal action against the bank.

The crucial point is that the bank does *not* initiate the bank loan; the borrower does. Banks are in a service industry, like restaurants and hotels. Banks set out the terms and conditions under which they will grant a loan, and then wait for private sector clients to approach them, rather as restaurants set out their menus and prices. You may respond that, even if a private sector potential borrower appears to meet all a bank's stated conditions, a bank can still veto the proposed deal and send the prospective borrower away. But equally a restaurant can refuse to serve a client because (s)he is improperly dressed, drunk, too noisy, with an animal, or for a range of other reasons.

Moreover, the borrower does not take out the term loan, or mortgage, in order to hold onto the deposit, at an adverse spread (at least not normally). They do so to make a payment. Quite often that payment the will be used by the recipient, the payee, to reduce their own outstanding bank borrowing, say by the house seller, or house builder, to reduce their prior bank indebtedness. Again note that while banks have the right to call in loans, they rarely use such powers, and early repayment of outstanding bank loans are, once again, primarily undertaken at the initiative of the borrower. In some systems banks can impose costs and conditions on the early repayment of loans/mortgages, but generally they cannot refuse them. So both the initiation and the conclusion of bank credit to the private sector are primarily determined by the private sector borrower, *not* by the banks.

Rather than claim that banks create credit, and then such loans create money, it would be much nearer the truth to say that the private sector creates credit and money for itself, and that the banking sector is the medium through which private sector clients do so, on the terms and conditions set out by the banks.

This latter becomes even clearer when we turn from term loans and mortgage to overdrafts and credit card lending. In this latter case the key initial decision is the *limit* of borrowing that the bank will honour. The borrower normally pays a small sum for the right to borrow for a particular duration up to an agreed limit, and then the activation of that right is entirely in the hands of the borrower. The

bank does not write up both sides of its balance sheet. The first time that the bank is aware of the transaction is when the payment order, by cheque, card or otherwise, comes in from the borrower. The bank then writes up the loan side of its book, while the counterpart is a debit to another bank, or to another customer of the same bank. The key initial decision is that of the private sector borrower to agree an (overdraft) facility with the bank, on the terms and conditions set by the bank. Thereafter the timing and usage of that facility are (almost) entirely in the hands of the borrower, not of the bank. Indeed the bank in most such cases would be legally committed to doing so.

In a world in which the cash flows of private sector agents can fluctuate sharply in an unpredictable manner, such overdraft facilities are extremely valuable, even when unused. In so far as the cash flow fluctuations are random, the banks can even them out overall through the law of large numbers. Thus overdraft and credit card lending represents a sizeable proportion of total private sector lending, exclusive of mortgage loans.

Reliance on unused overdraft facilities in the UK differs markedly between sectors. The Bank of England publishes statistics on committed credit facilities and on credit (lending) outstanding. The difference between the two is a good proxy for unused (or undrawn) facilities. These statistics are broken down by UK industries and credit to individuals (the latter includes credit card facilities). The data are available on the Bank's website (Table C1.2 in Bankstats). The overall figure derived (total facilities outstanding less total lending outstanding) for the latest date, July 2015, comes to about £417 billion, or 18.2% of total loans outstanding. However, reliance on unused overdrafts differs greatly between sectors, as shown in Table 2 below. It is very low in lending to other financial intermediaries, (except for insurance companies and pension funds) and to individuals on mortgages, (below 5%). It is much higher for lending to manufacturing, (nearly 120%), utilities (138%), trade (74%), transport and information (101%), construction (42%) and other (non-mortgage related) loans to individuals (62%). In short, if one strips out the network of intra-financial loans and the (massive) mortgage business, then the usage of committed, but undrawn, overdraft facilities is a central feature of the working of the British banking system.

Table 2
(from Bankstats C1.2)

July 2015
Lending in All Currencies

	Agriculture	Fishing	Mining & Quarrying	Manufacturing	Utilities	Construction	Wholesale & Retail	Accommo-dation
Amounts Outstanding	17,104	244	6,353	35,625	13,644	35,330	41,723	22,684
Amounts of Facilities Less Amounts Outstanding	6,535	66	26,411	42,261	18,839	14,975	30,825	5,953
2 as a % of 1	38.2%	27%	415%	118.6%	138%	42.5%	74%	26%

	Transport	Real Estate, Services & Support	Admin, Education, Health	Recreation	Financial Intermediation	Insurance Co. & Pension Funds	Auxiliary Financial
Amounts Outstanding	28,657	176,894	41,455	8,815	383,347	25,595	253,881
Amounts of Facilities Less Amounts Outstanding	28,867	51,557	8.833	3,891	37,524	9,125	4,433
2 as a % of 1	101%	29%	21.5%	44%	9.8%	35.5%	1.75%

	Total Financial & Non-Financial Businesses	Individuals Housing	Individuals Other Loans	Total Individuals Loans	Total UK Residents
Amounts Outstanding	1,091,352	1,083,111	120,139	1,203,250	2,294,602
Amounts of Facilities Less Amounts Outstanding	290,095	32,110	74,709	126,820	416,914
2 as a % of 1	26.6%	4.8%	62%	10.5%	18.16%

Unused overdraft facilities are as much immediate liquid purchasing power as bank deposits, as Keynes noted in his *Treatise on Money* (1930).[4] In principle one should consider aggregating the two together, but previously one could not do so because the UK banks had been unwilling to provide the data, (until quite recently). When the government tried to control bank lending by quantitative ceilings, prior to the Competition and Credit Control reform of 1971, one claim that the banks made was that they could not control such lending because it was pre-committed via overdraft facilities. So, as documented in Goodhart (2015b), the Treasury then, e.g. in the late 1960s, sought to ask the banks for data on

4 Ibid, pp 42-3,

such facilities, but the banks refused, (correctly fearing that the authorities would seek a quantitative limit on such facilities); the authorities, the Treasury and the Bank, did not, however, press the case then, possibly on the grounds that any limit on formal, legal, borrowing facilities might be avoided by their transformation into informal agreements.

Be that as it may, the timing and activation of much actual bank borrowing is done entirely at the initiative of the private sector borrower, not of the bank. Fluctuations in such borrowing are far from random. Thus, following the bankruptcy of Lehman Bros in September 2008, there was quite a large increase in bank lending to the private sector in the UK and Eurozone despite the sharp decline in activity, see Table 3. This was to some large, but unknowable, extent driven by borrowers' fears that banks might either become insolvent, (and therefore be unable to honour their overdraft commitment), or would seek as soon as possible to lessen the scale of their facility,[5] or to withdraw it entirely. It, therefore, became temporarily worthwhile to protect access to liquidity by paying the adverse spread, while shifting the resulting deposit to a safer bank. So in this quarter (Q4, 2008) there was the remarkable coincidence of a (temporary) surge in bank lending and deposits exactly at the time when the banking system

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> "The reader must notice that it is not the amount of the customer's used overdraft appearing on the asset side of the bank's balance-sheet, but the amount of his *unused* overdraft, which does not (at present) appear anywhere at all in a bank's statement of its assets and liabilities, which corresponds to a cash-deposit; — so that it is the total of the cash-deposits and the unused overdraft facilities outstanding which together make up the total of *Cash Facilities*. Properly speaking, unused overdraft facilities — since they represent a liability of the bank — ought, in the same way as acceptances, to appear on both sides of the account. But at present this is not so, with the result that there exists in unused overdraft facilities a form of Bank-Money of growing importance, of which we have no statistical record whatever, whether as regards the absolute aggregate amount of it or as regards the fluctuations in this amount from time to time.
>
> Thus the Cash Facilities, which are truly cash for the purposes of the Theory of the Value of Money, by no means correspond to the Bank Deposits which are published. The latter include an important proportion of something which is scarcely money at all (not much more than e.g. a Treasury Bill is), namely the savings-deposits; whilst, on the other hand, they take no account of something which is a Cash Facility, in the fullest sense of the term, namely unused overdraft facilities. So long as savings-deposits and unused overdraft facilities are both of them a nearly constant proportion of the total deposits, the figures of Bank Deposits as published are a sufficiently satisfactory index of the amount of Cash available. But if, as we shall see subsequently, these proportions are capable of wide fluctuations, then we may be seriously misled, as indeed many people have been misled, by treating Bank Deposits as identical with Cash."

5 The author's personal overdraft limit was summarily reduced by his bank in November 2008 from £10 thousand to £2 thousand.

was trying to cut back on facilities and new lending agreements as fast as it could. From the viewpoint of overall liquidity and purchasing power, it was the latter effect (rather than the former) that mattered. The banks were tightening terms and conditions of lending drastically in Q4 2008, and underlying liquidity was falling sharply then, not rising.

Table 3
Bank Lending to the Private Sector

	UK £ bn	Eurozone € bn
2008 Q2	2246	8786
Q3	2318	8928
Q4	2395	8953
2009 Q1	2462	8965
Q2	2422	8934

Sources: BoE, ECB

More generally, turning points in the cycle are frequently related to unexpected declines in sales and increases in inventories at the start of the downturn, and the reverse at the start of the recovery. So there is likely to be an unexpected shortfall in cash flow in the former case, and vice versa in the latter case. Then the unexpected cash flows may be, quite largely, met by calling on used overdraft facilities. This helps to explain why the contemporaneous relationship between changes in GDP and in bank lending is often counter-cyclical, although the relationship between GDP growth and lagged bank credit is strongly positive, see Jakab and Kumhof, (2015, p. 36).

To summarise, in dealing with the private sector, the commercial banking sector acts as a service industry, setting out the terms and conditions on which it will provide its financial services, notably including loan and mortgage provision. Given these, its private sector clients then make most of the running, determining the timing and amount of bank credit provision. The key variables are the banks' choice of such terms and conditions and the private sector's appetite for borrowing (on such terms) from the banks. Seen in this light, the claim that bank credit is the genesis of money creation without any mention of the private sector's key role in the process amounts to a misrepresentation.

That said, the banks' influence on the rate of growth of both loans and deposits, via shifts in setting their terms and conditions, can still be large and significant. Although the *level* of short-term interest rates is set by the monetary authorities, the *spread* between deposit and lending rates is controlled by the commercial banks; and this spread is generally found to be a significant factor in determining

the growth rate of both loans and deposits.[6] Similarly, changes in banks' risk aversion can trigger sizeable fluctuations in the provision of lending limits, both overdraft and credit card, and in required terms for collateral and margin. But, partly because time series data on unused facilities and lending terms are scarce,[7] the actual contribution of banks to the growth of loans and deposits has not been satisfactorily modelled, or even properly analysed.

C. Bank Finance of the Public Sector

A purchase by a commercial bank of public sector paper, a bond or a bill, creates money in *exactly* the same way as does a bank loan to the private sector. The bank buys the bond, say, and pays for it by crediting the seller with a cheque written upon itself. As noted earlier, the recipient of a loan is no more likely to keep the proceeds on deposit with the same bank than is the seller of the government bond to the bank.

But we tend not to think of bank lending to the public sector as being the initiating factor in creating money, in the same way as many do think of bank lending to the private sector as creating money. This is because banks are the passive residual providers of finance to the public sector. When the government runs a fiscal deficit, not covered by debt sales to the non-bank public, the excess spending is financed in the first instance by creation of monetary base, which mostly ends up in larger commercial bank deposits at the Central Bank. The commercial banks then, effectively, have the choice of how to distribute their portfolio of claims on the public sector between deposits at the Central Bank, Treasury Bills, short-dated bonds, etc. This latter portfolio choice will depend on relative expected rates of return, perceived (interest rate) risk, liquidity requirements, etc.

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6 N.B. If the spread goes to zero, it is rational for borrowers to both borrow and hold extra deposits until the marginal utility of extra liquidity goes to zero. If the spread rises indefinitely, borrowing will fall to zero.

7 US data on overdrafts and credit lines seem as scanty in the USA as in the UK. There is some limited data on consumer revolving credit, http://www.federalreserve.gov/releases/g19/current/g19.pdf, and on small business credit card use, https://www.frbservices.org/communications/payment_system_research.html, but not much else.

In our financial system, commercial banks cannot prevent themselves from acting as a buffer to absorb any excess financing need of the public sector. In dealing with the private sector, commercial banks do have an extra degree of freedom. They can vary the terms and conditions on which they will extend loans and financing facilities to private clients. But remember that one key element in such terms and conditions is the interest rate offered, and this latter is primarily under the control of the Central Bank, not of the commercial banks.

So just as the commercial banks provide a financial buffer to the public sector, so do they do so for the private sector, responding to fluctuations in the private sector's need for both credit and money, at an interest rate chosen by the authorities.

D. Comparison of the Various Approaches

Both the monetary base/money multiplier and the commercial banks as creators of money story share a common failing. They ascribe to the Central Bank and to the commercial banks a degree of activism in setting quantities, the monetary base and the volume of bank loans respectively, which these institutions in practice generally do not display. Instead, both the Central Bank and the commercial banks set interest rates, and terms and conditions, such as the requisite collateral (see Nyborg, 2015). Having set such terms and conditions, they then *react* in the short run, essentially passively, to the applications of both the private and public sectors for credit and money.[8] Of course, a significant change in the volume of bank credit and deposits may make both the Central Bank and the commercial banks respond by adjusting their terms and conditions for making loans. But then again it (the significant change in volumes) may not call forth such a response, as, for example, when the Central Bank focusses entirely on its inflation target, rather than the monetary aggregates, and when commercial banks are unconstrained by leverage, or other required, ratios. Indeed commercial bank margins (relative to the official rate) and other terms and conditions tend to be, often quite strongly, pro-cyclical, rather than contra-

8 Does this passivity enable one to describe banks as 'intermediaries', a description hotly denied by Jakab and Kumhof (op. cit.). This is a semantic issue which I prefer not to enter here.

cyclical, i.e. they lower their margins in a boom to sustain market share, and vice versa in a bust.

But it is not enough just to establish the facts, though theory ought to be consistent with fact, (though often it is not so in monetary economies, see Goodhart 2009). One ought to dig deeper to ascertain why both Central Banks and commercial banks act in this way. The answer, I would claim, is that this approach enables the Central Bank and the commercial banks both to achieve their own objectives *and* to respond flexibly to the desires of its clients. Banking is a service industry.

A Central Bank can vary its official short-term interest rate to hit its macro-economic objective, while, at the same time, by meeting all lending requests at that rate, handling (unpredictable) fluctuations in the demand for base money. The ECB's full allocation response to the Eurozone banking problems is a case in point. Recall that the Federal Reserve System was set up to establish 'an elastic currency'. There are many operational problems with monetary base control, see Foot, Goodhart and Hotson, (BEQB, 1979). Amongst these are that it makes the future time path of interest rates inherently less predictable and much more volatile, and that it cannot cope with the massive, and unforecastable, surges in the public's desire for liquidity during crises. Recall that the 1844 Bank Act was meant to impose an early version of monetary base control on the UK, but then had to be temporarily lifted in each of the following crises. Remember also that the monetary base in the United States rose sharply during the Great Depression, but not enough, because of the public's shift out of deposits into currency.

Similarly the overdraft, and committed facilities, system allows the private sector to be reasonably confident both about the future availability of funds and the likely path of future interest rates. Certainly no one knows the future, and forecasts are always wrong to some, often considerable, extent. But we tend to believe that we do know, even if only roughly, the authorities' reaction function. So we can make educated guesses at the future time path of rates. Indeed, the monetary authorities have become keen to provide 'forward guidance' on this. Such partial confidence about future financial conditions would dissipate under a 'narrow banking' system.

If the availability of (bank) loans was to be restricted, either by direct controls, or dependent on the ability of long-term funding institutions to raise longer-term

funding, as in the ‘narrow bank’ proposals, then not only would access to such loans for the individual borrower become far more uncertain, but also the going rate would become more volatile and less predictable. In short, the quality of financial services provided to the general public by the banking system would deteriorate. Banks’ raison d’etre is to provide attractive services to their clients, and any ‘reform’ that worsens such services will be opposed both by banks and their clients.

Those who propose the analysis that ‘bank credit expansion creates money’ tend to place the emphasis on the role of the banks as the active element. In our own story here we have emphasized the role of private sector borrowers in initiating the timing and, up to a limit, the amount of such borrowing, given the terms and conditions of borrowing. These terms and conditions are important, but a key term, the level of the short-term interest rate, is primarily determined by the Central Bank’s official rate.

For the rest, e.g. the margin over Bank rate and other requirements, such as collateral, there are two main determinants, the extent of competition in banking and the extent of risk aversion. The greater the competitive pressures, the lower margins and collateral requirements will be, and the more expansionary (in a boom) the banking system. While more competition, e.g. from challenger banks, is good for customers, it adds to systemic risk; remember Anglo Irish and Northern Rock. One reason why the Australian and Canadian banks did so comparatively well in the GFC was that their home banking markets were comfortably oligopolistic. While the promotion of challenger banks for the benefit of customers is all very well, a failure (as in the Vickers Report) to recognise its trade-off with systemic risk could be unfortunate.

No doubt the risk aversion of bankers has been procyclical, and this played some considerable role in the financial cycle. But it is not so clear that the procyclicality of bankers’ risk aversion was that much more marked and culpable that that of private sector borrowers, or of the authorities and of the regulators.

To conclude, the claim that banks create money when making loans is partially correct, but is only one step in a longer process. It ignores altogether the far more important prior, initiating, step when the private sector decides how much it wants to borrow, given the commercial banks’ terms and conditions, themselves strongly influenced by the Central Bank’s official short-term interest rate and the regulatory structure. Next, by placing undue emphasis on the

banks' responsibility for cycles in credit and money, this line of reasoning suggests that all would be well if only banks' credit creating powers were cabined and constrained; indeed, at the extreme eliminated altogether. This ignores the fact that the operational structure of banking has developed in order to provide valuable services to clients, and that effective reform should cover other financial markets, such as housing finance, as well as banking, and also should involve a larger role for the authorities to counter the financial cycle.

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Economic Thought 4.2: 20-31, 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

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Patrizio Lainà's paper, and our commentary here, reflect the perennial battle between the Currency and the Banking Schools.[1] The main contention of the Currency School is that the functions of money creation and financial intermediation not only are, but should be, separable, and only became entwined by a (reversible) accident of history whereby commercial banking developed on a fractional reserve basis in Europe, (i.e. an example of path dependence).

Thus Ronnie Phillips (1995) opens his book on '*The Chicago Plan and New Deal Banking Reform*', which is the main source of parts of Lainà's paper, as follows:

> 'In 1823 the great economist David Ricardo drafted a "Plan for the Establishment of a National Bank" that was published in February 1824, six months after his death. The document opened with the following statement:
>
> "The Bank of England performs two operations of banking, which are quite distinct, and have no necessary connection with each other: it issues a paper currency as a substitute for a metallic one; and it advances money in the way of loans, to merchants and others. That these two operations of banking have no necessary connection, will appear obvious from this – that they might be carried on by two separate bodies, without the slightest loss of advantage, either to the country, or to the merchants who receive accommodation from such loans (Ricardo, 1951, vol. 4, 276)"'

Phillips then goes on to show that Henry Simons, one of the founders of the Chicago Plan, explicitly modelled that on the 1844 Bank Act. Thus Phillips writes, (1995, p. 17):

> 'At one point Simons notes:
>
> "Your remark about the Bank of England reminds me that I got started toward this scheme of ours about ten years ago, by trying to figure out the possibilities of applying the principle of the English Act of 1844 to the deposits as well as to the notes of private banks. This Act would have been an almost

[1] The hey-day of this controversy was the 19th century. The best surveys are to be found in Arnon (2011) and Fetter (1965). The Currency School triumphed in the 1844 Bank Act, but the Banking School regained ascendancy by the end of that century. Currency School ideas have since resurfaced, perhaps temporarily, in the aftermath of the financial crises in the 1930s and in 2007/8.

> perfect solution of the banking problem, if bank issue could have been confined to notes (Simons to Fisher, January 19, 1934, Simons Papers)."
>
> 'Indeed a comparison of David Ricardo's "Plan for the Establishment of a National Bank," which served as a guide for the 1844 legislation, with the November 1933 Chicago memorandum indicates a striking similarity on several key points.'

One of the reasons sometimes put forward by Currency School advocates for this separation, though not emphasised by Lainà, is the claim that money creation should be a State monopoly,[2] so that having much of such creation done by private sector banks is, in some senses, an inappropriate transfer of seignorage from the public sector to private sector bodies. A problem with this position is that many of these same economists would probably also endorse the (invalid) Karl Menger (1892) theory of the creation of money as a *private sector* market response to the constraints of bartering, in which story the government only plays a subsidiary role.[3] Holding both positions simultaneously would seem to be logically inconsistent.

In any case the proposed separation of money creation and financial intermediation then leads on to the question of what should then determine the level and growth of the separately provided money stock. Here there is a stark divide between Currency and Banking School supporters. The Currency School supporters, almost to a man, propose rules, but a wide variety of rules: a gold standard rule (Ricardo, 1824), a k-percent rule (Friedman, 1960), a price level rule (Fisher, 1935), or an inflation target, or whatever the politicians want. Even nowadays, when there is an unusual degree of harmony around the maintenance of a 2% inflation target, there are those who challenge whether this target should be replaced by something else. Whereas supporters of the Currency School prefer rules, there remains much debate amongst them over which rule to adopt. Banking School proponents prefer discretion and flexibility.[4] No rule can take account of all eventualities. To Banking School adherents the financial system is evolutionary, not static,[5] and a rule adopted in one set of circumstances may soon become out-dated and inappropriate.

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[2] See Gaitskell (1933, pp 377-379) Here Soddy's moral argument is discussed by Gaitskell: 'The issuer of money gets "something for nothing" and it therefore should be the prerogative of the state to engage in such activity'. Also 'manufacture of currency used to be the privilege of the crown', the community alone should reap the benefits which the creator of money obtains. Also see Wolf (2014), Fisher (1935); and Jackson and Dyson (2013).

[3] Thus Desan (2014, p. 27) writes on 'The conventional creation story' that,

> 'Many narratives stage its start in the wild simplicity of an early world. In that conjured space, exchange was a murky broth of barter. People traded all sorts of objects among themselves – grain, gold, cows and hides, promises, services, cider, and salt. In the fluid mix of exchange, they found silver and gold especially easy to give and take. Metal gradually rose like fat to the surface, becoming a favored medium and marker of value as it passed endlessly from hand to hand. People cut silver and gold into pieces to make the process easier and more regular; disks of the commodity became coin. Its brokers were buyers and sellers converging upon pieces of precious metal to mediate each transaction and, ultimately, to create prices in a common medium.
>
> Content changes and the government assists as society becomes more complicated or bankers become more powerful – but the medium has a constancy across all those details that is clearly sourced in the primal spring of exchange.'

Also, see Goodhart (1998).

[4] For earlier examples, see Tooke (1844), Laidler (1972) and Arnon (2011, Chapter 12). For some more recent examples, see Modigliani (1977), Tinbergen (1952), Goodhart (1989) and Greenspan (1997).

[5] This can be argued by referring to the continuous evolution of banking legislation in the UK and the US as *The Economist* (2015) author writes: 'Another important issue for academics to consider is that the financial sector is not static. Each crisis induces changes in behaviour and new regulations that prompt market participants to adjust (and to find new ways to game the system).'

The 1844 Bank Charter Act subsequently had to be suspended during crises, and soon ceased to operate as initially intended. To Currency School supporters this was due to a (somewhat accidental) shift from notes to bank deposits as the main component of money. To Banking School adherents, there was nothing accidental about this shift; if the authorities try to impose constraints on the private sector's access to liquidity, it will attempt to innovate its way around that.[6] Crises have invariably found strict rules of money creation to be wanting (e.g. 1907 in the USA, 1914 in London, see Roberts, 2013), and have led to calls for 'a more elastic currency'. The adoption of 'full-allotment' by the ECB, and the introduction of a whole gamut of schemes by the Fed and Bank of England, to allow the banking system, and near-banks, to obtain the liquidity that they craved during the Great Financial Crisis (GFC), 2008/9, were typical examples of the application of Banking School principles.

It is somewhat odd in some ways that the 2008/9 GFC has called forth greater interest in FRB. Central Banks responded flexibly in unconventional ways to the GFC, leading to a huge increase in the monetary base. Had a rule-based money creation been in place, would we have got through it as well as we did? (Banking School) opponents of Currency School monetary rules believe that such rules will tend to be too inflexible, and quite often too deflationary.[7] For example, Ann Pettifor, (2013, p. 22), states that,

> 'Linking all current and future activity to a fixed quantity of reserves (or bars of gold, or supplies of fossil fuel) limits the ability of the (public and private) banking system to generate sufficient and varied credit for society's purposeful and hopefully expanding economic activity.'

Currency School advocates might respond by claiming first that, without a fractional-reserve banking system there would have been no crisis in the first place, and second that, with a price level, or even an inflation, target the money supply should have been forced to increase even more than it did.[8] Perhaps. One cannot help noting that many of those who prefer rules were worried that the increase in the money base was excessive, and would cause serious inflation if not now, then sometime in the future.

Be that as it may, the Banking School may lose a few battles (as in 1844), but usually wins the war. One reason for this is that the monetary authorities like to maintain discretionary control, and do not much want to be constrained by the rules that academic economists propose. Per contra, academic economists generally prefer rules to discretion. Even Tobin (1985; 1987) flirted with narrow bank proposals. Besides the time inconsistency argument, economists can devise rules that provide 'optimal' welfare in the context of their own models, which they naturally wish to proselytise.

Perhaps the main problem for followers of the Currency School (and FRB) is that, in order for their proposals to work, there needs to be a clear, hard and fast, distinction between 'money' and 'near-money'.[9] Let us take an example. Suppose that narrow, FRB, banks were

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[6] Tooke (1856), Arnon (2011, Chapter 12).

[7] Allen (1993, p. 715, footnote 49), writing on 'Irving Fisher and the 100% Reserve Proposal', records that Keynes declined Fisher's plea to become an 'advocate'.

> 'In my judgment deflation is in the near future a much more dangerous risk than inflation. I am afraid of your formula because I think it would, certainly in England, have a highly deflationary suggestion to a great many people. Apart from that, I am satisfied that in British conditions anyhow… we can obtain complete control over the quantity of money by means much less capable of exciting unfavourable comment and opposition." (Letter from Keynes to Fisher, July 7, 1944 [Yale].)'

[8] Jackson and Dyson (2013).

[9] Prior to 1844 the Currency School supporters did not recognise deposits as having any importance as circulating medium, while the Banking School advocates stressed the fact that only controlling bank notes was not sufficient (Fetter, 1965, p. 187).

established, while other (risky) banks continued to be allowed to offer seven-day time deposits, as now. Banks would still be able to make loans by writing up both sides of their balance sheet, only in the form of short-dated time deposits rather than demand (sight) deposits. Borrowers would have to wait a week before accessing their funds, but that is a short time for most purposes. It would, of course, make the use of credit cards considerably more expensive, since retailers would have to wait before getting paid, (n.b. debit cards could only be issued by narrow, FRB banks).

Such a system would be even more systemically dangerous than at present. As noted in Goodhart's earlier papers (1987 and 1993), private sector agents would shift the bulk of their liquid funds to risky banks during normal times. Such time deposits would have a higher return, better ancillary services (book-keeping, investment advice, access to credit, etc.), and could normally be switched back into claims on a narrow bank easily and just-in-time to make necessary payment.[10] *Per contra*, when fears about the solvency of risky banks arose during crises, (n.b. the standard Currency School proposal is to withdraw all deposit insurance and the public sector safety net from the risky banks), there would be a rush by private sector agents to switch funds from risky banks to FRB banks. Such a system would become even more terrifyingly pro-cyclical, indeed a recipe for disaster.

So, in order for the FRB system to work safely, banks would have to be banned from offering any form of liquid, short-maturity liability. Perhaps a one or three month time deposit, with a rigorously enforced (how?) penalty for early encashment, should be the most liquid liability which the risky banks could be allowed to offer. And what about marketable certificates of deposit? Would it be possible to impose a sharp and deep dividing line between the sight deposits of the FRB banks and the necessarily illiquid liabilities of the risky banks? And if such a division could be achieved, would not other intermediaries rush in to fill the gap? In a system without controls on international capital movements, and with electronic banking, banks situated abroad could still provide a full range of commercial banking in the domestic currency, transferring funds to and from the FRB banks instantaneously as and when a payment needed to be made. Even in a closed economy, a variety of non-banks (e.g. IT companies) could move easily to fill the gap in the liquidity spectrum needed to make the FRB, Currency School program work.

Henry Simons recognised this problem clearly, (unlike several of his colleagues, e.g. Irving Fisher; Simons comes across in Ronnie Phillips book as a particularly sensible economist). Thus Phillips (1995, pp 89-90) wrote:

> 'In a letter to Paul Douglas, Simons added the post-script:
>
> "Have been a little upset lately about the banking scheme – trying to figure out how to keep deposit banking from growing up extensively outside the special banks with the 100% reserves. Just what should be done, for example, to prevent savings banks (a) from acquiring funds which the depositors would regard as liquid cash reserves or (b) from providing through drafts a fair substitute for checking facilities? After all, it is important that the reform which we propose should be more than nominal! The problem can be dealt with, of course; but just what is the best combination of expedients?

[10] Governments have frequently provided narrow-type banks providing safe-keeping and payment functions, usually as a service to the otherwise un-banked poorer segments of the population. The Post Office Savings Bank (POSB) in the UK is an example. As a generality such narrow banks have rarely prospered when in open and free competition with commercial banks.

> Perhaps you will have some suggestions to pass on" (Simons to Douglas, January 25, 1934, Simons Papers).
>
> Continuing concern is also emphasized in a letter to Fisher in which he wrote: "Much is gained by our coming to regard demand deposits as virtual equivalents of cash; but the main point is likely to be lost if we fail to recognize that savings-deposits, treasury certificates, and even commercial paper are almost as close to demand deposits as are demand deposits to legal-tender currency. The whole problem which we now associate with commercial banking might easily reappear in other forms of financial arrangements. There can be no adequate stability under any system which permits lenders to force financial institutions into effort at wholesale liquidation, and thus to compel industry to disinvest rapidly – for orderly disinvestment on a large scale is simply impossible under modern conditions. Little would be gained by putting demand deposit banking on a 100% basis, if that change were accompanied by increasing disposition to hold, and increasing facilities for holding, liquid 'cash' reserves in the form of time-deposits. The fact that such deposits cannot serve as circulated medium is not decisively important; for they are an effective substitute medium for purposes of cash balances. The expansion of demand deposits,[11] releasing circulating medium from 'hoards,' might be just as inflationary as expansion of demand deposits – and their contraction just as deflationary; and the problem of runs would still be with us" (Simons to Fisher, July 4, 1934, Simons Papers)."'

Although Simons recognised the problem, neither he, nor anyone else, to the best of our knowledge, has ever managed to resolve it. It is the Achilles heel of the Currency School, and most proponents deal with it by ignoring it.

If it were possible to maintain such a gap between narrow money and illiquid risky bank liabilities there could be further structural problems. When a bank makes a loan, it expects the money to be spent and usually end up in another bank. But, unless it is expanding far faster than average, it will expect to get back its share of the available high-powered-money. Under the 'risky' bank system that reflux[12] could be expected to be far less; indeed that is the intention. If so, all lending which occurs at the initiative of the borrower, up to a pre-committed limit set by the bank, e.g. credit cards, overdrafts, etc., would either have to be withdrawn or made more expensive and less attractive. Indeed, there are concerns that such a system, with all risky bank lending financed by long-term liabilities, would not be in a good position to meet the short-term, working capital needs of industry. Thus Phillips, (1995, pp. 149-50), notes that,

> 'Thomas was concerned, however, that the 100 percent reserve system might lead to the total abolition of short-term lending, which would present difficulties for business borrowing over the business cycle (Thomas 1940, 318). During an economic downturn, a fall in loans would lead to increases in reserves of the lending institutions, thereby decreasing the money supply. This is why, Thomas notes, that the institutions offering savings and time

[11] Sic. He presumably meant 'time deposits'.
[12] Concern about the extent of such reflux is another hallmark of Banking School theorists, notably Fullarton (1844).

> deposits must be investment trusts without the privilege of making short-term loans (Thomas 1940, 319). The result, Thomas argued, would be to "drive a large volume of such borrowing into the field of trade credit."'

Moreover the longer term liabilities that the risky banks could offer would, because they would be less liquid, require a higher rate of interest. Such extra costs would get passed onto the borrower. So, the FRB system would result in a system of risky bank loans that would be both more expensive and less flexibly available. The private sector would find its access both to liquid assets and to borrowing from banks impaired. A FRB (Chicago Plan) supporter would, no doubt, claim that this would be a small price to pay if financial stability could be thereby ensured. But that would require a whole panoply of restrictions on the issuance of near-moneys, and/or banking abroad, and it is doubtful that they could be deployed.

Furthermore (investment) banks facilitate the smooth functioning of capital markets by using their balance sheets elastically to offset sizeable discrete shifts in market flows, e.g. by underwriting and managing IPOs in the primary market and by acting as market makers in secondary markets. If investment banks could not vary their books flexibly by adjusting their needs in short-term money markets, then capital markets would become less liquid with significantly higher transactions costs. The contribution of liquid secondary markets was also highlighted by Lavington (1934)[13] in his book *The English Capital Market*. He argued that liquidity draws forth more investment, as opposed to a less liquid market which would deter the risk averse investors, increasing financing costs. Keynes (1934, Chap. 12) also recognised the importance of liquid secondary markets despite the risk of speculation creating instability. The alternative would be increased hoarding and less available financing capital due to illiquid markets.

One of the great attractions of the Currency School (Chicago Plan, FRB, narrow bank) proposals, however, is their elegant simplicity. Separate money creation and intermediation between savers and lenders. Control money creation through some rule, and then leave intermediaries free to compete without government regulation or support. We have tried to demonstrate why this simple version is flawed. But you cannot beat something with nothing. What alternative structure does the Banking School have to offer? This is somewhat more difficult to set out clearly since the Banking School has traditionally been rather fuzzier in its proposals.[14] This is partly because Banking School adherents have been more inclined to work backwards from practical empirical observation towards general principles, whereas Currency School have tended to work forwards from certain theoretical axioms to more general conclusions. But, perhaps, the Banking School can be represented as generally holding the following beliefs, (Arnon, 2011):

- In the spectrum of liquid assets there is no clear gap between monetary assets and quasi-monetary assets;
- The determination of the money stock (any definition) is largely endogenous;
- Causation runs as much from the macro-economy to money, as vice versa;
- Credit creation is the key link between money and the real economy; control over credit creation is vital, but difficult.

[13] Also see Toporowski (2005).
[14] Viner (1932, p. 220) and Fetter (1965, p. 191).

Instead of rules the Banking School tends to aver that the various monetary aggregates should respond flexibly to the 'needs of trade'.[15] This is best done by having the Central Bank set its interest rate to achieve some macro-economic target, (e.g. the Gold Standard, via the Palmer Rules, but not blindly following them), or an Inflation Target (via the Taylor Reaction Function, again using judgment), and then meeting all commercial banks' demand for reserves at this chosen rate. Thus the monetary base becomes an endogenous variable, and the money multiplier works in reverse to determine H, *not* M. Similarly, given the official short rate set by the Central Bank, commercial banks should set their terms and conditions for lending, and then meet the needs of all potential borrowers who can satisfy those conditions.

This is, of course, broadly how modern monetary systems work, i.e. according to Banking School precepts. But there is an inherent problem with it; this is that borrowers and banks tend to behave pro-cyclically, getting over-excited and over-optimistic in booms and too risk averse in busts.

Banking School supporters used to think that they had a well-designed response to this, in the guise of the 'Real Bills Doctrine'.[16] Unlike nowadays where most bank lending is property related, in the 19th century under the Anglo-Saxon banking model, most bank lending went to industry to finance trade, inventories and working capital. [17] If trade increased, then output would increase in line, and under the Quantity Theory, the monetary aggregates could increase alongside without any increase in prices.[18]

The opposite of a 'real bill' was (not a 'nominal bill' but) a speculative, or a 'finance' bill, drawn not against productive trade and output, but for a speculative investment in an asset which was hoped to rise in price. Thus the counterpart instrument (to the choice of interest rate) which a Central Bank would use, prior to the 1930s, to maintain financial stability was to assess the quality of private sector bill finance in the money market, and to discriminate against low-quality finance bills, e.g. both by refusing to discount them and by communicating its warnings to the relevant market participants.

This 'real bill' doctrine had numerous advantages. At a time when data were scarce and Central Banks were, in most cases, unable to supervise commercial banks directly, it played to a Central Bank's strength as the key player in the money market. The doctrine unified macro-monetary policy, (an increase in M based on expanded trade will not be inflationary), and financial stability policy (preventing an expansion of 'finance' bills will constrain boom and bust), to a degree never subsequently achieved.

But the real bills doctrine was, unfortunately, wrong.[19] In a boom, trade can expand and unemployment fall, beyond the sustainable level leading to subsequent upwards pressures on prices and inflation. Much more important, if a severe depression should occur, trade will contract to a point where the Central Bank will not be presented with sufficient trade bills to discount to generate enough cash/liquidity to return the economy to equilibrium. The

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[15] See Arnon (2011) for 19th Century discussions on this. More modern writers include Kaldor (1986), and Moore (1981; 1988).

[16] For a concise guide to this doctrine, see Green (1989). It was a key pillar of the Banking School, e.g. Fullarton (1844) and Tooke (1844), and has been consistently attacked by the Currency School from Ricardo and Thornton (1802) onwards.

[17] In the 19th, and earlier centuries, increases in government expenditures were usually war-related. Wars did not increase real incomes and output. Hence bank lending to governments was regarded as inherently inflationary.

[18] 'If the loans or discounts are advanced on proper banking securities, for short periods, the reflux of the notes, if any have been issued, will be equal to the efflux, leaving the circulation unaltered. If, indeed, the transactions of the district, or the trade of the country generally, require more instruments of exchange, a larger amount of notes would remain out; but this increase of the outstanding circulation would be the effect of increased transactions and prices, and not the cause of them' (Tooke, 1848, p. 194. Also see, p. 185).

[19] Although wrong, it had some illustrious forebears, notably Smith, (1776, Chapter 2) 'Of Money'; also see Arnon (2011, Chapter 2).

Federal Reserve System had been created in 1913 specifically to operate along procedures established by the Banking School 'real bills' doctrine.[20] 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). Part of the attraction of the Currency School's Chicago Plan in the 1930s was not only the purported merits of the scheme itself, but also a general acceptance of the claim that (in the USA at any rate) the 'real bills' doctrine of the Banking School had not only failed, but had failed disastrously.[21]

In so far as there is a current analogue to the 1930s failure of the 'real bills' doctrine, it probably lies in the failure of bank regulation to prevent the prior boom and subsequent GFC bust in 2008/9. Currency School supporters express doubt that regulation can ever achieve a satisfactory balance between control and evolutionary growth. Would it not be better to have a tightly managed, protected, core payments/monetary system, and then allow intermediation outside those limits to be largely unregulated, and unsupported by any safety net? The Currency School arguments are certainly seductive, which is, of course, why they persist in 2015, just as they did two centuries ago.

Indeed the Vickers Report in the UK (2011) is suffused with Currency School ideas. To an adherent of the Banking School, the attempt to separate money from near-money assets, or money issuing entities from other intermediaries will prove illusory and self-defeating. And the idea that the money-issuing bodies should be protected by the public sector safety net, while the rest, e.g. the risky investment banks, can be left to the mercy of the market and the operation of special resolution and bankruptcy laws, is just wrong. Recall that Lehman Bros did not offer demand deposits, and in 2008 was not even classified as a bank!

For the Banking School the essential requirement is that the quality, i.e. maturity, risk, etc., of an intermediary's assets should match that of its liabilities. If the liabilities are very short-term and of fixed value, then the assets should also be liquid, subject to little price variation, with enough equity backing to meet any expected declines in asset prices.[22]

A basic problem has been that the banking sector has departed massively from such Banking School precepts. Instead of making short-term, self-liquidating loans to industry, it is now making long-term, illiquid, property-related, mortgage loans to individuals, and on commercial real estate. Meanwhile banks' own liquid assets were massively run-down under

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[20] See Meltzer (2003, pp 69-71); Bordo and Wheelock (2013); Calomiris (2013); Sissoko (2015).

[21] Lloyd Mints (1945), a Chicago-based monetary economist, wrote in the Preface of his book, *A History of Banking Theory*, that,

> 'Monetary theory is a matter of paramount importance in a free-market economy; but, to the present time, banking legislation has been too much controlled, in the United States at any rate, by the belief that a restriction of the banks to the making of loans for bona fide commercial purposes will automatically provide for all needed variations in the means of payment. This belief, which I have called the "real-bills doctrine," is utterly subversive of any rational attack on the problem of monetary policy. If there is a central theme in what I have written, it is that this doctrine is unsound in all its aspects.'

[22] In the April 1861 edition of *The Economist*, in the article on 'How to read Joint Stock bank accounts', Walter Bagehot (1861) warned against judging a bank primarily on the adequacy of its capital and reserves. Rather, 'we should add together all the liabilities of the bank – its circulation, its drafts, and its deposits: see what the total is carefully; and then we should compare it with the amount of cash, loans to bill brokers, Government securities, and other immediately tangible and convertible assets which the bank has in hand. If the available money bears a good proportion to the possible claims, the bank is a good and secure bank'. On the question of 'the specific proportion between the cash reserve and the liabilities of the bank to the public', Bagehot refused to 'lay down any technical or theoretical rule upon it'. The cash ratio must be allowed 'to vary in some degree with the nature of the bank's business'. Not for Bagehot rigid control of the banking system through operations on the cash base and a stable multiplier. But then, the Banking School was a family matter for him; he had married Eliza Wilson, daughter of James Wilson, an early member of the Banking School and founder of *The Economist* in 1843. See Arnon (2011, p. 245).

the influence of the myth that any bank can always borrow necessary cash from wholesale markets. Their equity capital was, furthermore, way below that necessary to ride out a housing bust.

There is overwhelming evidence that the GFC, and indeed most post-WWII financial crises, have been the result of an interaction between cycles in the housing market and bank credit expansion, see the many papers by Jorda, Schularick and Taylor.[23] It is this nexus that needs fundamental reform, (in addition to the needed rebuilding of equity capital and liquid assets). Indeed one effect of the Vickers Report will be to focus the assets of the ring-fenced retail banks even more heavily on residential mortgages, thereby making the system even riskier.

One reason why there has been so little attention paid to the deleterious effect of allowing banks to fill their portfolios with long-dated, illiquid mortgages was that the encouragement of house-ownership has been, in most developed countries, a major plank of government policy. So, getting banks to finance home-ownership was consciously encouraged by (various aspects of) government policy (Wallison, 2015). Rather than do a thorough review of housing finance, with the aim of returning bank balance sheets to their traditional composition, it is easier to leave the housing/bank credit nexus untouched while blaming investment bank 'culture' and toxic exotic derivatives for the GFC, and supposing that (hesitant) moves towards separation in the banking sector will do the trick. It will not do so.

Meanwhile, the perennial battle between the Currency and the Banking Schools will continue, as the contents of Lainà's paper and our commentary on it indicate.

Acknowledgements

This commentary has received helpful contributions from David Laidler, Duncan Needham and Carolyn Sissoko.

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[23] For example, see Jordá, Schularik and Taylor (2014; and 2015).

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SUGGESTED CITATION:

Goodhart, C. A. E. and Jensen, M. A. (2015) 'A Commentary on Patrizio Lainà's "Proposals for Full-Reserve Banking: A Historical Survey from David Ricardo to Martin Wolf". Currency School versus Banking School: An Ongoing Confrontation.' *Economic Thought*, 4.2, pp. 20-31.
http://www.worldeconomicsassociation.org/files/journals/economicthought/WEA-ET-4-2-GoodhartJensen.pdf

Economic Thought 4.2: 1-19, 2015

Proposals for Full-Reserve Banking: A Historical Survey from David Ricardo to Martin Wolf[1]

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Abstract

Full-reserve banking, which prohibits private money creation, has not been implemented since the 19th century. Thereafter, bank deposits became the dominant means of payment and have retained their position until today. The specific contribution of this paper is to provide a comprehensive outlook on the historical and contemporary proposals for full-reserve banking. The proposals for full-reserve banking have become particularly popular after serious financial crises.

Keywords: full-reserve banking, monetary reform, sovereign money, Chicago Plan, history

1. Introduction

Under full-reserve banking (FRB) private money creation is prohibited. Today it would mean that banks could no longer create new money in the form of bank deposits in the process of bank lending. In other words, every deposit would be backed by government money (i.e. cash, central bank reserves and government securities) or a commodity (e.g. gold). FRB aims at separating the payments system from the financing system, as well as separating monetary policy from credit policy.

FRB has been proposed and even implemented as a solution to financial instability a number of times in the past. Thus, the idea of monetary reform should be seen as a historical continuum. In the UK the Bank Charter Act of 1844 prohibited private money creation through fractional-reserve banking by requiring that bank notes (which were the prevailing means of payment) should be fully-backed by government money. The National Acts of 1863 and 1864 achieved the same goal in the US.

The prohibitions, however, did not include bank deposits, which slowly became the dominant means of payment. In the 1930s, the Chicago Plan was almost adopted in the US, but the FRB idea was watered down in the Banking Acts of 1933 (better known as the Glass-Steagall Act) and 1935. Instead of preventing private money creation in the form of bank deposits, the Banking Acts separated commercial and investment banking, provided deposit insurance and improved government's control over monetary policy and money supply. Currently there are no examples of economies where the majority of money does not come into existence as a consequence of bank lending.

Now, in the aftermath of the Global Financial Crisis (GFC), preventing private money creation in order to ensure financial stability has once again become a topical issue. For

[1] The research of this paper has been funded by the Ryoichi Sasakawa Young Leaders Fellowship Fund (SYLFF) and the Finnish Cultural Foundation. The author is the Chair of Suomen Talousdemokratia (Economic Democracy Finland), which is an association promoting full-reserve banking.

instance, Martin Wolf (2014a; 2014b), the chief economics commentator at the *Financial Times*, supports FRB openly; in 2015 the Green Party in the UK included FRB in its political agenda; Iceland's Prime Minister commissioned a report authored by Sigurjonsson (2015) on FRB; and bills to implement FRB have been put forward in the US and UK.

The scope of this paper is to chart the history of FRB proposals from the 19th century until today. I will focus on the FRB proposals put forward in the US and UK, although other countries are not entirely excluded. The reason for this is that the US and UK are at the heart of global (financial) capitalism and, since World War II, have been a key influence setting global financial standards through international institutions – such as the International Monetary Fund (IMF) and the Bank for International Settlements (BIS).

The discussion on the consequences of FRB is excluded from this paper. It would be too demanding in terms of length to go to the wider literature which debates the advantages and shortcomings of FRB. Nevertheless, it could be mentioned that, for example, Goodhart (1987; 1993), Kregel (2012), Dow et al (2015) and Fontana and Sawyer (2015) provide academic critiques of FRB.

The specific contribution of this paper is a comprehensive mapping exercise of the history of FRB proposals. Although Ronnie Phillips (1994a) laid down much of the groundwork – especially for the New Deal period – such a survey on historical and contemporary proposals for FRB has not been conducted before, especially including the recent new wave of FRB proposals sparked by the GFC.

As Table 1 below illustrates, there are different versions of FRB. A pure commodity standard was the first type to emerge in the 19th century. Sovereign money was proposed before the Great Depression in the 1920s and it has probably become the most popular alternative since the GFC. The Chicago Plan was of high standing academically and politically during the New Deal banking reforms in the 1930s. Deposited currency was an innovation of the mid-1980s. Narrow banking emerged as an alternative during the Savings and Loan Crisis of the late 1980s. The most recent newcomer is limited purpose banking in the mid-1990s. In the following sections I will go through and elaborate on these various FRB types in chronological order.

This paper is structured as follows. In section 2 I will present the first FRB proposals starting from David Ricardo. In section 3 I will move to the Chicago Plan outlined in 1930s during the New Deal banking reforms before discussing the FRB proposals of the latter half of the 20th century in sections 4 and 5. In section 6 I will present the recent new wave of FRB proposals following the GFC. Finally, in section 7, I will draw some concluding remarks.

Table 1. Different types of full-reserve banking

	Pure Commodity Standard	**Sovereign Money**	**Chicago Plan**	**Deposited Currency**	**Narrow Banking**	**Limited Purpose Banking**
Features	All money, including bank deposits, backed by a commodity such as gold (in all other types backed by government money).	Deposit banks can make loans only by attracting savings or using own capital.	Deposit banks provide only payments services and cannot make loans.	Full-reserve requirement applied only to certain deposits. Other (not fully-backed) deposits not guaranteed. Individuals choose which type of deposits to hold.	Banks' assets restricted to 'safe' by some standards.	Banks become unleveraged mutual funds. Banks' liabilities restricted to equity.
Notes	Associated to Austrian school.	Associated to Positive Money, New Economics Foundation and ecological economics.	Associated to 'old' Chicago school and monetarism.	For example, postal saving system or central bank accounts for the general public.	Less restrictive proposals not counted as FRB.	Instead of banks, all risks are born by investors.
Proposals	Ricardo (1824), Mises (1912), Hayek (1937), Rothbard (1962), Huerta de Soto (2009)	Soddy (1926; 1934), Currie (1934; 2004), Daly (1980; 2013), Rowbotham (1998), Huber and Robertson (2000), Yamaguchi (2010; 2011; 2014), Jackson and Dyson (2012), Kolehmainen et al (2013), Farley et al (2013), Wolf (2014a; 2014b), Lainà (2015b), Green Party UK (2015), Sigurjonsson (2015)	Knight et al (1933), Simons et al (1933), Fisher (1935), Douglas et al (1939), Simons (1948), Friedman (1948; 1960; 1969), Benes and Kumhof (2012; 2013)	Tobin (1985; 1987), Jessup and Bochnak (1992), Gruen (2014), Lainà (2015a)	Kareken (1986), Litan (1987), Spong (1996), DeGrauwe (2008), Kay (2009), Phillips and Roselli (2009), Flaschel et al (2010), Chiarella et al (2011)	Pollock (1993), Kotlikoff (2010), Cochrane (2014)

2. First Steps: David Ricardo and Others

The first proposal for FRB can be traced back to David Ricardo. In 1823, Ricardo (1824) drafted a 'Plan for the Establishment of a National Bank' in which he argued that money creation should be separated from lending by requiring the issuing department to hold 100 percent in gold reserves. Ricardo's plan was a full-reserve plan – but it accepted only gold as reserves. The plan was published in 1824, six months after his death.

Ricardo's (1824) plan was a **pure commodity standard** proposal. Unlike in a regular commodity standard – such as the gold standard effective until the 20th century – in a pure commodity standard *all money*, including bank deposits, is backed with the commodity. In a regular commodity standard only *base money* (i.e. cash and central bank reserves) is backed with the commodity.

According to Phillips (1994a), Ricardo's plan served as a guideline for the Bank Charter Act of 1844. As described earlier, the Bank Charter Act (passed in the UK in 1844) effectively implemented FRB. The Act required full-backing of bank notes – which were the dominant means of payment at the time. However, in addition to gold, as suggested by Ricardo (1824), notes could also be backed with government debt. Nevertheless, the Act did not cover bank deposits. Hence, over time banks were able to substitute bank notes with bank deposits. This, in addition to the fact that the Act was suspended whenever a real panic occurred in the subsequent 25 years, slowly led to the deterioration of FRB in the UK.

The National Currency Act of 1863 and the National Banking Act of 1864 implemented a FRB requirement for all national banks in the US. According to McCallum (1989, p. 318), these Acts required national bank notes to be 111.11 percent backed by government bonds (so it was even more than *full*-reserve banking as it imposed a 111.11 percent reserve requirement). Later, according to White (1983, p. 11), Congress imposed a 10 percent tax on any new issuance of bank notes by state-chartered banks. This led banks, both national and state-chartered, to reduce the issuing of bank notes. As in the UK, the US banks were, nevertheless, able to undermine the reform by increasing their issuance of demand deposits.

Ludwig von Mises (1912) presented his brief proposal for FRB arguing that there are two reasons why FRB should be adopted. Firstly, the use of fiduciary money (i.e. money that represents dual sides of a balance sheet) would be destabilising and, secondly and more importantly, human influence on the credit system would be eliminated. As cash and central bank reserves are also fiduciary money, it is quite obvious that Mises is arguing for a full-reserve gold standard (or some other metal standard). Thereby, the FRB proposal of Mises substantially resembles Ricardo's pure commodity standard of almost a century earlier.

The origins of later **sovereign money** proposals can be traced back to Frederick Soddy. He was a Nobel Prize winner in chemistry in 1921, but he was also an economist. Soddy (1926) pointed out the difference between real wealth (buildings, machinery etc.) and virtual wealth (money and debt). Real wealth is subject to inescapable entropy laws of thermodynamics (depreciation), while virtual wealth is subject only to laws of mathematics (compounding at the rate of interest instead of depreciating). As a solution to this imbalance Soddy (1926; 1934) suggested FRB. Soddy's economic views, however, were largely ignored by his contemporaries.

Even though it was implemented in the 19th century both in the UK and in the US, FRB was unable to endure as near-money emerged and finally replaced bank notes as the dominant means of payment. This near-money, known as bank deposits, continues to occupy the position of the main means of payment.

3. Chicago Plan: on the Policy Agenda

During Roosevelt's New Deal banking reforms, FRB re-emerged in the form of the Chicago Plan. The Chicago Plan was presented as a way out of the Great Depression as well as providing a long-term reform of the financial system. This section is divided into three subsections. First, I outline the proposals for the Chicago Plan. Second, I present legislative

initiatives implementing the FRB principle. Third, I describe academic reactions to the Chicago Plan.

3.1 Proposals

The first version of the **Chicago Plan** was provided by Knight et al (1933) in the Chicago Memorandum of March 1933. The memorandum was from Garfield Cox, Aaron Director, Paul Douglas, Albert Hart, Frank Knight, Lloyd Mints, Henry Schultz and Henry Simons and it was signed by Frank Knight. All were members at the University of Chicago. Later Douglas became a senator and is still known in economics for the Cobb-Douglas production function. The recipient of the memorandum was Henry Wallace, the Secretary of Agriculture.

In short, the proposal would require FRB in currency and central bank reserves, which would be backed by government debt in the books of the Federal Reserve Banks. The detailed proposal included 1) federal ownership of the Federal Reserve Banks, 2) giving Congress the sole power to grant charters for deposit banking, 3) a two-year transition period for deposit banking, 4) creation of a new type of deposit bank institution with a 100 percent reserve requirement in notes and deposits at the Federal Reserve Banks, 5) abolition of reserve requirements for Federal Reserve Banks, 6) replacement of private credit with Federal Reserve Bank credit within a two-year transition period, and 7) restricting currency to only Federal Reserve notes. As deflation was the pressing economic problem of the time, one of the short-term objectives of the proposal was reflation (a term coined by Irving Fisher to indicate inflation after deflation) of wholesale prices by 15 percent, until a long-run currency-management rule could be established. As a long-run currency-management rule the group proposed different versions of the stabilisation of money supply (either total quantity M, total circulation MV, or per-capita total circulation MV/N; where M is the money supply, V is the velocity of circulation and N is the number of inhabitants).

According to Phillips (1994a), Wallace handed the Chicago Memorandum of March 1933 to President Roosevelt two and half weeks after his inauguration. The Chicago Plan was also sent to a number of other recipients including John Maynard Keynes. According to Phillips (1994a), Keynes briefly expressed his interest in the plan, but did not elaborate his views in more detail.

The second version of the Chicago Plan was provided by Simons et al (1933) in the Chicago Memorandum of November 1933. The memorandum was signed by the same group, but, according to Phillips (1994a), it was evidently written only by Henry Simons. The revised Chicago Plan included the same items as the March 1933 version, but added a simple rule for monetary policy and a price-level target set by Congress. It was argued that monetary policy should be subject to a rule instead of being discretionary. The goal could be, for instance, price stability, steady growth of the money supply, or some other goal specified by Congress. The proposal included neither deposit insurance, as deposits would already be fully secured by the reserves backing them, nor a central bank discount window – as banks would always be able to settle their payments and credit availability was not seen as a potential problem. In addition, the proposal rejected the gold standard.

Proponents of FRB can also be found within the US administration. In 1934, Secretary of Treasury Henry Morgenthau appointed Jacob Viner to assemble a group to come up with ideas involving money, banking and public finance. The group was referred to as the ‘Freshman Brain Trust’. It included, among others, Lauchlin Currie and Albert Hart, who were open advocates of FRB, and Jacob Viner who was at least sympathetic to it. Later that year, Currie became a personal assistant to the governor of the Federal Reserve Board, Marriner Eccles.

Lauchlin Currie (1934) submitted his proposal for FRB to Morgenthau in 1934. In Currie's **sovereign money** proposal, banks would initially meet the 100 percent reserve requirement with a non-interest-bearing note from the Federal Reserve Banks. The note could be left outstanding indefinitely or alternatively the note could be retired over a period of time from five to 20 years by turning over government bonds to the Federal Reserve Banks. As the discount window would be abolished, the money supply could only be affected by open market operations. Currie (1934) was against an independent monetary authority as he argued that democracy should apply to monetary policy as well. As his memo from 1938 reveals, Currie (2004) continued to develop the idea of FRB. Another proposal for FRB, emanating from within the administration, came from Gardiner Means (1933) who was working at the Department of Agriculture.

According to Sandilands (2004), Currie had a major influence on the administration version of the Banking Act of 1935. Phillips (1994a) argued that Currie did not, however, suggest FRB should be included in the administration version of the bill, as he saw it as politically unacceptable. According to Phillips (1994a), Currie compromised on the 100 percent reserve goal, and, in the end, his compromise prohibited any possibility of such a reform being achieved in the future. Nevertheless, Currie was able to include in the administration version of the bill that the Federal Reserve Board would have unlimited power to alter the reserve requirements – with a view to them eventually being raised to 100 percent. Senator Carter Glass, however, was able to rewrite the bill in Congress to limit the Fed's ability to raise reserve requirements higher than 30 percent. It goes without saying that this prohibited any attempt to raise the reserve requirement to 100 percent.

President Roosevelt and Irving Fisher, according to Phillips (1994a), were frequently in touch. Roosevelt requested Fisher to provide comments on his economic policies. Phillips (1994a) argued that Fisher first became aware of FRB as he was handed the Chicago Memorandum. Fisher was working on his own version of the Chicago Plan and provided a draft of his book *100% Money* to Roosevelt. Afterwards, according to Phillips (1994a), Fisher urged Roosevelt to consider the proposal a number of times. Roosevelt and Fisher continuously exchanged letters on FRB and Roosevelt even showed some interest in it, but he was not willing to embrace the reform as the bankers were opposed to it. Nevertheless, Roosevelt forwarded Fisher's draft to his Secretary of Treasury, Henry Morgenthau.

In 1935, Irving Fisher published his own version of FRB. Fisher's (1935) book *100% Money* was largely in line with the Chicago Plan, but it differed somewhat in its policy target. Fisher proposed a price-level stabilisation rule instead of stabilisation of monetary aggregates.

3.2 Legislation

Legislation to implement FRB was introduced during the New Deal reforms. It is worthwhile noticing that FRB was already made possible by the Emergency Banking Act of 1933. The Act permitted banks to offer deposit accounts backed with cash, central bank reserves or government bonds. In other words, these deposit accounts operated according to the FRB principle. There were, of course, other deposit accounts as well and, thus, only a small fraction of deposits became fully-backed by government money. For the banks, the full-reserve requirement of these accounts was easy to satisfy as the Fed flooded the banking system with excess reserves by changing its policy to issue reserves against almost any assets of the banks.

The idea of FRB was also practiced without legal obligations on bank-level. According to Phillips (1994b), John M. '100%' Nichols put the theory fully into practice by successfully operating a bank according to the FRB principle for over a decade.

There were also bills to fully implement FRB nationwide. According to Phillips (1994a), Henry Simons outlined and Robert Hemphill drafted a bill, largely based on the Chicago Memorandums, for Senator Bronson Cutting and Congressman Wright Patman. They introduced the bill S. 3744 'A bill to regulate the value of money' (H.R. 9855) in 1934. The goal of the bill was to correct the shortcomings of the Banking Act of 1933, which did not address the problem of the availability of credit and how to effectively control the money supply. As Phillips (1994a) put it: 'Deposit insurance made banks "safe" not by direct restrictions on their assets, but rather by the promise that the government would guarantee a percentage of the deposits in all banks, good and bad.' In other words, deposit insurance succeeded in stopping bank runs, but it did not address the second primary function of banks: funding the capital development of the economy.

The bill would have made lawful cash money and bank deposits fully-backed with either central bank reserves or government securities. The bill proposed 1) to segregate demand deposits from savings deposits; 2) to require banks to hold 100 percent reserves against their demand deposits; 3) to require banks to hold 5 percent reserves against savings deposits; 4) to set up a Federal Monetary Authority (FMA) with full control over the supply of currency, the buying and selling of government securities, and the gold price of the dollar; 5) to have the FMA take over enough bonds of the banks to provide 100 percent reserves against demand deposits; and 6) to have the FMA raise the price level to its 1926 level and keep it there by buying and selling government bonds.

Senator Cutting was, according to Phillips (1994a), personally disliked by President Roosevelt. This was one reason why the bill did not gain the support of the administration and, consequently, did not pass. Later, however, the bill was reintroduced as S. 2204. A significant blow to the FRB legislation came in May 1935, during the fierce debate over the Banking Act of 1935, when Senator Cutting died in an airplane crash. For the last time the proposal for FRB was introduced by Senator Nye, but his amendment was defeated. The Banking Act of 1935 was a watered down version of Cutting and Patman's bill and – although reforming some aspects, for instance, allowing the Federal Reserve to alter reserve requirements and making deposit insurance permanent – it did not reform money to become fully-backed by government money. Although the Chicago Plan was not adopted, it did have a significant influence on the New Deal legislation. To sum up, the Banking Acts of 1933 and 1935 gave the government better control over monetary policy and the money supply, but not full control over the money supply.

Phillips (1994a) gave four reasons why the FRB proposal was not adopted: 1) the administration blundered in its handling of the banking legislation as it did not keep Senator Glass up to date; 2) the public was ill-informed; 3) Senator Cutting died; and 4) the Banking Act of 1935 was not believed to be the final New Deal banking legislation. Phillips (1994a) added that bankers were against the Chicago Plan as it was seen to reduce their profits. They resisted any changes to the *status quo*, unless it could be demonstrated that the new system would be even more profitable. Whittlesey (1935, p. 23) was pretty much of the same opinion as he saw that the proposal was opposed because free services of banks would no longer be free, and bank owners would lose their main source of profits.

3.3 Academic Reactions

Only after the Banking Act of 1935 had passed did the Chicago Plan start to generate widespread academic interest. Most academic discussions were sympathetic to the plan: there were concerns about transition and details, but the goals were widely seen as desirable.

Douglas (1935), Whittlesey (1935), Hart (1935), Graham (1936) and Higgins (1941) advocated FRB but they emphasised different reasons. In Angell's (1935) version, the government would place a lien on the total assets of the banks equal to the value of new currency received. Service charges would be avoided by banks paying a specified amount to a common pool and then receiving money from the pool relative to their demand deposits.

Watkins (1938, 44) cited Keynes: 'Those (monetary) reformers, who look for a remedy by creating artificial carrying-costs for money through the device of requiring legal-tender currency to be periodically stamped at a prescribed cost in order to retain its quality as money, or in analogous ways, have been on the right track.' Watkins (1938, 44) argued that FRB would be the analogous way that Keynes meant, as it would raise service charges.

Douglas et al (1939) circulated a paper which claimed that FRB was supported by nearly 300 economists while disapproved by only 43. The paper was written by Paul Douglas, Irving Fisher, Frank Graham, Earl Hamilton, Willford King and Charles Whittlesey and it included many of the previous features of the FRB proposals. According to Allen (1977, p. 586), two years later the group also included John R. Commons and the supporters had grown to some 400 economists.

Hayek (1937), on the other hand, revived the **pure commodity standard** proposals. In his pure gold standard proposal, deposits should not be backed with government money, but only with gold. Otherwise Hayek's proposal resembled the original Chicago Plan.

The pure commodity standard type of FRB proposal is sometimes associated with 'free banking'. However, some free banking proposals are, by definition, excluded from being FRB proposals as there are no reserve requirements at all. Other proposals, such as Hayek's (1937), argued for 'free' banking with full gold backing. Apparently, 'free' means in this context 'free from any governmental control' as banks could not freely issue money.

Although FRB might sound like a radical solution now, at the time it was presented as a moderate alternative to the nationalisation of the whole banking system (see e.g. Simons 1948, pp. 332-333; Douglas 1935, pp. 184-187; and Watkins 1938, p. 11). Today it might also sound peculiar that demands for FRB came from the University of Chicago whose economics department is known for *laissez faire* policy prescriptions. According to Phillips (1994a), the founders of the Chicago School of Economics – Frank Knight, Henry Simons, Jacob Viner and Lloyd Mints – were indeed proponents of *laissez faire* in industry, but at the same time they did not question the right of the government to have an exclusive monopoly on money creation.

4. Post-World War II: Academic Developments

After World War II, the atmosphere for reform was again propitious. Congressman Jerry Voorhis introduced a bill H.R. 3648 in 1945 to create a Monetary Authority as the sole creator of money. According to Phillips (1994a), Voorhis worked closely with Fisher who, by 1946, had received over 1100 positive responses out of 4662 members of the American Economic Association willing to endorse FRB (with no response from most of the members). However, the end of the political possibilities for FRB came in the 1946 elections when Congressman Jerry Voorhis from California was defeated by Richard Nixon.

In academia FRB was, nevertheless, not abandoned. After Irving Fisher died, Henry Simons (1948) continued to argue for the **Chicago Plan** and Lloyd Mints (1950, pp. 186-87) suggested his proposal.

Maurice Allais presented his version of FRB in 1948 in French. His views were not published in English until 1987 in Allais (1987). Allais's proposal resembled previous versions of the full-reserve plan, but differed in some important respects. He argued that banks should be required to borrow long and lend short, whereas at the time (and still now) they borrowed short and lent long.

Friedman (1948) suggested eliminating the private creation of money and the discretionary control of the money supply by the monetary authority. This would also mean the elimination of the discount window. Friedman (1948) argued that the chief function of the monetary authority should be to create money to meet government deficits, or destroy money when the government has a surplus. In a later proposal, however, Friedman departed from this view.

Friedman's (1960) later proposal departed from the Chicago Plan by demanding that interest should be paid on reserves – because FRB would be, according to Friedman (1960), effectively a tax on the banking system. Friedman (1960, p. 74) argued that paying interest on reserves would reduce the incentive to evade the full-reserve requirement and to create near-monies. Friedman (1960, p. 65) also argued that holders of money balances and holders of government securities should be equally compensated. Friedman (1960, p. 70) saw 'no technical problem of achieving a transition from our present system to 100% reserves'.

Friedman (1969, p. 83) agreed with Simons's FRB plan, but for different reasons. Friedman's (1969, p. 83) aim was to reduce government interference in lending and borrowing and to allow greater freedom in the variety of borrowing and lending arrangements.

Rothbard (1962) argued that the central bank should be abolished and we should adopt a 'free banking' system. However, Rothbard suggested gold as the only eligible asset to back deposits. In other words, he proposed a **pure commodity standard**. Rothbard's 100 percent gold standard proposal is thus very similar to Hayek's (1937) proposal.

5. Turn of the Millennium: More Creative Ideas

After Friedman, FRB lost its interest in the academic world and among policy-makers for a couple of decades. Proposals for FRB were, however, revived at the turn of the millennium, which generated more creative proposals such as deposited currency, narrow banking and limited purpose banking. Of course, there were also more traditional proposals including government money or gold as the asset to back deposits.

James Tobin's (1985; 1987) **deposited currency** proposal included the establishment of a currency functioning according to the FRB principle, while allowing other deposits as well. Thus, Tobin's (1985; 1987) deposited currency can be seen as optional or 'limited' FRB. In other words, only a fraction (whose size would be determined by the actions of various economic agents) of demand deposits would function according to the FRB principle.

In addition to Tobin's deposited currency, there were also other 'limited' FRB proposals. Jessup and Bochnak (1992) proposed reviving the postal savings system. According to O'Hara and Easley (1979, p. 744), funds in the postal savings accounts could only be invested in government securities or placed in solvent national banks. Thus, the postal saving system can be seen as a limited implementation of FRB.

The turn of the millennium also saw proposals for **narrow banking** (sometimes called core banking). Narrow banking, a term coined by Litan (1987), allows any 'safe' asset to be the balancing item of bank deposits. The safe assets can be anything from central bank reserves to traditional bank loans such as mortgages – depending on the proposal. Indeed, some of the narrow banking proposals are so permissive that they could not be labelled as FRB proposals. However, Litan (1987), Kareken (1986) and Spong (1996) would impose such strict restrictions on bank assets that they *would* qualify as FRB proposals.

Gordon Getty, according to Ferguson (1993), wanted to replace the financial system controlled by the Fed with a parallel system of mutual funds. Pollock (1993), on the other hand, suggested reviving mutual savings and loan associations, which would restrict the funding of investments to equity or shares. These types of FRB proposals are labelled **limited purpose banking**. Mutual fund shares would be effectively money backed by the asset portfolio. There would be no government insurance and no guarantee of par value clearance. Instead of banks, individuals would carry the risks. This would be a full-reserve system, but neither in government liabilities nor in commodities.

While Hotson (1985) and Schemmann (1991) wanted to carry out the **Chicago Plan** in a more modern context, Islamic banking was also discussed as an alternative way to organise the monetary system. According to Phillips (1994a, pp. 208-209), Islamic banking, which forbids charging interest, is also one type of FRB. Khan and Mirakhor (1985), Khan (1986; 1988) and Doak (1988) provide a detailed discussion on the connection between FRB and Islamic banking.

In 1998 Huerta de Soto (2009, ch. 9) proposed a **pure commodity standard** following a very liberal line of argument from the Austrian school. He proposed a FRB system which would offer total freedom of choice in currency; implement free banking; and abolish central banking. Thus, Huerta de Soto's proposal is built especially on the FRB proposals of Ludwig von Mises (1912), Friedrich Hayek (1937) and Murray Rothbard (1962) who opposed any monetary system in which the government would have significant influence on monetary policy – either through interest rates or the quantity of money. As Hayek (1937) and Rothbard (1962) demanded FRB only in gold, Huerta de Soto (2009, p. 739) made the same argument for a pure commodity standard although after the initial transition to a 100 percent gold standard he was willing to accept 'the spontaneous and gradual entrance of other monetary standards' as well.

Daly (1980), and other ecological economists, finally revived Soddy's (1926; 1934) **sovereign money** version of FRB. Rowbotham (1998) concentrated on a holistic analysis of the current monetary system and on the reasons for monetary reform, but he also presented his version of how to concretely implement the sovereign money system. According to Rowbotham (1998), the fraction of government money should be gradually increased either through government spending or basic income.

Huber and Robertson (2000) presented the first detailed proposal for sovereign money. Their main argument was that seigniorage revenue should be restored as the sole privilege of the government. Hence, all new money would be issued as public revenue and it would be spent into circulation by the government.

6. Aftermath of the Global Financial Crisis: Back to the Policy Agenda

The GFC sparked a new wave of proposals for, and academic research on, FRB. Recently, Martin Wolf (2014a; 2014b), the chief economics commentator at the *Financial Times*, supported FRB openly; the UK parliament debated on money creation; Switzerland is

preparing a referendum on FRB; Iceland's Prime Minister commissioned a report on FRB; and bills to implement FRB have been put forward in the US and UK. FRB has indeed become a timely topic again.

Firstly, in this section, I outline the contemporary proposals for FRB. Then, I describe legislative initiatives and civil movements advocating FRB. Finally, I present academic modelling of FRB.

6.1 Proposals

Positive Money probably presents the most detailed version of FRB so far in Jackson and Dyson (2012). Positive Money's **sovereign money** proposal is written in the UK context and it has been endorsed by *Financial Times* columnist Martin Wolf (2014a). Kolehmainen et al (2013) is my co-authored proposal which adapts a sovereign money proposal for Finland.

Jackson and Dyson (2012) argue that money should be an asset to the holder, but not a liability to anybody. Contrary to previous FRB proposals, Jackson and Dyson (2012) and its former version Dyson et al (2011) suggest that deposits should be treated off-balance sheet in accounting. That is, all deposits would be held in custody at the central bank (although they also provide an alternative treatment where deposits would be held on-balance sheet at the central bank). They argue that coins in the US are actually treated in this way even today.

The transition from the current banking system to FRB would be done in an overnight switchover in Positive Money's proposal. Jackson and Dyson (2012) adopt Currie's (1934) proposal that demand deposits would be replaced in the balance sheets of banks with a 'conversion liability', which banks would have to repay to the central bank over a ten-to-20-year period of time. The objective of the conversion liability would be to reclaim seigniorage revenue from previously issued deposits back to the government. Thus, their proposal is in line with Huber and Robertson's (2000) previous proposal.

In Jackson and Dyson's (2012) system there would be two types of bank accounts. Current accounts called 'transaction accounts' and savings accounts called 'investment accounts'. No money would be actually held in savings accounts as the money would be transferred from an economic agent's current account to a bank's 'investment pool', which is the bank's current account for making loans. Savings accounts are thus promises by banks to pay money after a certain period. Jackson and Dyson (2012) introduce as a catch-all requirement that a bank must be able to repay the total sum of its current accounts at any time. This would effectively prevent any money creation by banks.

Jackson and Dyson (2012) propose that an independent body would decide how much new money should be created in order to prevent political abuse. The newly created (destroyed) money would simply be added to (subtracted from) the government's budget and, subsequently, a political body such as parliament would decide how the newly created money would be used (collected). Basically, there are four alternatives: increase government spending, cut taxes, make direct payments to citizens or pay off the national debt. Additionally, in order to avoid a credit crunch in some circumstances money could be created by lending it to banks on the condition that they re-lent it to the real economy. The monetary policy target would be unaffected unless decided otherwise. That is, the independent body responsible for money creation would target inflation.

Besides supporting Positive Money's FRB proposal in Wolf (2014a), Martin Wolf also came out with his own proposal. Otherwise Wolf's (2014b) proposal resembles to a large extent Positive Money's sovereign money proposal but it would also strongly increase capital requirements.

Herman Daly (2013) follows the arguments of Frederick Soddy (1926; 1934) and Lauchlin Currie (1934; 2004). He justifies FRB by arguing that it would better service a non-growing or de-growing economy. In addition, he argues that seigniorage revenue should entirely go to the government. In his sovereign money version of FRB monetary policy should be subject to parliamentary decision-making instead of being independent. Farley et al (2013) continue Daly's ecological justification of FRB.

Mayer's (2013a) proposal concentrates on the euro area and turns the established order of the EU Banking Union upside down. EU Banking Union means the establishment of a Single Supervisory Mechanism (SSM), Single Resolution Mechanism (SRM) and common deposit insurance scheme for the euro area (and an opt-in possibility for non-euro area EU states). Until now only SSM has been achieved as the ECB took over financial supervision of the largest banks from national supervisors in November 2014. SRM, which may require laborious change of the EU Treaties, is only being planned. Moreover, common deposit insurance has been postponed into the indefinite future.

Mayer (2013a) argues that the EU Banking Union should have been established starting from common deposit insurance, then SRM and finally SSM. Instead of governments guaranteeing bank deposits, Mayer suggests that FRB should be adopted to make deposit insurance obsolete. After that, according to Mayer (2013a), establishment of SRM and SSM would be more straightforward and the EU Banking Union would be more functional.

In addition, Mayer (2013b) provides seven accounting options for the central bank for how new money can be brought into circulation under FRB. For example, new money could be issued through negative equity. This would mean changing only the liabilities side of the central bank's balance sheet when issuing money. As the central bank cannot go bankrupt, it can operate with negative equity without any problems.

The idea of **deposited currency** was revived after the GFC by Gruen (2014) with his elaborate proposal. In Lainà (2015a) I make a similar proposal to allow central bank accounts[2] for all economic agents in Finland.

Also **narrow banking** has been recently proposed as a solution by DeGrauwe (2008), Kay (2009) and Phillips and Roselli (2009). In DeGrauwe's (2008) proposal narrow banks would be precluded from investing in equities, derivatives and complex structured products. Nevertheless, he does not explicitly determine the assets valid for backing deposits. Phillips and Roselli (2009) would allow government securities – in addition to central bank reserves – as the balancing assets. DeGrauwe (2008) suggests that maturity mismatch would not be allowed for any financial institutions other than narrow banks (i.e. the average duration of other financial institution's liabilities should equal the average duration of their assets). According to DeGrauwe (2008), if only a few countries would implement narrow banking, the banks of these countries would face a competitive disadvantage. Consequently, DeGrauwe (2008) demands also international coordination in order to avoid a regulatory race-to-the-bottom.

Kotlikoff (2010), on the other hand, suggests **limited purpose banking**, a variant of FRB in which each pool of investments made by a bank would be turned into a mutual fund. This would mean that there would be no maturity mismatch between a bank's assets and liabilities. In other words, banks would not be leveraged at all and they would be pure intermediaries between borrowers and lenders. Kotlikoff (2010) admits that it could lead to irrational collective exuberance (financial instability), but he argues that risks and rewards would be better aligned. Banks could not fail as they are not leveraged. Losses would be

[2] According to Godley and Lavoie (2006, p. 102), in some countries individuals are allowed to hold deposits at the central bank and, thus, already have a deposited currency.

absorbed by investors. The Bank of England's former governor Mervyn King (2010) discusses FRB and shows cautious support for it – especially for Kotlikoff's version.

Also Cochrane (2014) argues for limited purpose banking. As bank deposits are run-prone liabilities of banks, Cochrane (2014) argues that banks should be funded 100 percent with equity. According to Cochrane (2014), technology is already available for allowing everybody to sell assets (such as equities) and obtain fully-backed money instantly. Cochrane(2014) sees capital requirements as inefficient regulation and proposes taxing short-term bank debt instead in order to test whether run-prone liabilities are really worth having around. Furthermore, Cochrane (2014) argues that the central bank should include everybody as its counterparties when issuing reserves.

6.2 Legislation and Civil Movements

After Congressman Jerry Voorhis was defeated by Richard Nixon in the 1946 elections, there had not been any legislative initiatives to implement FRB in the US until the GFC. However, in 2011 Congressman Dennis Kucinich introduced a bill H.R. 2990 'National Emergency Employment Defense Act' (NEED Act) to implement FRB in the US. The draft version of the bill was known as the American Monetary Act. The bill, however, failed to pass.

In 2010 in the UK, a Member of Parliament, Douglas Carswell, introduced a short bill 'Financial Services (Regulation of Deposits and Lending)' which, in effect, would implement FRB in the UK. Unsurprisingly, the bill did not pass. Positive Money (2013) has drafted a much more detailed bill to implement FRB in the UK, but it has not been introduced yet.

The UK parliament, nevertheless, debated on money creation for the first time in 170 years on 20 November 2014. The debate was entitled 'Money Creation & Society'. Although no voting on legislation followed the debate, it certainly raised awareness of the monetary system and its alternatives among members of the UK parliament. Indeed, in the following year, the Green Party UK (2015) included FRB in their political agenda in their general elections manifesto.

Iceland is considering how to concretely put the idea of FRB into practice. Iceland's Prime Minister, Sigmundur David Gunnlaugsson, commissioned a report authored by Frosti Sigurjonsson (2015). The report has a chance to lead to legislation which would implement FRB in Iceland.

Sigurjonsson's (2015) report is very similar to Jackson and Dyson's (2012) proposal, but it gives more precise numbers. For instance, Sigurjonsson (2015) suggests a 45-day minimum maturity or notice period for time deposits. He would also set the interest rate on the conversion liability equal to the average current interest rate on demand deposits in order to avoid making banks better or worse off than in the current system.

Worldwide there are a number of political parties, NGOs and civil movements demanding FRB. Reforming money to function according to the FRB principle is one of the main goals of the following political parties: Green Party (UK), Money Reform Party (UK), Canadian Action Party (Canada), Humanwirtschaftspartei (Germany), Alternativet (Denmark) and Democrats for Social Credit (New Zealand). In Switzerland, Vollgeld-Initiative (Sovereign Money Initiative in English) is a project preparing a referendum on adopting FRB.

The International Movement for Monetary Reform is an umbrella organisation for national NGOs and civil movements propagating the idea of FRB. In addition to Positive Money in the UK, there are many national NGOs and civil movements advocating FRB, for instance, American Monetary Institute (US); Progressive Money (Canada); Sensible Money (Ireland); Fair Money (Australia); Positive Money NZ (New Zealand); Monetative (Germany); MoMo (Switzerland); Ons Geld (Netherlands); Monnaie Honnête (France); Moneta Positiva

(Italy); Dinero Positivo (Spain); Boa Moeda (Portugal); Dinero Justo (Puerto Rico); Positiva Pengar (Sweden); Gode Penge (Denmark); Betra Peningakerfi (Iceland); and Suomen Talousdemokratia (Finland).

6.3 Academic Modelling

Although in recent years there has been a revival of interest in FRB, it has so far been modelled little and with mixed methods. Indeed, it was never formally modelled until the GFC. After the GFC, FRB has been modelled in a dynamic stochastic general equilibrium (DSGE) framework, in a system dynamics framework, in a dynamic multiplier framework and in a stock-flow consistent (SFC) framework. Regardless of the diverse modelling approaches, according to the results, the consequences of adopting FRB seem to be widely positive. Next I will briefly go through these modelling results.

Benes and Kumhof (2012) conducted their study at the IMF and used the methodology of neoclassical economics – DSGE modelling – to reach the same conclusions as Irving Fisher (1935) almost eight decades earlier. According to Benes and Kumhof (2012), FRB would 1) provide better control of money supply and bank credit, which are a major source of business cycle fluctuations; 2) eliminate bank runs; 3) reduce public debt; and 4) reduce private debt. Furthermore, they found that output would increase by almost 10 percent and inflation could be dropped to zero without causing any problems. Later, Benes and Kumhof (2013) revised their paper but the results remained unchanged.

Yamaguchi (2010) modelled the NEED Act, and later refined the modelling in Yamaguchi (2011; 2014), using accounting system dynamics approach. Yamaguchi (2010; 2011; 2014) found that, in stark contrast to the current monetary system, under FRB government debt can be liquidated without triggering recession, unemployment or inflation.

Flaschel et al (2010) and later Chiarella et al (2011) showed in a dynamic multiplier framework that FRB provides a more stable financial environment than the current fractional-reserve banking system – even if appropriate monetary policy is conducted. Furthermore, they showed that under FRB a sufficient loan supply can be guaranteed (and that bank runs do not occur, which should be obvious, since the logic of FRB makes bank runs redundant).

Most recently, in Lainà (2015b) I modelled FRB in a SFC framework popularised by Godley and Lavoie (2006). I found that FRB can accommodate a zero growth economy and provide both full employment and zero inflation. In addition, FRB would not cause credit crunches or excessively volatile interest rates. Not surprisingly, money creation through government spending would lead to a temporary increase in real GDP and inflation. More surprising, however, is that money creation would also lead to a permanent reduction in consolidated government debt.

Until now, there are only a few attempts to model FRB – and even those have been conducted very recently. The results of various modelling methods seem to be tentatively promising – at least for proponents of FRB. However, for more general conclusions, more modelling is required.

7. Concluding Remarks

This paper provided a comprehensive outlook on historical and contemporary proposals for FRB. FRB was first proposed by David Ricardo in 1823. Ricardo's proposal served as a guideline for the Bank Charter Act which implemented FRB in the UK in 1844. Two decades later, FRB was also implemented in the US. Nevertheless, bank deposits slowly replaced

bank notes fully-backed with government money. Since then, bank deposits have remained the dominant means of payment.

The FRB proposals have become particularly popular after serious financial crises, especially the Great Depression and the GFC – which both sparked a number of proposals for FRB. The supporters of FRB included many prominent economists such as Irving Fisher, Milton Friedman, Herman Daly and James Tobin. One of the most recent proposals came from Martin Wolf, the chief economics commentator at the *Financial Times*.

Acknowlegements

This paper has received useful comments from Sheila Dow, Charles Goodhart, Lauri Holappa, Stefano Lucarelli, Heikki Patomäki, Roger Sandilands, Jan Toporowski and Matti Ylönen.

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SUGGESTED CITATION:

Lainà, P. (2015) 'Proposals for Full-Reserve Banking: A Historical Survey from David Ricardo to Martin Wolf.' *Economic Thought*, 4.2, pp. 1-19. http://www.worldeconomicsassociation.org/files/journals/economicthought/WEA-ET-4-2-Laina.pdf