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Review Essay

Sound Money without Free Banking: Revisiting Economic Principles

Better Money: Gold, Fiat, or Bitcoin?

Lawrence H. White
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Professor Lawrence H. White is one of the founders of the modern free-banking school and a major scholar of monetary theory and history. In *Better Money: Gold, Fiat, or Bitcoin?*, he draws on close to four decades of scholarship to answer the question of which monetary standard would be better. It should come as no surprise that Professor White sees the contest as mainly between gold and bitcoin.

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What constitutes a "better" money? Professor White proposes that this must be judged from a "non-paternalistic" perspective—that is, from the viewpoint of the money holders themselves. This is surely the correct approach. He lays down two analytical criteria: a money must serve as a convenient and low-cost medium of exchange, meaning that it has nondeclining and predictable purchasing power; and the monetary system as a whole should have desirable properties such as avoiding depressions associated with monetary disequilibrium (17; page numbers refer to the digital edition). While the approach and the first criterion are eminently sensible, the second criterion is much more questionable.

In the course of the book, Professor White first gives a concise overview of monetary history (chapter 1) before describing and assessing the different standards—gold, fiat, and bitcoin (chapters 2–5) and finally comparing gold and bitcoin directly (chapter 6). Readers familiar with White's earlier work will recognize the theoretical apparatus (e.g., the discussion of the workings of the gold standard from his *Theory of Monetary Institutions* [1999]). However, there's still plenty of new material even for the well-read economist, and for the newcomer Professor White has here provided a great synthesis of monetary economics in the free-banking tradition. The book is also a good introduction to the economics of bitcoin.

In his direct comparison between gold and bitcoin (sections 6.4 and 6.5), Professor White concludes in favor of gold. The volatility and the transaction costs of bitcoin both count against its success, although White sees possible solutions in second-layer payment services, and bitcoin online payment services outperform the use of gold online. Overall, however, he finds that a monetary regime based on gold would handle shocks, especially demand shocks, much more efficiently. Bitcoin's fixed supply is, in White's analysis, a decided liability as compared to gold, the production of which expands when increased demand pushes up its purchasing power. Since a money-producing free-banking system can also serve this function (section 2.11), perhaps a bitcoin standard complemented by a free-banking system would fare better than gold. However, White does not consider this possibility.

Readers of this journal might wonder how this book fits into debates on monetary theory and free banking. Professor White

has plenty to say on these issues, throughout advocating unapologetically for the superiority of free banking and criticizing its opponents. The rest of this review will therefore be taken up with critical remarks on issues of money and banking theory, not simply to revive old debates, but because analysis of the different monetary standards depends on the analyst's preconceptions. Even if one shares Professor White's conclusion that a gold standard is preferable, arguments for such a position can be, at important points, very different.

THAT'S NOT HOW A GOLD STANDARD WORKS

White lays out the working of the gold standard with admirable clarity in chapter 2. He explains that, setting out from an equilibrium position, an increase in the demand for money (gold) will increase its purchasing power. Gold will therefore tend to move from nonmonetary to monetary use. Over time, this will stimulate additional production of gold, so that the purchasing power of money falls back to its original level. An increase in the demand for money is thus long-term fully compensated by an increase in its supply, leading to a stable price level or purchasing power. A decrease in the demand for money will similarly be offset by a fall in the supply of monetary gold as gold is shifted to nonmonetary uses, since the opportunity cost of nonmonetary use of gold in terms of monetary use falls. Conversely, an increase in the production of gold will increase the stock of monetary gold, leading to a fall in gold's purchasing power. This fall will stimulate industrial demand for gold until a new equilibrium is reached where the stock of monetary gold is greater at a lower purchasing power and the flow of new gold is matched by industrial demand.

This model of the gold standard works well in showing the basic dynamics of money production, especially in making clear that gold production is not an external shock to the system but rather a natural consequence of the demand for gold. However, Professor White goes too far in three respects: in the economics of his model, in his description of the shortcomings of metallic currency, and in his critiques of bimetallism.

The Economics of the Gold Supply

White's model of the gold standard rests on the assumption of constant costs of gold extraction (153). This assumption is not much elaborated, although White does deal with the possibility of costs increasing due to the depleting of mines. However, more should be said on this issue. In fact, constant costs seem to be the wrong assumption when dealing with changes in the demand and supply of money.

At the outset, rising marginal costs are surely more realistic. If the mine owner adds one more factor of production to his mine, say an additional laborer, what will be the effect? The law of returns shows that the additional laborer will not increase the output proportionally; rather, the productivity of the marginal worker will be lower. Since he does produce *some* extra gold ore, this constitutes an additional supply in the market. Hence, the price the miner receives for his gold will fall, while his costs will rise, since his extra demand in the labor market will tend to push up wages. Thus, in equilibrium, the mine owner will face rising marginal costs, and this will also be true when he scales up operations (rather than only hiring more workers), thus keeping physical returns constant, for he will still face lower revenues and higher costs.

The process of accommodation to a change in the demand for money is therefore somewhat different from White's depiction. In reality, as the demand for money increases, the purchasing power of money increases. This increases the profitability of mining, and mine owners, even facing rising marginal costs, will expand production. However, a rise in the value of money at the same time liberates the resources necessary for increased gold production. An increase in the demand for money and a higher purchasing power of gold, after all, mean lower demand for goods and services and lower prices. As the prices of consumer goods fall, entrepreneurs lower their bids for the factors of production, leading to lower prices for the factors of production. The mine owners therefore now face lower prices in the markets for the complementary factors of production, which stimulate more intensive exploitation of the mines in the short term. Over time, stimulated by the profits to be made, entrepreneurs will explore, discover, and open new gold mines; the production of gold will expand; and the purchasing power of gold will stabilize.

While there is thus a tendency for the value of gold to first rise in response to increased demand and then, as production increases, to fall, the value will not fall back to the exact level as before. For the value of gold to fall back to the initial level, a specific, constant shape of the money supply curve must be assumed; yet this has not held true historically and is unlikely to hold true now. The value of money is not this stable in the long run, as prices constantly fluctuate to greater or lesser degrees. The costs of production for gold are not constant throughout the long period of production.

Despite this critique of his description of gold production, White (136) admirably shows that changes in the gold supply are endogenous to the monetary order. It is reasonable to interpret, as White does, a historical rise in the stock of monetary gold of 1–2 percent per year as due to increased demand for gold. However, in the late nineteenth century, as White himself reports, the increased demand for gold was not exclusively satisfied by increased supply—the purchasing power of gold became permanently (a little) higher.

As Hülsmann (2000) wrote in a review of a previous book by Professor White (1999), "The supply of money does not have to be adjusted to the demand of money. Unlike all other commodities, money itself constantly adjusts to the conditions of the market. The services rendered by any unit of money are constantly adjusted under the impact of changes in demand and supply of money." That is to say, the services money renders are linked to its purchasing power. This is what differentiates money from all other goods. On a gold standard, or any standard of market-provided commodity money, both the supply and the value of money will adjust to changes in the data of the market (Hansen and Newman 2022).

The Problems of Coinage

A second problem in Professor White's analysis concerns the alleged difficulties of using metallic coins (105–10). Professor White can of course be forgiven for giving only a superficial summary of these issues, since his book is not a general treatise on all things monetary. However, his remarks, which are part of his general argument for the superiority of bank money and free banking over a gold standard that excludes the use of fiduciary

media, leave out important considerations. White argues that metallic coins suffered from limited durability, lack of uniformity, lack of portability (in the case of silver, since the larger quantities of silver needed to make large payments made such payments impractical and costly to transport), and lack of divisibility (in the case of gold, since the coins would have to be impractically small to use as small change; the use of silver coins in a bimetallic system would solve this problem, however).

From the beginning of the monetary economy in the Middle Ages, coins were never 100 percent durable. They tended to become lighter over their years in use, a problem made worse by sharp operators who deliberately reduced the weight of coins before passing them on. However, this in itself is really only a minor nuisance: it was and is not that costly to weigh coins. What transformed it into a major problem was government involvement and the operation of Gresham's law: bad, legally overvalued money drives out good, legally undervalued money. The sovereigns of the different countries decreed that a coin stamped a penny should be accepted on par with all other coins so stamped by the royal mint. The market would have dealt with the lighter coins by simply having them circulate at a discount to full-bodied coins. Where kings could enforce their decrees, however, this became impossible, and instead full-bodied coins tended to disappear from circulation. It became almost customary to have a great recoinage once a generation or so, simply to ensure a uniform coinage. But the problem was created entirely by the monopoly mint and royal decrees, not by the lack of durability of the coins (Spufford 1988, 312, 316–18).

The number of different currencies in medieval Europe—all were silver coins of different weights and in different states of debasement—is astounding. It would therefore seem that this lack of uniformity would impose huge costs and inconveniences on trade. However, this was not the case, for two principal reasons. First, credit institutions were—or became—well developed during the High Middle Ages. Merchants would not buy and sell in the coins of the different jurisdictions they came through; rather, trade was organized around a few major hubs—Antwerp, Bruges—and commercial fairs, the fairs of Champagne being the most famous. Merchants would keep accounts in the reliable money of either their hometown, a key commercial center, or the fair they were

visiting. Only at the end of the fair would they settle their accounts, usually in a reliable, agreed-upon currency, but in any case always in amounts of gold or silver according to weight and fineness. Merchant-bankers developed the bill of exchange to lower the costs of trade (Spufford 1988, 262; de Roover 1953; 1963). Second, international merchants were never faced with this problem of lack of uniformity. Gold and silver were money, not the different currencies. International trade was therefore carried on in terms of silver bullion (until the fourteenth century) and gold coins (Spufford 1988, 209–22). The gold coins used—Venetian ducats and Florentine florins being prime examples—did not present any problem of lack of uniformity. On the contrary, the few changes there were to the main medieval gold coins were simply to bring them into conformity, to introduce a de facto "ducat standard" no matter the issuer of the coin (Spufford 1988, 320–21).

The lack of portability of silver was solved by the use of gold (the question of parallel standards is taken up in detail in the next section). It is true that there is a technical limit to the divisibility of silver where it becomes difficult to use as currency because the coins become too small to be easily recognizable. This limit was overcome historically through the use of debased, so-called black money (Spufford 1988, 332–34). For example, a coin that was 90 percent base metal and 10 percent silver was still only valued for its metallic content and could therefore be used as small change. Ironically, therefore, the scourge of debasement solved the "big problem of small change." The concurrent use of gold and credit instruments for long-range trade and silver and debased silver coinage for small purchases evolved over time to deal with the problems proposed by White. A free market in money functioned successfully for centuries before the rise of modern banking and fiduciary media.

Bimetallism

The problem of small change leads us, along with Professor White (110), into the question of bimetallism. In presenting this issue, White suggests a scenario where the U.S. dollar is used for payments of five dollars and up and the Canadian dollar is used for payments under five dollars. Since the exchange rate between the U.S. and Canadian dollar varies, this system has the drawback of

exposing people to large swings in the value of money: you might never know the value of your small change.

Bimetallism presents two variants: a system of parallel standards, where gold and silver are both used as money and the gold-silver exchange rate is set by the market, and bimetallism proper, where the monetary authority mints both gold and silver coins of the same currency at a fixed exchange rate. As already noted, the parallel standard was arguably the monetary order that evolved in Europe to deal with the shortcomings of gold (lack of divisibility) or silver (lack of portability) alone. To be sure, it was in reality a system of many bimetallic (in the proper sense) jurisdictions, but it functioned practically as a parallel standard due to the limited power of most medieval realms.

Is a parallel standard as cumbersome and costly as White suggests with his example using U.S. and Canadian dollars? This is a matter of historical understanding, and one where this reviewer's judgment differs considerably from that of Professor White. The U.S. and Canadian dollars, first of all, are both fiat currencies. They are therefore both subject to the extreme fluctuations in supply characteristic of such money. The example is therefore not well chosen to illustrate how a parallel standard based on metallic currencies can and did function.[1] Second, on a parallel standard the demand for both currencies is likely to be higher—certainly, in White's example, the demand for Canadian dollars would be higher, since they would be demanded as small change by all economic actors in the U.S. Demand for U.S. dollars in Canada would also be higher, and demand for the two currencies would no longer be independent, since their use would now be more integrated. This would arguably limit the fluctuations in the exchange rate; therefore the historical exchange rate cannot be used to show the problems of the hypothetical USD-CAD parallel standard.

The remarkable fact about the actual performance of gold and silver is the stability of the exchange rate, not its fluctuations. It is true that the silver/gold rate fluctuated between 10:1 and 16:1, but this was over centuries; any change in the relative value of silver

[1] There are, however, examples of the parallel use of fiat currencies. In the border regions and along the highways of Switzerland, for instance, it is possible to pay both in euros and in Swiss francs.

was likely to be small to nonexistent within a given generation. As governments asserted more control of the money supply over time, it became meaningless to talk of a parallel standard—different nations adopted a bimetallic standard or a monometallic gold or silver standard up to the 1870s, often in the guise of a de jure bimetallic standard. Yet could a parallel standard have worked?

There are two realistic possibilities for how a parallel standard could work. The first alternative is that one metal is adopted as the unit of account and all prices are posted in terms of this money. The other metal will then fluctuate in value against this standard, and prices paid in it will deviate from the posted prices, although this of course expresses changes in value based on the supply and demand of both metals. The second alternative is a slight modification of how the European monetary system worked up until the French Revolution (cf. Einaudi 2006). This system was based on a unit of account, on "imaginary money" such as the French livre or the British pound before 1816 and similar units throughout Europe which did not correspond to any circulating coins. Instead of denominations in terms of such imaginary money, gold and silver are coined in whatever the desired weights and purities are. Prices, including those of gold and silver, are posted in terms of the unit of account. The monetary authority daily announces how many livres a standard gold and a standard silver coin are worth (or simply the prices of a pure gram of gold and silver), adjusting these prices to maintain the market rate of exchange between the two metals. Such a monetary authority could easily be privatized; its decrees would then simply concern a unit of account that businessmen were free to adopt.

It seems quite probable that a parallel standard is very workable on either of the two models, and that it could—and did—therefore provide all the services that money can provide. The widespread use of both metals would stabilize the exchange rate, and the use of debased currency as small change could overcome the problem of divisibility. That the parallel standard didn't survive therefore has little to do with its intrinsic merits and is wholly a case of government intervention and the assertion of government control over money. Bimetallism proper is a clear example of this. When the government established an exchange rate between the two metals different from the market rate, this was a coercive price control, or what Hülsmann

(2004) calls fiat equivalence. Such equivalence, as Professor White (110–13) lucidly explains, brings forth the effects described by Gresham's law. The result is a de facto monometallic standard.

That said, not all cases of bimetallism lead to this result. White (115–16), citing Milton Friedman (1992) and Marc Flandreau (1995), notes the case of 1803–73 France. The French mint successfully operated a bimetallic standard with both metals circulating in France, and it never changed the official mint silver-gold ratio of 15.5:1. There are two key reasons for this success: First, France did not see the use of fiduciary media to any great degree before 1873,[2] and the French people held a large proportion of the world's gold and silver. They therefore constituted a large demand reservoir, ready to absorb inflows of either gold or silver, which were provoked by small variations in the market exchange rate between the metals. Second, the French mint charged the costs of minting to the merchants who brought metal to the mint. The minting costs provided a safety margin, ensuring that the exchange rate could fluctuate within narrow bands without provoking a mass substitution of coinage. Flandreau (1996, 866) has further argued, based on Jean-Baptiste Say, that the bimetallic system was self-stabilizing: market actors were free to pay their debts in the currency of their choice, and they would naturally choose the slightly depreciated, legally overvalued metal. Demand for the legally overvalued metal would therefore increase, and this would naturally increase its value, driving the market rate back toward the mint rate.

Why, then, did the bimetallic system end? Here Professor White (116) is less than informative: "After 1873, France's luck ran out. The number of silver ounces equivalent to one gold ounce at the world price ratio rose so far above 15.5 that the French mint had to stop coining silver." In other words, the bimetallic system ended because it ended. We're left to speculate—perhaps White assumes a change in market conditions as the explanation for the switch to the monometallic gold standard in France and across the world. Silver became so cheap (presumably because it became much more plentiful, but White does not elaborate the point) that the choice was

[2] White (115) writes that France lagged behind other countries in the use of bank-issued money, but that is a biased phrasing that assumes money substitutes are a superior form of money—which is still a key point of contention, as will be argued below.

either suspension of silver coinage and a de facto gold standard or a de facto silver standard, which would be unacceptably inflationary. This argument that the classical gold standard emerged historically as the natural outcome of a market process has also been elaborated by other writers (Gallarotti 1995; Ammous 2018).

However, this narrative does not hold water. It is on the face of it unlikely that the exchange rate between gold and silver, for centuries so stable, should all of a sudden become unstable, one way or the other. Indeed, Flandreau (1996) argues that this was not the case, that the move to gold monometallism was the result of political action, not market evolution. Specifically, he argues, the French mint chose to suspend silver coinage to impede German currency reform. The Germans had been selling silver for years to fund gold purchases and the institution of a gold standard in the newly united Germany, but it was only when the French suspended silver coinage in 1873 that the price of silver fell. Friedman (1990) argues along similar lines that the decision to abandon silver in the U.S. in 1873 caused the fall in the price of silver: had silver coinage continued, the price would have continued to be stable, if somewhat lower. Combining the two studies, a reasonable conclusion is surely that the bimetallic system could have worked—if politicians and mint officials had allowed it to work.

This brings us to a key historical claim by Professor White—that the bimetallic or parallel standard was outcompeted by the rise of modern banking:

> Bimetallism became irrelevant because a payment system relying on physical transfer of coins became obsolete. . . . Modern banking provided a better solution than bimetallism to the problem of keeping currency pieces of small and large values at par. In a monometallic standard with the widespread use of bank-issued money, both small and large payments are typically made in banknotes and checks, all kept at par by redeemability for the standard metal. This became the standard solution as bank-issued money gained popularity with the public. . . . Now a banking system on a monometallic gold standard could provide currency in all desired denominations without shortages of small or large denominations. (113, 117–18)

Now, it's a separate question of historical inquiry to what extent bank money served as small change—on the whole, it didn't; it is

a much more important question, however, whether this simple causal sequence works. Is bank money really superior money? If so, the developments of monetary history could of course be explained as progress—in fact, discussions of bimetallism and mint ratios would then become secondary to questions of bank legislation. However, from the perspective of the basic function of money as a medium of exchange, this essay has argued that a metallic standard was fully capable of dealing with the problems alleged by Professor White, and that the parallel and bimetallic standards were destroyed by government intervention rather than simply outcompeted by a superior system.

Modern banking did play a crucial role in the fall of the purely metallic monetary order, but the causal sequence is different from that proposed by White. Debasement and the imposition of fiat equivalence between debased and full-bodied coins (or between overvalued and undervalued metals) spurred the development of bank money, since banking was a way to avoid or mitigate the consequences of such policies (Hülsmann 2004). When Gresham's law engaged, the money supply contracted in a fiat deflation, as one metal (or full-bodied coins) ceased to circulate. Payment in cash became much more difficult, and banks arose as an efficient way of paying in this situation of artificial scarcity of cash. Professor White (76–81) also highlights the role of banks in dealing with the welter of different coins.

With the 1870s and the rise of the classical gold standard came fiat demonetization of silver and therefore a massive fiat deflation of the money supply. There simply wasn't enough gold available to quickly and smoothly substitute for the missing silver. The result was deflationary pressure throughout the gold-standard countries, which eventually could have resulted in a new monometallic equilibrium, as the rise in the value of gold was a stimulus to further gold production. However, in the short run, gold production was more or less fixed. Hence, the adjustment period invited the use of more money substitutes instead, and the massive expansion of modern banking and the use of fiduciary media was thus stimulated by the deflation brought on by the adoption of the gold standard.

It is clear that the historical record alone cannot settle the question of the causes of the evolution of the monetary system.

While one or the other interpretation may sound more plausible, historical understanding, especially in economic history, ultimately depends on theoretical presuppositions. It is therefore logical to investigate Professor White's views on so-called free banking and its alleged superiority.

FREE BANKING?

The gold standard as Professor White presents and defends it is always a gold plus fractional-reserve banking standard. White argues throughout that this is simply the natural way the monetary system evolved and that any limitation on the issue of fiduciary media is illegitimate and harmful.

Free-banking doctrine should be familiar to the readers of this journal. White in *Better Money* provides a full if brief overview of it, with ample citations to the works laying out the case for free banking in full (156–60, 252–67). White (258) cites Ludwig von Mises to explain how fiduciary media and fractional-reserve banking are possible. In contrast to a claim to bread or any other consumer or producer good, a claim to money can perform all the functions that money can (Mises 1953, 266–67). A mature and secure claim to bread has the same (monetary) value as the quantity of bread to which it is a claim—but in order to actually consume the bread, to fully enjoy the services of the economic good "bread," one must redeem the claim. A mature and secure claim to a quantity of money, on the other hand, is a perfect substitute for money: if such claims are widely accepted, they can function as media of exchange without ever being redeemed. Thus, it is possible for the issuer to issue more such claims than the issuer can redeem at any given time. When people hold money substitutes, it becomes possible for banks to issue uncovered substitutes, provided they do not jeopardize their reputations. Hence, fiduciary media arise and fractional-reserve banking becomes possible.

Going beyond Mises, White also details how a free-banking system is an efficient way to provide the economy with a circulating medium. While White's citations of Mises are always in support of his own position, it must be mentioned that Mises himself was not so positive, as Joseph Salerno (2012) has pointed out. Reading Professor

White, one sometimes gets the impression that his work is the logical conclusion to Mises's monetary theory, an impression that is hardly consistent with Mises's own writings. In the following, three areas of dispute will be examined: the ethics and history of free banking, the incompatibility of free-banking theory with the currency principle, and finally the question of monetary equilibrium.

The Ethics and History of Free Banking

Professor White also makes the legal/moral claim that any limitation on banking contracts—that is, any prohibition on the issue of fiduciary media—is a breach of the freedom of contract (253). Any free monetary system—hence the gold standard—therefore has to allow for fractional-reserve banking practices. There is a large literature debating the ethics of free banking, both pro (Selgin 1993; Selgin and White 1994; White 2003; Evans 2015) and contra (Hülsmann 2003a; Hoppe 2006; Bagus, Howden, and Gabriel 2015). Although the moral claim is not a major part of Professor White's argument, the structure of chapter 3 of *Better Money* and his general remarks on the feasibility of fiduciary media suggest that the feasibility of fiduciary media in itself is an argument for their moral acceptability. However, no one ever argued that fiduciary media are impossible—they are clearly a fact of economic life. The ethical argument against fiduciary media is not that they are impossible, but that they are contrary to fundamental ethical and legal principles and constitute a kind of fraud or failure to uphold property rights and legitimate contracts.

White repeats an objection against Jesús Huerta de Soto's (2012) arguments against the legal acceptability of free banking that has gained some popularity and that therefore deserves a brief comment. Huerta de Soto (2012, 1–36, 119–47) lays out his arguments based on the principles of Roman law, and proposes that fractional-reserve banking rests on an illegitimate confusion of the *mutuum* (loan) and the *depositum irregulare* (deposit) of fungible goods such as money. Against these arguments White (279) cites Andrew Collins and John Walsh (2014), who argue that there was fractional-reserve banking in the Roman Republic and that Roman law allows for fractional-reserve banking. What Collins and Walsh at most show, however, is that in ancient Rome the *mutuum* and

depositum irregulare contracts were not defined the way Huerta de Soto defines them and did not function the way Huerta de Soto says they functioned. But Huerta de Soto's argument is not about legal archaeology; when he refers to Roman law he has in mind a living tradition as it evolved through the Middle Ages and later: "By 'Roman law' we refer to the evolutionary, customary system based on the logical, exegetic, and doctrinal analysis of jurists of the Roman classical school. . . . [T]he continental system [of law], based on Roman law, rests on precedents, sound doctrine, and juridical theory" (Huerta de Soto 2012, 126, 127).

Huerta de Soto clearly has the fundamental principles of the Roman legal tradition in mind, and it is from these principles—and not from legal practice in ancient Rome—that he concludes that fractional reserves are unlawful. It is therefore also on these grounds that Huerta de Soto must be refuted, which neither Professor White nor Collins and Walsh have done.[3] White does not here address the basic position of Huerta de Soto and his school, namely that a contract that promises the full and instantaneous availability of a sum of money to both parties is self-contradictory and therefore invalid (Huerta de Soto 2012, 13–20, 119–47; Bagus, Howden, and Gabriel 2017). There is thus much more substance to the ethical critique of free banking than Professor White lets on.

Similarly, the history of fractional-reserve banking is not quite as straight-forward as Professor White suggests when he writes that "history shows that modern fractional-reserve banking spread from medieval Lombardy throughout Europe and the rest of the world, and thrived, for centuries before deposit insurance" (264; cf. 76–80). The unsuspecting reader will be led from such remarks to believe that fractional-reserve banking flourished and developed freely and harmoniously over time, yet the historical record shows something different. In the Venetian banking system of the late Middle Ages that White cites, the private banks acted in collusion with the government—as they had to, since their practices were strictly illegal (Lane 1937, 200–202). Venetian banks would buy up government debt in return for the privilege of issuing uncovered bank money. This partnership eventually evolved into a state bank, the Banco di Rialto, in 1587 (Luzzatto 1964, 42–45). More generally,

[3] Nor has any other writer, for that matter.

in contrast to White's positive story, the early history of banking may be seen as a litany of more or less fraudulent attempts to introduce fractional reserves, always ending in bankruptcy and crisis (Huerta de Soto 2012, 37–114; Hülsmann 2008, 199–207).

Professor White is on much firmer ground when dealing with episodes of free banking in the last three hundred years or so. A great deal of work has been done to document various free-banking episodes since the publication of White's (1995) own pioneering work in 1984. But the problem is precisely that this history is episodic; it is arguably only with the establishment of central banking from the mid-nineteenth century on that fractional-reserve banking became a constant in economic life in developed countries. Professor White (2023, 146) cites Mises (1953, 298–99) in support of his conclusion that "the progressive development of fractional-reserve banking from the Middle Ages onward had historically spared the world much of the expense that would have been incurred if all the growth in money demand over the centuries had instead been met by gold mining." Mises's argument will be examined in the next subsection when dealing with the resource costs of money, but it is worth noting here that Mises (1953, 298–99) does not refer to this long time frame. While there is no explicit reference to a particular time period in the chapter of *The Theory of Money and Credit* to which White refers, Mises's discussion of Adam Smith and David Ricardo seems to indicate a rather more limited time frame. This is perhaps a minor point, but Professor White throughout his book has a habit of citing Mises in support of his own arguments without acknowledging the possibility of other interpretations of Mises.

The Currency Principle

Throughout his book, Professor White presents fractional-reserve banking as the natural development of a gold standard, claiming that fractional-reserve deposits emerged simply due to market acceptance of them (256). This is most starkly evident in his critique of Milton Friedman's and Murray Rothbard's description of 100 percent–reserve banking as necessary for a "real" or "genuine" gold standard (103, 252ff.). It is true that such qualifiers are loaded, since they clearly imply a value judgment or at least a judgment as to the proper characteristics of the gold standard. However, simply

dismissing their understanding in this way does not do justice to Friedman and Rothbard—they might, after all, have had reasons to come to this judgment.

The gold standard simply means the use of gold as money (Friedman 1961, 67). And a "real," "genuine," or "consistent" gold standard simply implies the consistent application of the currency principle, which states that the monetary standard should behave as if only the precious metal were in circulation—that is, it prohibits the expansion of money substitutes beyond the quantity of gold that flows into the banking system. It is true that the currency school economists rarely held the principle in this strong form (V. C. Smith 1990, 127–28) and even consciously excepted bank deposits (Fetter 1965), but these are simply facts of doctrinal history. Mises (1953, 369) is surely right when he argues that the great weakness of the currency school was their failure to consistently apply their doctrine. The currency principle logically demands extension to all money substitutes, whether notes, deposits, or any other form they may assume. The failure to consistently apply the principle is what led to the persistence of economic cycles after the passage of Peel's Act of 1844, since the banks were left free to expand their fiduciary issue in the form of deposits. Mises's recognition of this point led him to advocate the suppression of the further issue of any and all fiduciary media (1953, 438).

The gold standard plus the currency principle means that the supply of gold alone determines the supply of currency. Professor White's schematic representation of the economics of gold production discussed above indicates how the supply of currency is regulated, but he does not seem to recognize that fractional-reserve banking suspends the currency principle, nor that in his own system the use of both gold and bank money creates a logical contradiction. White argues that banks expand their fiduciary issue in response to an increase in the demand for money—indeed, it is a core proposition of modern free bankers that banks can at all times, almost instantly, achieve monetary equilibrium. However, what then is the role of gold production, and how can gold production be explained at all under a mixed standard of gold and bank money?

Gold production is supposed to rise in response to an increase in the demand for money, but this demand is already satisfied by the issue

of the banks. Hence, despite White's presentation of the increase of the gold stock in these terms, he cannot consistently claim that gold mining is a function of monetary demand for gold, or at least not in the facile way he does in *Better Money*. The expansion of banking should lead, rather, to a fall in the demand for gold. If White's description of how the gold standard works is correct, it is not at all clear how the great expansion of gold production in the second half of the nineteenth century—precisely the period of the great expansion of modern banking—can be explained. As argued above, this must rather be seen as the consequence of the forced demonetization of silver and only secondarily as the consequence of monetary demand for gold, either in the form of coins in circulation or as central bank reserves.

The final argument against the exclusive use of gold and for the superiority of banking is that banking saves resources. Professor White (145–47) cites two versions of this argument: Adam Smith's classic "highway in the sky" and Mises's more sophisticated means of production argument. However, both arguments are fallacious.

Smith argues that the gold and silver employed in circulation are simply so much "dead stock" (i.e., not employed productively). They are like the highways of a country—necessary for the circulation of goods, but making the land under the them useless for productive purposes. Hence, substituting paper money for part of the gold and silver in circulation is like building a "waggon-way through the air" that enables the country to convert "a great part of its highways into good pastures and cornfields, and thereby to increase very considerably the annual produce of its land and labour" (A. Smith 1904, 341). This metaphor holds insofar as a quantity of gold employed as money is a quantity of gold that cannot be employed for consumptive or productive purposes. However, just as alternative uses of the land appropriated for Smith's highway are deemed less valuable than the highway use, nonmonetary uses of gold are deemed less valuable than the monetary use, and economic actors willingly forgo them. Whatever could have been produced by an additional quantity of gold is deemed less valuable by the only people whose judgment really matters in this case: the members of the gold-using society.

Smith's argument can also be understood in a more general way, and it is in this way that White seems to take it. Here "dead stock"

is taken to mean "unproductive capital," and a reduction of the use of gold is taken to lead to an increase in productive capital. "The export of gold and silver coins, made redundant by banking, had enabled Scotland to import machines and materials that promoted its real economic growth," White argues (145–46). Yet all that would happen in this case is that the money supply would increase due to an inflow of fiduciary media and the first receivers would be able to benefit from a temporary increase in their purchasing power. Since Scottish notes are not valued outside Scotland, the temporary increase in imports during the inflation would have to be paid for by an outflow of gold. This outflow would tend to limit the inflation and lead to a reversal of flows, the price-specie mechanism first discussed by David Hume (1987). At most, the final outcome might be a greater amount of capital goods in Scotland than before the issue of fiduciary media.

However, three counterarguments show that this final outcome is not an argument for the use of fiduciary media: First, it is very uncertain that Scotland would in fact be better supplied with capital goods, since the international flows would tend to reverse as described by the price-specie flow mechanism. Insofar as fiduciary media flowed into investment and thus did not cause a rise in consumer goods prices, this mechanism would be weakened. Second, a lot of capital would have been malinvested and ultimately wasted during the bank-fueled boom in Scotland. Third, the total capital of the world, which in this case is the proper unit of analysis, would not have increased. A redistribution of capital in favor of Scottish industrialists and bankers is not obviously a desirable outcome. If Scottish industrialists were somehow more productive than non-Scottish industrialists, or if the redistribution on net were from consumers to investors and businessmen in Scotland, then the outcome might be greater global productivity. This is very uncertain, however, even if it could be asserted that it would be an overall improvement.[4]

Mises's argument is more sophisticated, but it too rests in the end on the same fallacy as that of Adam Smith. Production of gold, so Mises (1953, 299) argues, ties up factors of production that

[4] In fact, this argument is analogous to the doctrine of forced savings and just as untenable. On forced savings, see Hülsmann (2003b).

could have been employed for the production of consumer goods. Therefore, in a time of rising population and expanding industry, when the demand for money naturally rises,[5] the expansion of the use of fiduciary media frees up factors of production for industrial use. However, this expanding demand for money will first become evident as a rise in the purchasing power of money, as prices naturally tend to fall in this situation. It is therefore not necessary for the supply of money to increase at all (Hülsmann 2000; cf. Rothbard 2009, 525–26). If economic actors desire an increase in their nominal holdings (i.e., their holdings of gold coins), then factors of production will be allocated to producing gold, but this simply reflects increased demand for purchasing power. Again, the alternative uses of the factors of production are deemed less valuable than their use in money production by the people that matter: the economic actors in the gold-using society (Hansen and Newman 2022).

Monetary Equilibrium and Free Banking

While fractional-reserve banking is not in accord with the currency principle, free bankers argue that it ensures monetary equilibrium. There is a double claim here: that banking leads to overall equilibrium, and that the banking system itself tends to be in equilibrium. Professor White does not elaborate new arguments in this book but rather draws on the extensive free-banking literature.

Monetary equilibrium simply means that the supply of money is equal to the demand to hold money (Horwitz 2000, 70). In describing the economics of gold production, Professor White (chapter 2) shows how gold production tends to rise in response to a rise in gold demand. Similarly, a banking system will almost automatically expand its fiduciary issue when demand rises: rising demand for money means that the value of money rises, hence it becomes attractive to borrow more money from the banks, who are happy to lend this new money into existence, since a higher interest rate informs them that there is more demand for their loans. This ensures monetary equilibrium, which in turn ensures that the price structure of the economy is not disturbed by changes from the money side (Horwitz 2000, 4, 11).

[5] Because the supply of goods and labor services forms part of the demand (exchange demand) for money. Cf. Salerno (2010).

A core critique of this picture, made again and again, is that banking is not necessary for this kind of equilibrium. That is, the supply of money will always be equal to the demand for money, since the value of money will change to accommodate any change in demand. This change in the value of money consists in the change of various prices of goods and services in the economy. As prices change, the purchasing power of money adjusts to the changing conditions. This change in money's purchasing power has been considered above—it is what leads to increases in gold mining on a gold standard. But as has already been emphasized, it is not necessary for a rise in purchasing power to be neutralized by a rise in the supply of money, as the rise in purchasing power is itself enough to ensure monetary equilibrium.

Furthermore, banking itself is not a stable system, a point already noted by Adam Smith (1904, 341): "The commerce and industry of the country, however, . . . cannot be altogether so secure, when they are thus, as it were, suspended upon the Daedalian wings of paper money, as when they travel about upon the solid ground of gold and silver."

Money has a driving force of its own, and any monetary equilibrium is always ephemeral (Mises 1998, 413–16). Both the demand and the supply of money continually change, and the fiduciary issue of a fractional-reserve banking system will always be fluctuating. Since banks lend money into existence, whether in response to an increase in the demand for money or simply in an attempt to increase their own business, these changes have repercussions across the capital structure. Thus, since any change in the data of the market has an impact on prices, in a free-banking system, any change will necessarily lead to a change in the supply of money and hence the amount of credit granted. In a progressing economy where prices tend to fall, this means that a tendency for credit expansion is built into the system. Rather than causing equilibration, such credit expansion is extremely disruptive, since it directly affects the capital markets through changes in the market rate of interest (Davidson 2012, 215).

Professor White disagrees with this assessment. According to him, free banking avoids monetary disequilibrium and thereby also business cycles (265). This again points to a basic disagreement

over theory. It is not monetary disequilibrium that leads to business cycles, but the issue of fiduciary media, or any creation of new money, that enters credit markets and the market for capital goods before it reaches consumers. Such an inflow of new money changes the capital or time structure of the economy, even though there has been no change in social time preference or the amount of savings. Hence, the new capital structure is unsustainable. A change in the demand for money, on the contrary, simply leads to a change in the value of money—in fact, a change in the demand for money is nothing but a change in the value of money on economic actors' value scales. Hence, there are no systematic effects on the capital or time structure of the economy.

The forces of competition, White argues, will restrain individual banks from overexpanding and hence causing crises (158–59, 265–66). An overissue by an individual bank will cause it to lose reserves to its rivals, and it will quickly be forced to contract its issue again. White brusquely dismisses the possibility of banks working together as a cartel, since cartels work by limiting output. However, it is well known that banking is the one exception to this rule: because banks profit from credit expansion, a banking cartel would aim to loosen the limits to credit expansion inherent in the system. The real argument against the feasibility of such a cartel is that relatively sound banks would not want to collude with riskier banks out of fear of losing their customers' goodwill (Mises 1998, 444).[6]

Be that as it may, Professor White implicitly acknowledges that banks are not really restrained from overexpansion. White, free bankers, and their critics all agree that central banks are not, by the nature of the case, restrained by the banking system. What eventually limits the issue of central bank fiduciary media on the gold standard is the external drain: gold will tend to flow out of the country as the bank inflates the currency. So far, White's argument is sound. However, he does not see that all this is also true of individual banks or the banking system of one country. That is, if the external drain is not enough to prevent central banks from increasing their fiduciary issue, even if it disciplines them in the long run, then why should it be enough to discipline a free-banking system, as

[6] This is one instance where White could have enlisted Mises's authority for his position but did not.

White argues (265)? More generally, the external drain happens every time a bank expands its fiduciary issue, and is not unique to central banks or to a country as a whole. That is, the external drain is simply the drain of reserves from the expanding bank to the nonexpanding banks (Mises 1998, 434–35). Since this is the case, it is not clear why the drain should act as a sufficient limit in the case of an individual bank but not in the case of a central bank or a cartel of banks. Central banks on the gold standard lost reserves when they expanded their fiduciary issue—and they did it anyway, leading to the recurring business cycle throughout the nineteenth century. There is thus no clear mechanism proposed in Professor White's book—or in the free-banking literature generally—showing why banks, individually or by forming a cartel, would not attempt to increase their business through "excessive" credit expansion.

Professor White enlists Mises (1953, 298–99) in support of his argument that banks issuing fiduciary media ensure monetary equilibrium, most prominently when he argues that the issue of bank money expands to meet rises in the demand for money.[7] White (265–66; cf. 1999, 60–64) holds that banks are constrained by the principle of reflux—the return of notes upon repayment—from expanding beyond this limit. However, Mises emphatically rejects this conclusion, writing that banks are not restrained in their business by the demand for money:

> The issuers of the fiduciary media are able to induce an extension of the demand for them by reducing the interest demanded to a rate below the natural rate of interest. . . .
>
> . . . If the banks-of-issue bring the rate of interest they charge in their creditor transactions near to the natural rate of interest then the demands upon them decrease; if they reduce their rate of interest so that it falls lower than the natural rate of interest, then these demands increase. The cause of fluctuations in the demand for credit of the banks-of-issue is to be sought nowhere else than in the credit policy they follow.
>
> By virtue of the power at their disposal of granting bank credit through the issue of fiduciary media the banks are able to increase indefinitely the total quantity of money and money substitutes in circulation. (Mises 1953, 306, 311)

[7] See the discussion of the arguments of Mises and Smith in the previous section.

There is thus no stabilizing mechanism built into fractional-reserve banking; on the contrary, since it is always possible for banks to expand their business by lowering the interest rate at which they grant loans, the banking system is a source of returning disequilibria.

In all fairness, Mises (1953, 312; cf. 1998, 431–44) thinks that competitive banking, where banks don't collude and expand credit on the same principles, would limit the issue of fiduciary media to variations in the demand for money. This returns us to the crucial question: Is a banking cartel possible, or is it likely that banks would unofficially follow similar principles in granting credit? Despite White's dismissal of this possibility, a cartel would remove the limits to credit expansion. Concern for one's reputation cannot be a hard constraint on individual banks: if the banking system as a whole expands, the more conservative banks still don't lose their reputation relative to the other banks. It is also possible for the more conservative banks to join the expanding banks indirectly, by funding the outflow of reserves from these banks in the interbank loan market (Gertchev 2012). Such loans would also remove the limits on the issuance of fiduciary media in a free-banking system.

Professor White describes the business of banking and the decision as to how much credit to extend as a simple case of calculating risks (260–64). The probability of withdrawal of a given amount of money from the bank can be assessed, and hence the banker can also assess how large a reserve it is wise to hold. While White briefly dismisses Huerta de Soto's (1995, 30) critique of this position, he does not engage its substantial arguments. Huerta de Soto (2012, 385–95) bases his argument on the nature of banking as a type of human activity. According to him, withdrawals from banks are not completely random events, but rather result from human decisions. It is therefore correct that bank withdrawals and bank runs have identifiable causes, as White states, but it does not follow from this that the bank manager can successfully calculate the probabilities of such actions. While it may be conceded that there is a normal flow of funds in and out of banks in the normal course of business, there is no reason to assume that "the normal course of business" will continue undisturbed for all time, or only evolve in a predictable manner. This would be tantamount to assuming that human action in this field is thoroughly predictable. In addition, the business of banking itself influences the demand for bank money and is liable

to provoke reserve outflows and bank runs through the course of the business cycle.

BITCOIN

Following White, it is now time for an analysis of bitcoin,[8] which can be mercifully brief, since the above comments on the gold standard apply directly to bitcoin as well. White (444–54) considers the key problem of bitcoin to be its limited supply. According to White, the design of bitcoin is really the implementation of (eventual) zero growth in the supply of money. This means that the value of bitcoin is bound to be more volatile than that of gold, since gold production can compensate for increasing demand for gold and nonmonetary uses of gold can compensate for declining demand for gold. Since the future production rate and final total stock of bitcoin are completely fixed, and since there are no alternative uses of bitcoin, any change in the demand for bitcoin must lead to a change in its price (444ff.).

Bitcoin's Nonproblems

Professor White (389) holds that the design of bitcoin as having a limited stock leads to extreme volatility and that this volatility inhibits the adoption of bitcoin as a common medium of exchange. However, it seems that White here conflates volatility and appreciation. It is true, of course, that the price of bitcoin has been at certain periods extremely volatile, in the sense of the price both increasing and decreasing dramatically in short order. However, over the long term bitcoin shows strong appreciation, and this in itself is not a problem. In fact, it is arguably a good characteristic for a potential money: Which medium of exchange is more attractive, one which tends to gain purchasing power over time or one which tends to lose purchasing power?

Furthermore, bitcoin's volatility would surely decrease if it were adopted as money. Its demand would mainly be for use as money,

[8] As in Professor White's book, the discussion here treats the main version of bitcoin, Bitcoin Core (BTC), unless otherwise stated.

and this would likely make its price more stable currently. It is true that the changes in demand would have to be compensated by changes in bitcoin's purchasing power, but it is unlikely that such changes would be as dramatic as the wild oscillations in bitcoin's price in recent years. On the road to monetization, bitcoin is likely to appreciate substantially, but this is not volatility and is not an impediment to the use of bitcoin as money. In fact, on Menger's (2007, 257–62) classic account of how money emerges, appreciation due to a rise in demand for the commodity is an essential part of the process.

This does not mean that bitcoin does not have problems, only that volatility and appreciation are not really a major concern. Bitcoin has three key problems: transaction costs, secondary layers or middlemen, and its nature as a designed software protocol. Professor White does not get into these issues, but a brief review of them is appropriate here.

Bitcoin's Problems

The way bitcoin has evolved, it is now no longer possible to cheaply send a peer-to-peer payment. Since a highly restrictive limit has been maintained on the size of new blocks added to the blockchain,[9] the space on the new blocks for recording payments has become scarce and, consequently, a "fee market" has developed for payments. The development of such a fee market was a consciously chosen path for bitcoin's development after Satoshi Nakamoto left the project, and significantly departs from the original vision for and operation of the bitcoin network. The sometimes significant fees required to enact a transaction in bitcoin are a significant disadvantage against gold or even fiat money, as there is generally no fee attached to paying in cash, whether fiat or gold. With these moneys, such fees exist for payments that are somehow costly and therefore require intermediation—for instance, international transfers—but with bitcoin even basic peer-to-peer payments have now become costly.

This has led to the growing use of middlemen or "secondary layer" solutions: essentially, bank-like entities that help bitcoin

[9] See the classic white paper (Nakamoto 2009) explaining how bitcoin works, as well as Barta and Murphy (2017).

users spend their bitcoin "off-chain," thereby avoiding the fees until eventual settlement on the blockchain. There is nothing per se wrong with this kind of business, but middlemen have become increasingly necessary for spending bitcoin. The bitcoin economy, to the extent that people actually spend bitcoin, therefore tends to become centralized around such middlemen. In contrast, it was easy to spend gold and silver directly, and it is easy to spend fiat money. The use of middlemen is, in most cases, completely optional. It is mostly only when mandated by governments that one must make payments through a bank (e.g., for payments above some arbitrary limit). This is somewhat ironic, since well-known bitcoin advocates (e.g., Ammous 2018, 31–34) have argued that banking was necessary on the gold standard due to the costs of making transactions. This is not true as a description of the historical evolution of the monetary use of gold and silver,[10] but it turns out to be true of Bitcoin Core.

There are forks of Bitcoin, most prominently Bitcoin Cash (BCH), that do not have these problems. Since the Bitcoin Cash protocol allows for bigger blocks and hence more transactions per block, transaction fees are kept minuscule. While this is arguably a better setup than Bitcoin Core, it points to an essential weakness in all cryptocurrencies: that someone somewhere has control over the protocol and the software. Any updates to either must be approved by the miners, or at least the vast majority, it is true, but there is still an essentially arbitrary element of human control and potential for capture at the social level. Such capture has arguably happened to Bitcoin in its transition from an aspiring general medium of exchange to its current function as a "store of value" or reserve asset dependent on middlemen resembling existing banking institutions.

Professor White is indeed right that, in the case of cryptocurrency, one chooses between different monetary policies, for one must choose the protocol whose governance one prefers. In the case of gold and silver, one simply chooses a commodity, the production of which is entirely determined by the economic laws of the market. This is ultimately why gold (and silver) is superior and bitcoin, as it currently exists, is an inferior alternative.

[10] See the discussion of coinage and bimetallism above and the sources quoted there.

CONCLUSION

Money is a commodity, and its value is determined like that of other commodities (Mill 1909, 488). Professor White would likely not disagree with this famous dictum of John Stuart Mill, but his assessment of gold, bitcoin, and free banking is a struggle against it. Bitcoin may be less suited for monetary purposes than is gold, but not for the reasons Professor White proposes. And gold may be superior to bitcoin (or a bimetallic or parallel standard, at any rate), but not because fractional-reserve banking is an inherent part of the gold standard.

This review essay has attempted a correction of White's position, which involves the whole gamut of free-banking and monetary equilibrium theory. Professor White is an excellent expositor of his school, and his book is well worth reading. However, it is precisely for this reason that a critical review of this length was necessary.

Professor White's conclusion, that people should be free to choose the money they want, is perfectly correct. However, the choice is not, as he supposes, between monetary policies. It is between gold and bitcoin (and all other possible monetary commodities) and will be based on the qualities of these commodities. Hence, the comparison between gold and bitcoin comes down to their respective qualities and how well these qualities answer to the purpose of money. It is ultimately on these grounds—not because of the monetary policy supposedly embodied in the fixed supply of bitcoin versus the less limited production of gold—that the verdict comes down in favor of gold.

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