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MONETARY INSTITUTIONS**
*Review Essay on THE THEORY
OF MONETARY INSTITUTIONS*

Lawrence H. White

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*Review Essay on THE THEORY OF MONETARY INSTITUTIONS**

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1. Introduction

The analysis of monetary policy issues and monetary institutions has proved to be one of the most exciting fields of economic inquiry in the past twenty or thirty years. For most of the post-WW II period, economic thought on money and banking had been locked up in sterile statist prejudices. For decades it seemed as if all there was to be decided was *how* government institutions should act and *which* goals they should pursue. Fortunately, these bad old days are behind us. Many present-day economists approach problems of monetary organisation from a much broader angle and accord particular attention to systems of competing private producers of monetary services.

In his new book *The Theory of Monetary Institutions*, Lawrence H. White gives a comprehensive overview of these new approaches under the general heading of monetary institutions. White explains how institutions like money, banks, and clearing house associations arise on the free market (chap. 1). He

* Lawrence H. White, *The Theory of Monetary Institutions*, Oxford, Blackwell, 1999, 240. pages.

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analyses the workings of free banking based on commodity money (chaps 2 to 4), resolutely explodes the case for government intervention in money and banking (chaps 5 and 6), and gives a pertinent if somewhat lengthy discussion of various models explaining central bank behavior (chaps 7 to 10). Moreover, White displays common sense in his analyses of various reform proposals (in particular, private fiat money production, cash-less payments system, legal restrictions theory of money) that seek to put the production of money into private hands (chaps 11 to 13).

No similar work presently exists in print and all students of problems of money and banking should be grateful that White has engaged in the laudable undertaking of writing this book, which has many virtues. White discusses the resource costs of a gold standard, and examines the alleged public-goods character of money and the question whether the use of money generates external economies. He also explodes the idea that media of account and media of redemption can be practically separated, and that fiat money could emerge on a free market.

Not surprisingly, a book that deals with so many important topics on less than 250 pages leaves many questions unanswered. White keeps the promise given in the title of his work: he focuses on monetary institutions. The reader should therefore not expect a treatise on money and banking. For example, White does not give a satisfying account of the formation of money prices (he is exclusively concerned about movements of the price level and does not explain how these movements result from micro-economic processes) and of the various types of free banks (he exclusively deals with fractional-reserve banks). He does not deal with the relationship between banking and business cycles, and does not even define what he means by "institution" or "monetary institution." In short, the book is wide-ranging but somewhat unsystematic. It is written for advanced students in the field and requires a basic understanding of monetary principles in order to be digested.

2. Benefits of Commodity Money

Many economists seem to be incapable of approaching the subject of metallic commodity monies without emotional bias against gold or silver. A major feature of White's book is that it performs an unprejudiced analysis of the workings of a gold standard.

If anything, White's analysis rather underrates the benefits to be derived from commodity monies. Again and again he points out that the gold standard would tend to stabilise the price level, and he presents this as its main advantage. "The main utilitarian arguments for adhering to a gold standard rest on the proposition

that it more reliably preserves the purchasing power of money [...] than a fiat standard".¹

White's discussion in chapter 2 of commodity money prepares the ground to evaluate this argument in favor of gold. He distinguishes between a "market for gold flows" and a "market for monetary gold stocks" and then concentrates entirely on the question how, and at which price level, variations of demand and supply on these two markets tend to be equilibrated. White shows that increases in monetary demand for gold tends to be offset by corresponding increases in the supply of monetary gold (that is, coins) such that monetary demand shifts are "met entirely by an adjustment in the quantity and not in the purchasing power of gold."² By contrast, changes in the purchasing power of gold (ppg) caused by variations on the *flow* market are permanent. "The ppg does not return to its original starting point. This result illustrates the potential vulnerability of the price level to gold supply shocks under a gold standard, a feature often cited as a drawback by the gold standard's critics."³

This analysis is questionable on several grounds. First, the distinction between the market for gold flows and the market for monetary gold stocks is confusing because White uses in fact *two* criteria to distinguish between the two markets. On the one hand, he stresses that the stock market refers to quantities of gold at a given point of time, whereas the flow market refers to periods of time.⁴ On the other hand, he defines gold flows as the consumptive uses of gold that use it up, or "fix it permanently in non-monetary forms."⁵ Monetary gold stocks, by contrast, consist of "gold in monetary forms (coins or bullion)."⁶ Thus, the second criterion refers to the use made of gold, whereas the first criterion refers to the perspective of the monetary theorist. As a result, we are confronted with four classes of phenomena rather than with two: there can be monetary and non-monetary gold flows, as well as monetary and non-monetary gold stocks. White nowhere explains why he singles out and contrasts only the two classes of monetary gold stocks and non-monetary gold flows.

However, White's argument seems to rely essentially on the distinction between monetary and non-monetary uses of gold, so that the above is a minor point of contention. A more severe objection is that, irrespective of the form in which it exists, gold can always be used for exchange purposes. The difference between a two-ounce gold spoon and a two-ounce gold coin is that the latter has a more convenient form for exchange purposes than the former. As a consequence, the coin might command a premium over the spoon, but that is all. Both are objects made out of the money stuff. Both are therefore money. There is simply no monetary gold that can be meaningfully distinguished from non-

¹ White-1999, p. 40.

² White-1999, p. 33.

³ White-1999, p. 36.

⁴ See White-1999, p. 29.

⁵ *Ibid.*

⁶ White-1999, p. 30.

monetary gold. White might plausibly argue that supply shocks bring about permanent variations of the ppg (yet irrespective of whether the new gold is held for monetary or non-monetary purposes), and that demand shocks will tend to be neutralized in the course of time by increased gold production (yet irrespective of whether gold is demanded for new monetary or non-monetary purposes). But then we end up with a pretty familiar thesis, which reflects the age-old insight that there is only one gold market and that demand and supply on this market determine the purchasing power of gold.

Secondly, and most importantly, White overrates the importance of the question whether commodity moneys like gold tend to have a stable purchasing power. It is true that many economists think that this is the main virtue of the gold standard. Thus, if by "main utilitarian argument for adhering to a gold standard" White means that this argument has today *the greatest number of advocates* he is probably right. However, if its price-stabilising properties were in fact the *most substantial advantage* of gold, the case for gold would not be conclusive. Past gold currencies easily out-performed past fiat currencies in terms of purchasing-power stability. But gold was certainly not perfect in this regard, either. Thus, as long as one cherishes the notion of price-level or aggregate-income stability, one will not be able to make a principled case for commodity monies.

But why is a stable purchasing power so desirable? According to White, this is so because 1) a "more reliable unit of account lowers the risk of long-term nominal contracts," 2) a stable money "reduces the burden of tracking the current, and likely future, money supply (the 'Fed-watching' costs in the current US monetary regime," 3) of the absence of seigniorage, which "eliminates not only the standard welfare cost of inflation [...] but also eliminates wasteful rent-seeking struggles over the spending of the proceeds."⁷

These are surely good arguments in favor of the gold standard, but none of them strictly speaking makes the case for a *stable* purchasing power of money. Successful long-term investment depends on a predictable rather than on a stable purchasing power of money. And, similarly, points 2 and 3 relate to the fact that money production under a fiat regime depends on human will rather than on will-independent data. In short, even if the gold standard did not produce a stable price level it would still, on these grounds, be preferable to fiat monies.

It is regrettable that White does not discuss the merits of the various stabilisation benchmarks to which he refers. He seems to take them for granted on grounds such as that "a number of monetary economists have argued that nominal income stabilisation has desirable macro-economic properties."⁸ This way of arguing certainly has the advantage that White can meet fiat-money zealots on their own grounds when he rebuts their arguments. However, his decision to cast his analyses in terms of purchasing-power considerations also has the serious disadvantage of rendering many of his efforts inconclusive. For example, he

⁷ White-1999, pp. 40f.

⁸ White-1999, p. 67.

summarizes his evaluation of fractional-reserve banking as follows: "Because M moves to offset changes in V in the closed-economy case, the system acts automatically to stabilize MV , nominal aggregate demand for goods, or P_y , nominal income [...]."⁹ Assume for the sake of argument that this statement is true. It still does not follow that fractional-reserve banking is a good thing, unless one first makes the case for nominal-income stabilisation in general.

The most substantial utilitarian argument for gold seems to have a much more solid foundation than the stabilisation idea could offer. What the advocates of the gold standard commonly have in mind is that the *market* is best at selecting the best monies and that, whenever the market has been free to choose, it has chosen metallic monies. The advocates of the gold standard are convinced that the same result will be obtained in the future, if only the markets are truly unhampered. Thus, the expression "gold" is to them shorthand for any market-chosen money. Competition between the various monies, like competition between all other institutions, will reveal which of them is best suited for which kind of transactions.

It does not matter, then, how ample the money supply is, and it does not matter which price levels are established under a gold standard. The decisive argument in its favor is that it is a purely voluntary institution: it is a creature of the unhampered market, chosen because its users believe it to be the best money available.

What if the market participants err? What will happen in case of a future gold or silver inflation similar to 20th century global fiat money inflation? If huge gold discoveries will be made in the future, so that gold becomes as common as iron, well, then gold will become useless as a medium of exchange. It will be driven out of the money market and replaced by other commodities that better suit the purposes of their owners. But in any case, the sovereign decisions of the market participants are supreme. Whatever commodity money happens to be selected by the market is, then, the best money conceivable under the then prevailing circumstances.

3. Resource Cost of the Gold Standard

White defends the gold standard against Milton Friedman's well-known claim that the annual costs of the gold standard would amount to 2.5% of national income.¹⁰ For example, White points out that "switching to a fiat money regime does not *automatically* escape these resource costs. [Banks and central banks] must sell off their gold stocks to release gold for alternative uses. For whatever reason, the world has not in fact seen a meltdown of more than a small fraction of

⁹ *Ibid.*

¹⁰ He does not mention Friedman's more recent analysis which amounts to an outright repudiation of his former views. See Friedman-1986.

central banks' gold stocks since the end of the classical gold standard or even since the end of Bretton Woods."¹¹ One might add that *even if* the world's central banks sold all their gold this would not imply that the costs of using gold would be diminished. For then *somebody else* would own the gold and have to pay for the resources needed to store and protect it.

Moreover, White argues that Friedman has vastly exaggerated the real resource costs since he reckoned with a 100% reserve ratio on bank notes and other titles for money. The installment of a fractional-reserve banking system would according to White dramatically reduce "the estimated resource cost of a gold standard down to 0.05 percent, or five hundredths of 1 percent, of national income."¹²

This is an interesting and original rebuttal of Friedman. However, White has actually given Friedman's argument more credit than it deserves. For even under a 100% reserve ratio the costs of a gold standard are much smaller than both Friedman and White assume.

The shortcoming of White's calculus is that it relies on the assumption of a 1% per annum diminution of the velocity of money *and* a 0% inflation rate *and* on an "empirically derived" figure of 3% per annum growth of real income. Now, even if we skip the question what precisely is meant by aggregates like price level and real income, we must observe that White's argument contains a classical *petitio principii*. Given his assumptions, there *must* be a 4% per annum growth of the gold supply, which translates into expenses on gold acquisitions in the order of 2.5% of national income. However, the question is not only what the logical implications of more or less arbitrarily assumed conditions are. The question is also which conditions are likely to obtain in reality. If White postulates 0% inflation then he excludes from the outset the very result that is most likely to obtain under a gold standard, namely, the secular decline of money prices.

Why does White adopt this assumption? Why does he not even consider the possibility, of continually declining prices paid in gold, the natural result of economic growth under a by and large constant gold supply? White argues that such a setting is unrealistic because falling gold prices are tantamount to an increased purchasing power of gold (ppg), and this in turn incites the production of new gold until its old ppg is restored. "A constant stock of monetary gold cannot be an equilibrium in growing economy, in a world with non-exhausted mines, because, with growing money demand, the ppg would continually rise, making mining increasingly profitable."¹³

However, this argument is liable to the following objection: in a growing economy, the production of gold will always stop short before the original price level is reached because of the law of decreasing returns. At any given state of

¹¹ White-1999, p. 43.

¹² White-1999, p. 47.

¹³ White-1999, p. 44.

mining technology, and any given knowledge about gold mines, further production requires ever-greater costs per ounce of gold produced. Therefore, gold production in a growing economy will be stimulated, but it will always stop short before the original price level is reached. This is why there tends to be a secular decline of money prices in growing gold-standard economies.

We can apprehend the operation of the law of returns also from a slightly different angle. Economic growth implies that the non-specific factors of production become increasingly scarce. This means that not only money, but also labor becomes ever more expensive. The costs of gold mining therefore increase under the impact of the very factor that stimulates the demand for money. Economic growth thus always brings about a falling price level. It follows that the Friedman-White estimate of the costs of gold production under a 100% reserve ratio is exaggerated.

Yet the main defect in Friedman's reasoning is much more fundamental. It concerns the very benchmark of his evaluation of the gold standard. Why are costs relevant to tell whether it is worthwhile to have a gold standard? To consider the costs of gold in isolation - that is, without taking into account the benefits of gold - seems to be very unreasonable. Nobody buys the cheapest product just because it costs least. If it were otherwise all men would drive the cheapest type of Korean cars and not a single Mercedes would be sold at the price it is commonly sold.

Although White recognises this problem, the cost-benefit analysis of the gold standard that he offers as a solution is not satisfactory. Based on "two commonly cited estimates of the cost of a 10 percent inflation rate," which "put it respectively at 0.4 or 0.45 percent of national income," and on the assumption that the inflation rate differential between fiat and commodity money is approximately 7 percent, he concludes that a "gold standard's resource cost is worth bearing if the alternative is a fiat standard with 6.5 percent inflation."¹⁴

This chain of reasoning might be suited to meet today's macro-economists on their own grounds, but it nevertheless contains thinly-veiled value-judgements that have no place in scientific policy analysis. In ten lines of his book, White throws 130 years of subjective value theory over board. There are no costs for the economy as a whole. There are only costs for individuals. The decisive question is therefore, *for whom* the gold standard implies which subjective costs and *for whom* a fiat standard brings about which subjective costs. Undoubtedly, there are some persons whose costs will be reduced under a fiat standard, whereas other persons will have to bear lower costs under a gold standard. Yet the costs of these different individuals cannot be compared in terms of a common denominator - unless White tells his colleagues in a future book how to perform such comparisons.

¹⁴ White-1999, pp. 48f.

There is an unambiguous test to find out whether the gold standard - or, for that matter, any other commodity money - is worth its cost: let the market decide. If there are citizens who choose to use gold as money then apparently at least in their eyes gold is worth its cost. And just as we would not object to the consumption of luxury food (everything that is not plain wheat and water) on grounds that it costs too much, there is no reason to object to the use of a commodity money that, in the eyes of its users, is better than any other money.

4. Fiat Money and the Market

We have seen that White's account of commodity monies, while surely more pertinent than the account given in most present-day monetary literature, does not yet do full justice to the gold standard and other free-market monies. Similarly, White's discussion of fiat money, although noteworthy in that it contains insights lacking from most contemporary textbooks, does not go far enough.

White points out that there is no "spontaneous or market-driven path" from a commodity-money system "to the non-commodity, or fiat, standards that prevail today."¹⁵ He makes the important observation:

*"In historical practice, a nation's switch to fiat money was typically made by the central government first granting a legal monopoly of note-issue to a single institution, a central bank, whose liabilities became as widely accepted as specie, and displaced specie as the reserves for other banks. The government then suspended, permanently, the redemption of the central bank's liabilities. With their permanent suspension, central bank notes and deposits became a fiat base money."*¹⁶

Students of monetary economics surely have to absorb this important lesson from the history of monetary institutions. White also explains that "switching costs" make it unlikely that a fiat money could be introduced on the free market. He claims that "nobody would want to go first in switching to a completely novel monetary standard, even if he were persuaded that, in theory, it would work better supposing that *everyone* switched."¹⁷

Although this is a good argument, it does not seem to be the strongest case that can be made against a spontaneous emergence of fiat money on the free market. For White's argument refers to deficiencies of the *will*, and these might well be overcome by marketing and other forms of ideological preparation of the market participants. It is therefore not surprising that White emphasises that

¹⁵ White-1999, p. 18.

¹⁶ White-1999, p. 19.

¹⁷ *Ibid.*

historically (that is, not by logical necessity) the introduction of fiat money "meant breaching pre-existing redemption contracts."¹⁸

However, a more devastating objection against the spontaneous emergence of fiat money can refer to Mises' famous regression theorem, which states that the formation of money prices presupposes the existence of Past market prices of the new money.¹⁹ For example, gold can emerge spontaneously as money because there are gold prices even before gold is used as a medium of exchange. Therefore, the market participants have an objective basis for their speculations about the future purchasing power of gold. In distinct contrast, no such objective basis exists for, say, a new Hülsmann fiat currency that I venture to introduce on the market. A 3-Hülsmann paper scrap that I offer to my hairdresser in exchange for his services has never before been exchanged on the market and consequently neither he or anybody else can have the slightest idea of what to obtain for it in the future.

Furthermore, even if fiat money is introduced through government intervention, it could never survive on the free market but requires constant protection by further interventionism. Indeed, commodity money enjoys a crucial competitive advantage over fiat money, which stems from the very difference between commodity money and fiat money, namely, that commodity money is also used outside of indirect exchange. Commodity money always commands a price on the market, irrespective of how wide spread it is used as money. This in turn is a kind of insurance for the owners of commodity money. Although they know that the purchasing power of their money is subject to variations due, among other things, to shifts in the demand for money, they can be assured that it will never fall to zero because it will always attract a non-monetary demand. This has an important consequence. Even if commodity money falls temporarily out of use as money, it can always spontaneously re-emerge as a medium of exchange, since the market participants can rely on its present (non-monetary) market prices to speculate about its future purchasing power.

By contrast, fiat money has by definition no other than monetary uses. If the demand for it fades away, so that it disappears even momentarily from circulation, it can never be reintroduced again on the market because there are no more market prices that could serve as a basis for speculations about its future purchasing power. From this it follows that fiat money, once it is driven out of circulation, disappears forever. Clearly, this represents a fatal competitive disadvantage of fiat money. Its users are confronted with a risk that could jeopardize not only their actual fiat money holdings but also all of their investments denominated in this currency. Thus, there is a strong incentive for all market participants to switch to any kind of commodity money rather than stay exposed to the risks of fiat money. This switching can take place within a second, if all market participants discover the fatal disadvantages of fiat money at once. In this case everybody will be eager to sell his supply of fiat money even at very low

¹⁸ *Ibid.*

¹⁹ Mises-1980, pp. 129ff; Mises-1998, pp. 405ff.

prices, but nobody will be ready to buy any further quantities of it. The switching can also take place in a slower process, depending on how quickly the realistic evaluation of fiat money spreads throughout the economy.

The only way to prevent this is to create an artificial demand for fiat money by government intervention. This can be achieved, for example, by requiring taxes to be paid in fiat money, or by forcing market participants to accept payments in fiat money (legal tender laws).

Thus we see that fiat money and the free market are in important respects utterly incompatible. This underscores White's criticism, in chapter 12, of the fiat-money models of Benjamin Klein and F.A. Hayek. White attacks these approaches on grounds of the possible time-inconsistency of fiat-money producers, leaving the question open whether fiat-money production could be viable in the free market, and whether it could possibly emerge in a free-market environment.

5. A Blind Spot

It is an astounding fact that a book that covers virtually all the recent debates on monetary issues that are of some theoretical and practical interest does not even mention the current debate on the relative merits fractional-reserve vs. 100% banking. White exempts fractional-reserve banking from the same scrutiny that he applies to all other monetary institutions. While the competitive supply of fiat money and cash-less payments systems are presented as *options* for political decision-making, fractional-reserve banking seems to be a fact of providence.

White even avoids using the very term "fractional reserve," which only appears on page 22. And the only hint to the important debate on fractional-reserve vs. 100% banking that has filled many pages of the *Review of Austrian Economics*, of the *Journal des Economistes et des Etudes Humaines*, of the *Freeman*, and of the *Quarterly Journal of Austrian Economics* appears in a footnote on page 46. But even here White refers only to his own work (with George Selgin) defending fractional reserves.

When White in chapter 3 discusses "money issue by unrestricted banks" what he means is the issue of titles for money (bank notes, demand deposit entries, smart cards, etc.) by fractional-reserve banks. White does not care to point this out. He does not care to mention the substantial difference between A) a piece of property like ten ounces of gold and B) a title for property like a banknote over ten ounces of gold. And he does not stress the substantial difference between 1) titles that are backed by actual property and 2) titles that are not.²⁰ This neglect is

²⁰ By contrast, White confronts his readers with a confusing array of expressions for various monetary aggregates. For example, he speaks of bank-issued money (p. 11), inside money, outside money (pp. 11

nothing objectionable in itself since it only shows that White considers these distinctions to be useless for his argument. But for those who do not consider fractional-reserve banking as a fact of providence these are important distinctions, as we will now proceed to show in more detail.

6. Fractional-Reserve Banking as a Political Discovery Process

White's major goal in his chapter 3 is to counter concerns about the inherent instability of a system that operates with titles for property that does not exist. He does not deny that there could be over-issues of money titles by individual banks. But he stresses that such over-issues are self-correcting. Excess titles that the public does not desire sooner or later are presented for redemption at the issuing bank. "As a consequence, of reserve losses, bank *i* finds its reserves lower than it desires [...]. The marginal benefit of holding reserves now exceeds the marginal net revenue from making loans or holding securities, prompting the bank to sell securities (or not to roll over maturing loans) in order to increase its reserves. Reserves return to bank *i* from the rest of the banking system."²¹

This is, to be sure, a clean story about the workings of fractional-reserve banking. But it is hardly a convincing argument. The crucial question is not whether after the redemption the reserves of bank *i* are "lower than it desires," but whether they are *sufficient* to satisfy demands for redemption. The very problem of a fractional-reserve bank is that these demands might be so high that they cannot be satisfied out of its reserves. In White's account, this possibility seems to be excluded from the outset. Again, his argument is a *petitio principii*.

White then turns to explain how over-issues of monetary titles by the fractional-reserve banking system as a whole would be corrected. After an excellent discussion of two forms of external drain (bank reserve losses to other market participants), he states that because "plurality in currency issue reduces any one issuer's share of the circulation, it limits the danger of a large-scale overissue."²² This observation, which contains a powerful argument against central banking, appears to be unobjectionable. But then White goes on: "Provided that banks act independently, (do not expand in concert), random money-supply errors will tend to offset one another in the aggregate."²³

f), basic money, full-bodied money (p. 26), high-powered money, most basic money, outside or definitive money (p. 74). Although the significance of these expressions is mostly clear from the context in which they appear, it is not clear why White uses a manifold expressions that in most cases mean the same thing. However, occasionally White is almost incomprehensible, for example, when he talks about "loaning certificates into existence" (p. 77).

²¹ White-1999, p. 61.

²² White-1999, p. 62.

²³ *Ibid.*

If this statement were true, it would make a strong case for the stability of fractional-reserve systems. Yet White nowhere explains *why* there can be no uncoordinated overissues of monetary titles. His claim hangs in the air and the case for the stability of fractional-reserve systems is therefore built on an unexamined hypothesis.

And White's hypothesis is indeed wrong. For, as his discussion of over-issues by individual banks shows, he does not assume that individual over-issues necessarily lead to bankruptcy. They just lead to what White claims is a below-optimum level of bank reserves. Now, if it is possible to bring *some* extra money title into circulation then this represents an opportunity for other banks to expand their issues. A bank that receives from one of its customers a money title from another bank can, rather than present the title to its issuer for redemption, issue more of its own money titles and "back" them with nothing but the title of the other bank. This in turn permits other banks - for example, the issuer of the original "excessive" title - to do the same thing. By this sort of zigzag process, all the banks can increase their title issues at virtually zero cost. To be sure, it is not possible for an individual bank to issue huge quantities of uncovered money titles at once and all on its own. But over time and in concert with other banks it can do this through a zigzag process of the sort we just described.

Why does White overlook this process? Because he does not see that, under fractional reserves, the cost of currency issue ("the marginal benefit of holding reserves") for any given bank is not independent of the decisions of the other banks. The more titles a bank chooses to hold, the more titles it can issue, and this permits other banks to do the same thing. Insofar as bankers do this, they reduce the title-issue costs of their fellow bankers to virtually zero. And *all* bankers have a strong incentive to do this since they all gain from the fractional-reserve business at the expense of the other market participants.

Hence, the crucial fact about fractional-reserve banking is that its costs of Production are not will-independent, as they are in all other types of business. They are indeterminate and therefore they cannot effectively constrain the issues of uncovered titles. But why is this so? Because *in a fractional-reserves regime the boundaries of private property are indeterminate*. It is a fundamental notion of the theory of value, even if this principle is often neglected, that (subjective) value and (subjective) cost can only be determined once the property of the acting subject is given. The costs of any venture can thus only be determined in consideration of the acting person's property. The more a person owns the lower is to him the cost of any given venture. Now, what a fractional-reserve banker "owns" - that is, what he actually uses in his business - depends essentially on the choices of his fellow bankers, and their "property" depends in turn on his choices. Therefore, they can all increase their issues (their property) in concert if only-they discover the right zigzag path that leads to common expansion.

In the "discovery process" of the zigzag expansion path, each bank discovers how many uncovered titles it can issue at any point of time. And these issues

change the conditions for the other banks, which can now discover that they can go a little further with their own issues, and so forth. This discovery process is apolitical discovery process because the banks discover how many uncovered (that is, fraudulent) titles they can issue at any point of time. In short, they discover how far they can go in their violations of property rights.

The political discovery process in fractional-reserve banking can be interpreted as a perversion of Say's Law. According to Say, each good offered on the market is a demand for other goods, so that the successful production of a good makes other productions successful. A growing economy thus follows a zigzag expansion path on which each additional production creates a market for already existing products and also for the new products created at later points of time. Very similarly, each issue of a title not backed by money represents an additional opportunity for other banks to expand their own uncovered issues. Each successful issue of an uncovered title therefore makes the issue of other uncovered titles successful.

Mises hinted at this step-by-step political discovery process in the following words:

*"[...] the circulation of fiduciary media can indeed be increased slowly, but it cannot be increased in a sweeping fashion. Each individual bank can only make a small step forward and must then wait until the others have followed its example."*²⁴

He clearly saw that there are no natural limits to the issue of uncovered money titles and therefore he recommended that fractional-reserve banking be outlawed or at least severely restricted by the law. States Mises:

*"The circulation of fiduciary media is in fact not elastic in the sense that it automatically accommodates the demand for money to the stock of money without influencing the objective exchange value [that is, the purchasing 'power'] of money, as is erroneously asserted. It is only elastic in the sense that it allows of any sort of extension, just as it allows of any sort of restriction. The quantity of fiduciary media in circulation has no natural limits. If for any reason it is desired that it should be limited, then it must be limited by some sort of deliberate human intervention - that is by banking policy."*²⁵

White tries to refute this argument by countering what is arguably the best case of his opponents. Even if there were a coordinated rather than a spontaneous expansion of uncovered money titles, he says, this expansion is strictly limited because of "stochastic reserve losses." In fact, with increasing issues of money titles

²⁴ Mises-1980, p. 411.

²⁵ *Ibid.*, p. 346.

"the risk of reserve depletion increases because the increase in gross clearings widens the reserve-loss probability distribution [...] Each bank will feel its risk of running out of reserves too great. Because the closed system has a limited quantity of reserves available, relief from the excess demand for reserves requires the banks to contract their liabilities [...] in order to re-establish their desired levels of illiquidity risk. Given the marginal cost functions the individual banks face for expanding mean demand to hold their liabilities, the volume of -system reserves, the stochastic process generating adverse clearings, and the level of safety each bank desires against reserve depletion, there exists a unique equilibrium volume of system liabilities."²⁶

This argument is liable to an objection analogous to the one we have formulated above, namely, that the determination of probabilities and risk can be a faithful reflection of reality only if there are clear boundaries of private property. Under fractional-reserve banking people act as if more property exists than really exists. As a consequence, they systematically underestimate the real risks linked to their ventures.

Moreover, even if we grant that in a fractional-reserve system there is a unique equilibrium volume of liabilities it does not follow that this equilibrium could be determined stochastically. We here have to stress the distinction between (random) uncertainty and (stochastic) risk, even though this distinction

seems to have fallen into oblivion. The fact is that there *is* something like uncertainty or genuine novelty, and this fact causes White's delicate edifice to crumble. No banker can cognitively determine how far he can go with his issues of uncovered money titles. There might be an optimum or equilibrium amount of titles, but in any case the banker has no means of knowing it. He willy-nilly must base his operations on speculations, and these speculations can be dead wrong.

Moreover, since the issue of further uncovered money titles brings a competitive advantage *vis-à-vis* other banks, each banker is pressured into exploring the limits of possible expansion. From this it follows that, contra White, fractional-reserve banking systems are inherently expansive and unstable.

²⁶ White-1999, p. 63, emphasis added.

7. Is Fractional-Reserve Banking "Responsive" to Changes of Demand?

White²⁷ has one other argument in his defence, which is related to the theory of the responsiveness of fractional-reserve banking. This theory stresses that fractional-reserve banking "responds" to shifts in demand, that is, the system tends to offset an increased demand for money titles by an increased production of money titles, and a reduced demand for money titles by a reduced production of money titles.

However, there is no *need* for fractional-reserve banks to perform such an offsetting because shifts in the demand for money are swiftly accommodated by corresponding *changes of money itself*, that is, by increases or decreases of money's purchasing power. That somebody has an increased demand for money means a) that he is willing to pay a higher price to obtain money and/or b) that he requires a higher price for the money he sells. In both cases, the increased demand *ipso facto* increases the purchasing power of money, thus equilibrating demand and supply of money. And the same thing holds true, of course, for the inverse case of a lower demand for money.

One might argue that, even though it is not *necessary* to offset shifts in money demand by corresponding issues of money titles, it is *possible* to do so. Fractional-reserve banking would then be a (possibly superior) alternative technique for equilibrating demand and supply of money. Yet the crucial premise of this argument is that fractional-reserve issues satisfy a demand that can be defined independently of these very issues themselves, and this premise is fallacious.

To capture the true impact of fractional-reserve banking on the demand for money let us recall that, in distinct contrast to all other goods, the demand for money is *not* independent of the supply of money since the supply determines the purchasing power of money. From this it follows that the titles issued by fractional-reserve banks never just offset a previous increase of the demand for money. Rather, they are themselves the cause of an increase of the demand for money. (More precisely, they cause *further* increases, thus adding to preceding increases of the demand for money.) The fundamental fact is that every new issue of an uncovered money title dilutes the purchasing power of money. The money prices on the market are necessarily higher than they would have been without the issue of the additional title. And since the market participants desire to own certain quantities of purchasing power, rather than nominal quantities of money, the demand for money increases. Thus we see again the perverted operation of Say's Law: The new uncovered title increases money prices and this further stimulates the demand for money (or money titles).

²⁷ White-1999, pp. 64-67.

In conclusion, White's error springs from his view that the demand for money can be defined independently of the supply of money itself. Since this is not the case, however, fractional-reserve issues do not "respond" to previous shifts in money demand but rather create their own demand.

8. The Anchor Theory

White has one last way out. He seems to claim that money prices only depend on the quantity of money (money in the narrower sense). They do not depend, on the quantity of money in the larger sense, which comprises the quantity of money plus all quantities of uncovered money titles.

This doctrine is nowhere explicitly stated in his book, but consider the following quotes: "In a commodity-money system [...] the market for the commodity that serves as outside money determines the purchasing power of the monetary unit."²⁸ Similarly, he claims that, if the gold currency is entirely replaced by titles for gold, "the ppg would still be positive due to non-monetary demand"²⁹, from which we have to infer that without this non-monetary demand the ppg would be zero.

Since this is so, White can argue, an increased issue of money titles has no impact on the price level and, as a consequence, it cannot in itself engender a higher demand for money or money titles. It is impossible for fractional-reserve banks to issue more money titles than its customers want to own.

The argument seems to rely at least in part on the conviction that bank customers desire to own money *titles* rather than money. But the owners of money titles clearly do not desire these titles for their own sake. They desire them only because the titles prove that their holder is the owner of money itself, just as the owner of any warehouse receipt values the receipt only because of the deposited object to which it refers.

Therefore, it is obvious that money titles *do* have an impact on market prices. He who buys a television-set with a one-ounce-of-gold banknote believes that he has exchanged one ounce of gold against a television-set. This is so independently of the question whether the banknote *is* in fact fully backed by gold. Thus, the more uncovered gold titles are issued the higher the prices in gold paid for the various commodities offered on the market will be. Yet this means nothing else but that the purchasing power of gold itself will decrease under the influence of further issues of uncovered gold titles.

²⁸ White-1999, p. 80.

²⁹ White-1999, p. 55.

Even under a fractional-reserve gold standard, the purchasing power of gold does not decrease merely because gold coins disappear from circulation. This is clear from the fact that, if gold coins are replaced by 100% backed titles for gold coins, this has no effect whatever on the purchasing power of gold. It is only because gold titles are issued in excess of the existing gold that the purchasing power of gold is reduced below the level it would have reached without this inflation.

9. Central Banks

White clearly sees that the inherently expansive fractional-reserve system contains incentives for the creation of central banks, which serve to regulate the issues of money titles by commercial banks and to concentrate money reserves in one single pool. However, he urges his readers to "keep the broader concept of central banking distinct from the narrower concept of the functions undertaken by a government-sponsored monetary authority."³⁰ In other words, in White's eyes a central bank can be a purely private institution that typically evolves out of a clearing-house association (CHA). White takes great care to examine the functions that a private central bank is likely to fulfil. He concludes: "A private CHA bank can (and some historical examples of such institutions did) play three central banking roles: acting as a bankers' bank, acting as a lender of last resort when one is necessary, and regulating commercial banks in ways useful for enhancing safety and soundness."³¹

However, the picture that White draws of the operation of private central banks seems to be much too static. In part this is due to his somewhat restricted general perspective on banking, which excludes 100 percent reserve banks.

Otherwise he would have to point out that under a 100 percent system there would be no rationale for a central bank. There would be clearing houses, to be sure, but no private or public lender of last resort, bankers' bank, or regulator of commercial banks. It is only the dynamics of the inherently expansionary fractional-reserve system that creates the perceived need for a central bank.

However, a central bank is only a short-run solution to the problems of a fractional-reserve system. In the longer run, it increases these very problems. The large reserve pool of the central bank represents a kind of insurance for the commercial banks. It is sufficient to satisfy redemption demands that otherwise would have jeopardized them. But it also creates moral hazard, since the banks now know that they can expand their money-title issues much further without facing short-run bankruptcy. This further expansion, then, sooner or later reproduces the problem of insufficient reserves on a larger scale, namely, on the scale of the central bank.

³⁰ White-1999, p. 70.

³¹ White-1999, p. 80.

White thinks that this problem can be solved if the central bank, in times of unforeseen redemption demands, offers "loans at an interest rate below the market rate prevailing in a panic, thus providing the burden-sharing of insurance, but above the normal market rate, thus reducing the potential moral hazard of a bank responding to the insurance by taking insufficient care to keep adequate reserves."³²

Yet White's distinction between a) the market rate prevailing in a panic, b) the normal market rate, and c) the market price that he recommends the central bank should charge, is unwarranted. The very question is what the market price is. And this question can only be answered by letting the market operate. The market rate "prevailing in a panic" *is* the market rate under the circumstances prevailing in such situations. It is true that it is a high rate. But this is precisely the best prevention of moral-hazard problems. If the role of a central bank, as White has it, is to guarantee lower interest rates in redemption crises, then there is a built-in moral hazard in this construction.

10. The Optimal Quantity of Money and Monetary Institutions

Every single point that has been raised in the preceding pages very quickly led us from a discussion of monetary institutions to a discussion of economic principles. And, ultimately, most of the criticisms that we leveled against White's book seem to derive from disagreement over one fundamental question that we might now address in conclusion.

White's evaluation of monetary institutions is based on the tacit premise that the existence of monetary equilibrium requires that the supply of money be adjusted to the demand of money. More precisely, White assumes that demand and supply of money can be defined independently from one another and that they have to be equilibrated by variations of the money supplied, just as the supply of pancakes must, in equilibrium, be adjusted to the demand for pancakes.

Given this assumption, the question arises which institutions are best suited to ensure that the supply of money tends to match the demand of money. This fundamental question is the starting point for White's book. He claims that, on the free market, increases in the demand for commodity money are met with increased production of the money commodity (chap. 2). Moreover, an increased demand of bank notes, bank deposits and other money titles is met with an increased production of these titles by fractional-reserve banks (chap. 3). Thus the free market makes sure that there is at least a tendency for monetary equilibrium to be reached.

³² White-1999, p. 76.

It is probably accurate to say that the majority of present-day monetary economists accept the "adjustment theory" underlying White's argument. And yet, this theory is utterly wrong, as has been demonstrated a hundred times by classical and Austrian economists. And the rejection of this theory leads to a radically different perspective on commodity money, fiat money, and fractional-reserve banking. All concerns about the resource costs of a gold standard and about the utility of fractional reserve banking then fade away.

The starting point of all sound reasoning on money and banking is the insight that the quantity of money is irrelevant, in the sense that the services that money renders to the economy can be neither improved nor diminished by modifying its quantity. Any quantity of money is sufficient to exchange any quantity of other goods. A bigger quantity of money performs the exchanges on the market merely at higher money prices than a smaller quantity of money. Otherwise (if we abstract from redistribution and business cycle effects that spring from its variations) the quantity of money has no importance. Monetary equilibrium is possible irrespective of the supply of money and every supply of money is therefore "optimal." Changes in the quantity of money merely modify the conditions under which equilibrium can be reached. They do not themselves increase the likelihood that equilibrium is in fact realised.

This view is based on the recognition of an essential difference between the services of money and the services of all other goods. The services rendered, for example, by a car do not depend on demand and supply. A car does not run faster and it does not withstand collisions better if the conditions of supply and demand on the car market change. It serves its owner independently of how many cars of this type exist and independently of which price its owner might obtain for it on the market. In the same way, a violin concerto renders services that are entirely independent of the conditions on the music market.

By distinct contrast, the services rendered by money *depend* on the demand of money, and they *also depend* on the supply of money. A higher demand for money brings about lower money prices and that means that the purchasing power of money — that is, the very quality for which it is desired in the first place — increases under the impact of the higher demand. Similarly, a reduced supply of money brings about lower money prices and thus increases the purchasing power of money.

Thus, 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.³³

³³ It is therefore quite difficult to describe monetary exchanges in terms of supply and demand. One cannot strictly speaking say that increased demand brings about a higher price of money because this wording would imply that the object traded (that is, money) remains the same through time. What happens in fact is that money — although constant in its appearance — changes its qualities under the

In the light of these considerations, it becomes evident that fiat money and fractional-reserve banking cannot possibly be useful for the economy as a whole. What appears as an advantage from the point of view of the untenable adjustment theory of money, namely, that fractional-reserve banks can increase the quantity of money titles, must now appear as nothing but the possibility to enrich some market participants at the expense of all others.

11. Conclusion

The Theory of Monetary Institutions will prove to be a valuable textbook for every student of modern problems in money and banking. In this essay, we have focused largely on those few but important areas where White's exposition seems to be deficient and we have tried to point out that our disagreements concern questions of economic principle. This might serve as a further illustration, if need be of such, of the immense practical import of pure theory and of how the latter is related to the study of institutions.

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