THERE'S NO SUCH THING AS FIAT MONEY

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Abstract

I make the claim that fiat money does not exist—that it is a flawed construct invented by economists who have failed to understand that inconvertible paper money is backed by the assets of its issuer. An arbitrage argument is presented to show that convertibility is irrelevant to the value of paper money, and that fiat money would self-destruct by attracting rival moneys. Some implications for monetary policy are that the issue of money is not inflationary as long as it is backed, and that such an issue will often be economically stimulative.

Introduction

The banker in figure 1 accepts 100 oz. of silver on deposit and issues 100 paper receipts (dollars) in exchange. This is shown in line (1) of figure 1. The paper dollars can be used as money, and assuming the banker maintains convertibility at one ounce per dollar, each dollar will have a market value of one ounce of silver.

A borrower then requests a loan of $200. Assuming a market interest rate of 10%, the borrower might promise to repay $220—either in dollars or in goods of equivalent value—after one year. The banker could make the loan by printing and lending 200 paper dollars to the borrower. For his part, the borrower gives the banker his 1-year, $220 IOU, which is worth $200 today. This transaction is recorded in line (2) of figure 1.

Figure 1

	Assets	Liabilities
(1)	100 oz. silver	$100 paper
(2)	IOU worth $200	$200 paper

The banker's loan triples the supply of paper dollars. One might expect that the value of the dollar would fall—perhaps to one-third of an ounce of silver. This in incorrect. No matter how many dollars are issued, each dollar remains worth 1 oz. of silver as long as the bank obeys the *real bills doctrine*; that is, as long as the bank only issues a dollar for a dollar's worth (or ounce's worth) of assets.[1]

[1] Historically, the real bills doctrine has usually been interpreted as requiring that loans be made for *productive* purposes, and that they be of short duration. In this essay I interpret the real bills doctrine as requiring only that loans be made for sufficiently valuable collateral—a more logically defensible interpretation, and a more natural course for a banker to follow. See Sproul (1998b) for further explanation.

The real bills doctrine holds that the issue of adequately backed money does not cause inflation. This can be demonstrated by assuming that the contrary is true. Suppose, for example, that the tripling of the supply of dollars caused their market value to fall to something less than one ounce of silver. The bank has promised to redeem each dollar for one ounce of silver, so holders of dollars will present them at the bank and demand one ounce of silver for each dollar. Since there are 300 dollars outstanding and just 100 ounces of silver in the bank, it might seem that the bank is unable to redeem all of the dollars it has issued. But in fact the 300 dollars are fully backed by the silver plus the $200 IOU, and the bank is capable of redeeming every dollar it has issued. For example, the bank could sell the $200 IOU for 200 of its own paper dollars. It could then destroy the 200 paper dollars, and be left with 100 outstanding paper dollars laying claim to 100 ounces of silver in the bank. The bank could then redeem each of the remaining 100 dollars for one ounce of silver.

The 100 ounces of silver can be called *real* backing for the dollars, while the IOU, being denominated in dollars, can be called *nominal* backing. Define E as the exchange value of the dollar (oz./$). Since assets (100 oz. plus the $200 IOU) must equal liabilities (300 paper dollars), it must be true that 100+200E=300E, or E=1 oz./$. If the bank lost backing, inflation would result. For example, if the bank were robbed of 20 oz. of its silver, then the above equation becomes 80+200E=300E, or E=0.8 oz./$. If the bank had backed its dollars with 300 ounces of silver and held no IOUs, then the loss of 20 ounces would yield the equation: 280=300E, or E=0.933 oz./$. Note that a higher level of real backing makes the value of the dollar less sensitive to changes in the bank's assets.

Readers who are used to the quantity theory of money might wonder at the contradiction between the real bills doctrine and the quantity theory. How can more money be issued without its value being reduced? One way to answer this is with a stock market analogy: Economists all recognize that a corporation can increase its outstanding shares of stock by any amount, and as long as the new shares are adequately backed by new assets, the value of the stock will not fall. For this reason nobody would claim that the quantity theory applies to corporate stock. The real bills doctrine claims that the same thing is true of money.

The real bills view can also be explained in the context of the equation of exchange, $MV=Py$. If the money supply M rises, then the price level P might be unaffected if either velocity V falls or if the quantity of goods y increases. It should be pointed out that y does not represent the economy's total output of goods, but only the quantity of goods that are bought with the particular kind of money represented by M. Thus, in an economy where only 20% of goods are bought with paper dollars, the supply of paper dollars might be multiplied 5 times, and the result could be that 5 times as many goods are bought with paper dollars, while V, P, and total output of goods might not change at all.

Inflation normally does not occur as long as the bank adequately backs all of its dollars. But one case where the creation of adequately backed paper dollars could cause inflation occurs when paper dollars displace silver money from circulation. For example, people might initially demand silver both for decorative uses and for use as money. Given these two sources of demand, one ounce of silver might have a value equal to one loaf of bread. But if paper dollars displace silver as money, then the demand for silver will fall and the value of an ounce of silver might fall to only 0.8 loaves of bread. Once silver has been

driven down to its "use value" of 0.8 loaves, the creation of additional paper dollars cannot reduce the value of silver any lower. The real bills doctrine will then be fully correct: The issue of adequately backed dollars will not affect the value of the dollar in terms of silver, and neither will it affect the value of silver in terms of other goods.

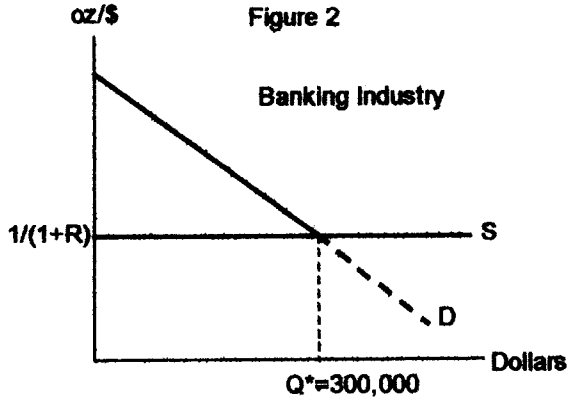
The Irrelevance of Convertibility

If it is costless to issue dollars, then the bank would have to pay the market rate of interest to the holders of its dollars. Otherwise rival banks could outbid the banker for depositors and borrowers. It will be convenient to suppose that the bank's customers deposit 1/(1+R) oz. at the start of the year. Thus the value of a dollar would start the year at 1/(1+R) oz/$, and grow to 1 oz/$ at the end of the year. This would be the case whether the dollar was convertible throughout the year (like an American call option) or was only convertible at the end of the year (like a European call option.). Just as the value of an American call option is equal to that of a European call option, the value of a convertible dollar must be equal throughout the year to the value of an inconvertible dollar.

A bank might initially issue dollars that are convertible into silver on demand. If the market interest rate were 5%, the dollar would be convertible into about .95 ounces at the start of the year, and 1.0 ounces at the end of the year. In the middle of the year, the dollar would be redeemable for approximately .976 ounces. If the bank suspended convertibility in the middle of the year, the dollar would still be worth .976 ounces in anticipation of its being redeemable for 1 ounce at the end of the year. The suspension of convertibility does not affect the value of the dollar.

After the suspension of convertibility, it would clearly be incorrect to claim that the dollar had lost its backing and was therefore fiat money. If convertibility were suspended for an indefinite number of periods, this result still holds. A dollar that is expected to be convertible into one ounce of silver after n periods would be worth $1/(1+R)^n$ oz./$ whether or not it was continuously convertible. A value higher than this would allow bankers to earn profits by issuing dollars, while a value lower than this would leave bankers with no incentive to issue any dollars. With a 1-year time horizon, this means that at the start of the year the industry supply of paper dollars (figure 2) is horizontal at a price of $1/(1+R)$ oz./$.

Note that the bank's customers get the liquidity service of the dollars without having to sacrifice any interest earnings. As long as it is costless to issue the dollars there will always be bankers willing to issue them and pay full market interest on the dollars in spite of the liquidity services received by customers.



The demand for dollars for liquidity purposes is given by D, but if the price of dollars fell below $1/(1+R)$, the demand for dollars as an investment would become infinite, so overall demand is horizontal at $1/(1+R)$, to the right of Q*. (The industry is assumed to contain 1000 banks identical to the bank in Figure 1, hence Q*=300,000.) To the left of

Q*, demand depends on the availability of substitute moneys such as checks, credit cards, foreign currencies, etc. In the limiting case where other moneys are perfect substitutes for paper dollars, demand would be horizontal throughout at a height of 1/(1+R). If few substitute moneys are available, demand would have a negative slope to the left of Q*, reflecting peoples' willingness to pay a premium for the liquidity afforded by paper dollars.

If the quantity of paper dollars were reduced below Q*, then the dollars' usefulness as money could cause them to sell for a premium indicated by the height of the demand curve D. Note that this premium would create a profit opportunity for issuers of dollars. For example, in the case discussed above, a market interest rate of 5% would make paper dollars worth about .95 ounces of silver at the start of the year. But an artificial restriction on the quantity of dollars might make dollars worth .98 ounces at the start of the year. A banker could then issue a dollar at the start of the year for .98 ounces, lend the silver at 5% interest, collect approximately 1.03 ounces of silver when the loan is repaid at the end of the year, and at the same time redeem the paper dollar for 1 ounce, earning a profit of .03 ounces. This profit opportunity would tend to prevent the quantity of dollars supplied from falling below 300,000.

Non-Interest-Bearing Paper Money

Most people are not used to the idea of paper money paying interest. There have been several historical cases where paper money rose in value over time and thus effectively bore interest, but the modern norm seems to be that the value of paper money is either constant or falling over time. Meanwhile, the bank earns interest on its assets, and

seemingly gets a free lunch from the issue of paper money. This idea of a free lunch invites skepticism, and it is not historically correct. In the 1800's, privately-issued paper dollars were not usually profitable to their issuers. They were issued more as an advertisement for the issuing banks.

This misconception can be corrected if we drop the assumption that dollars are issued costlessly. Instead we suppose that each dollar costs C oz/yr to maintain in circulation. This cost would include costs of printing, controlling counterfeiting, periodic redemption, etc. Given this cost, the supply of dollars becomes horizontal at (1+C)/(1+R) oz/$. For example, if R=4% and C=5%, then if the value of the dollar starts the year at 1.0 oz/$,

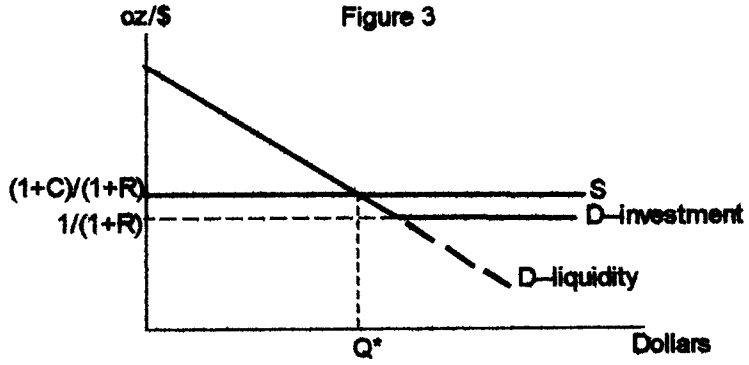


Figure 3

it will fall to .99 oz./$ at year-end. Any other result would create either abnormal profit or abnormal loss for money-issuers. Suppose, in the above example, that the dollar did not fall to .99 oz/$, but stayed at 1.0 oz./$ for the entire year. A banker who issued a dollar for one ounce of silver at the start of the year would lend the ounce of silver at 4% and get 1.04 ounces repaid at year-end. But the paper dollar he issued would have cost .05 ounces to maintain in circulation for the year—a loss to the banker of .01 ounces for each dollar issued. When customers come to claim 1.0 ounces per dollar at year-end, the banker will have only .99 ounces to pay out. The customers who held the dollars, on the

other hand, will have received the liquidity services of the paper dollar for one year, while saving .01 ounces of an expense that at least some of them would have been willing to pay. No paper dollars will be issued in this situation, since they are unprofitable to issuing banks.

If the value of the dollar were too low at the end of the year, then banks would earn abnormal profits. If, for example, the dollars in the above example fell to .98 oz./$ at year-end, then bankers could issue a dollar for an ounce of silver at the start of the year, lend the silver at 4%, and get 1.04 ounces repaid at year-end. The banker could then pay .98 ounces to each dollar-holder at year-end for a gross profit of .06 ounces. After paying the .05 oz. expense of circulating each dollar, the banker has a net profit of .01 ounce for each dollar issued. This profit would motivate banks to issue unlimited amounts of paper dollars. The result of these arbitrage processes is that the supply of dollars is horizontal at (1+C)/(1+R). This result is unaffected if the time period is lengthened from one year to an arbitrary number of years.

In the case where C=R, the cost of issuing and circulating a paper dollar is just equal to the interest the bank earns on the assets it received for the dollar, so a dollar that was convertible into 1 ounce of silver at the start of the year will still be convertible into 1 ounce at year-end or, for that matter, after any number of years. If convertibility were suspended in any year, the value of the dollar would remain at 1 oz./$.

It is a short step to recall that prior to 1933, the Federal Reserve issued paper dollars that were convertible on demand into 1/35 oz. of gold. If C=R, the Federal Reserve could maintain convertibility at 1/35 oz./$ indefinitely. In 1933 the Federal Reserve suspended convertibility for an indefinite number of years n, and the value of the dollar remained at

$$\frac{(1)}{(35)}\frac{(1+C)^n}{(1+R)^n} = 1/35 \text{ oz./\$}$$

The value of the dollar was unaffected by the 1933 suspension of convertibility. It would be an understandable mistake if quantity theorists were to claim that since people could no longer redeem dollars for gold, the dollar was unbacked. If a real-bills adherent were to point out that the Federal Reserve still had the same assets as before, still recognized those assets as "collateral held against Federal Reserve Notes", and still recognized the paper dollars as its liability, then quantity theorists could respond by claiming that those assets were only an archaic relic of the gold standard, with no real significance.

If a real bills adherent pointed out that truly unbacked fiat money creates arbitrage opportunities for the issuers of rival moneys, then I do not believe that a quantity theorist could give an adequate reply. People who believe the dollar is unbacked will usually claim that dollars have value because of supply and demand. The government limits the supply of dollars, while people demand dollars because of their usefulness for making trades, paying taxes, etc. If this were true then the Federal Reserve could issue paper dollars for (say) one ounce of silver each, then suspend convertibility and spend the silver like the free lunch that it is. As long as the Federal Reserve did not issue any more dollars, the paper dollars would remain worth 1 oz./\$--held up only by the forces of supply and demand.

This free lunch would attract rival moneys, and not just for dollars. For example, the Mexican central bank might issue paper pesos that were initially convertible into 1 oz. of silver, and those paper pesos might circulate as money. If the quantity theory were correct, then the Mexican central bank could eventually suspend convertibility and spend

its silver on lavish homes for the bank's officers. As long as the quantity of paper pesos was not increased, the quantity theory implies that their value would be maintained by supply and demand.

The profit earned by the Mexican central bank would create a profit opportunity for rival banks, including the American central bank. That bank, by assumption, is also capable earning a free lunch by the issue of paper money, so the American central bank would make every effort to circulate its paper dollars in Mexico. As the dollars invade Mexico, the demand for paper pesos would fall and, on quantity theory principles, the paper pesos would lose value. As the peso lost value the demand for pesos would fall still further, so the value of the peso would continue to fall with no stable solution short of zero value.

In the face of this rivalry, how does the peso manage to have any value at all? The answer is that the value of the peso is not determined on quantity theory principles. The peso's value, like every other paper currency, is equal to its backing. No matter how many paper pesos are displaced from circulation by dollars, the value of the peso will always be determined by the assets and liabilities of the Mexican central bank.

Tax Backing

There have been many historical cases of paper currencies being issued by governments that appeared to have no assets at all backing their currency. American colonial currencies, for example, were often issued by nearly bankrupt governments, and were not convertible into metallic currency. How can such currencies be said to be backed?

The answer is that the American colonies did have assets, principally their ability to collect taxes. The colonies would typically rate the value of their paper currency in terms of coins, metal, or some other commodity. For example, the colony of New York declared that its paper shillings were equal in value to silver shilling coins, and made them acceptable for taxes at that rate. Thus a colonist with a tax liability of 8 silver shillings could pay that tax either with 8 silver shillings or with 8 paper shillings. In this case the paper shillings were backed not by New York's (nonexistent) ability to *pay out* silver shillings on demand, but by New York's ability to *take away* silver shillings as taxes. If New York lost the ability to collect taxes, then its paper shillings would fall just as in the case of a bank that loses the ability to pay out silver for the paper dollars it has issued. This view is in substantial agreement with the evidence presented by Smith (1985) and Sargent (1982), among others.[2]

> When colonial currencies were carefully backed by future governmental surpluses, they held their value remarkably well. When such backing was not carefully provided, depreciation was the rule. The quantity of bills issued, on the other hand, bears little relation to currency values, or to colonial price levels. (Smith, 1985a, p. 156.)

[2] The Smith-Sargent view produced a number of replies (e.g., McCallum (1992), Michener (1987, 1988), Laidler(1987)). My reasons for favoring the Smith-Sargent view are discussed in Sproul (1998).

Figure 4

	ASSETS	LIABILITIES
1)	100,000 shillings taxes receivable	100,000 shillings net worth
2)		+20,000 paper shillings -20,000 shillings net worth
3)	-8,000 shillings taxes receivable	-8,000 paper shillings

In line (1) of figure 4, it is assumed that a colony's only asset is 100,000 shillings of taxes receivable. If the colony has no claims against it, then its net worth at this point is 100,000 shillings.

Line (2) shows the effects of the colony printing 20,000 paper shillings and, let us suppose, giving them away. The effect is to reduce the colony's net worth by 20,000 shillings. But the shillings are more than adequately backed by the 100,000 shillings of taxes receivable, so every paper shilling will still be worth 1 silver shilling. It is apparent that the colony can safely issue up to 100,000 paper shillings without causing inflation, but if it exceeded that amount, then inflation would result as the colony's currency issue outruns its assets.

Line (3) shows the effects of a tax collection. As the colony receives and retires 8,000 paper shillings, it simultaneously reduces taxes receivable by 8,000 shillings. Most colonies issued paper shillings on the condition that those shillings would gradually be retired as they were collected in taxes. On real bills principles the retirement of 8,000

shillings would not affect their value[3], since the quantity of paper shillings falls in step with their backing. But we should not be surprised to find that such a reduction in the quantity of money was recessionary.

> "The retirement of a large proportion of the circulating medium through annual taxation, regularly produced a stringency from which the legislature sought relief through postponement of the retirements. If the bills were not called in according to the terms of the acts of issue, public faith in them would lessen; if called in there would be a disturbance of the currency. On these points there was a permanent disagreement between the governor and the representatives, discussions concerning which reveal themselves in 1715 and traces of which are frequently found after that date." (Davis, 1910.)

The central controversy of monetary theory thus emerged at an early date. On one side of the controversy, 'tight money' advocates feared inflation. On the other side, 'easy money' advocates feared recession. Unfortunately, both sides accepted the idea of fiat money, and neither side seems to have understood the role of backing. Tight money advocates did not see that the quantity of money could safely be increased without causing inflation as long as it was adequately backed. Easy money advocates failed to see that there is no benefit in simply increasing the quantity of money. If there is no corresponding increase in backing, the value of money will fall in proportion to the new issue. The real value of the public's money holdings will thus be unchanged, and the new issue of money will give no stimulus to the economy.

[3] Unless the quantity of shillings was restricted sufficiently to make them sell for a premium, as in figure 3.

Conclusion

The main results of this analysis are

1) An increase in the quantity of money is normally not inflationary, as long as the money is adequately backed.

2) Convertibility is irrelevant to the value of paper money. Thus inconvertible paper money gives a false appearance of being fiat money, when in fact it is backed by the assets of its issuer.

3) If fiat money existed, that would create profit opportunities for the issuers of rival moneys. Rival moneys would be issued as long as their value exceeded their backing, so the value of fiat money would be driven to zero.

4) Misunderstandings of the nature of backed money have led to bad monetary policies. Easy money policies have caused inflation by failing to adequately back money, while tight money policies have caused recessions by failing to issue enough money.

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