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Abstract

The law of reflux is explained using an example of backed money. In the example, government-issued money is backed by the government's assets (mainly taxes receivable) while bank-issued money is backed by the bank's assets. The value of both kinds of money is determined by the amount of backing held per unit of money issued. The example shows that reflux maintains money's value, not by assuring that excessive issues of money reflux to their issuers, but by providing people with access to the assets backing their money. Conventional metallic convertibility is only one channel of many through which money can reflux to its issuer. The suspension of metallic convertibility still leaves many other open channels of reflux, but can create the illusion that money is unbacked fiat money that was somehow forced into circulation. Backed money will hold its value as long as its issuer remains solvent. One way for an issuer to stay solvent is to issue money in exchange for short-term real bills of adequate value, but as long as the bills are of adequate value, it is largely unnecessary for the bills to be real or short-term.

Key words: Reflux, real bills, money, backing theory
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Introduction

The law of reflux asserts that banks do not cause inflation through over-issue of money, since any excess money would quickly return to the issuing bank, usually as deposits, loan repayments, or for redemption in base money. Some areas of confusion over the law of reflux have concerned its relation to the real bills doctrine, its application to currencies that are convertible versus those that are inconvertible (Skaggs, 1991, Glasner, 1992), and its relevance to ‘forced’ currencies. In this essay I try to clarify these issues with an example of a banking system in which the value of any type of money is determined by the assets backing that money, and not by the principles of the quantity theory. I find that reflux helps to preserve the value of money, not because it prevents the quantity of money from rising excessively, but because it provides money-holders with various channels of access to the assets backing their money. Some implications are that there is no such thing as fiat money, that the real bills doctrine has been misunderstood and wrongly rejected by economists, and that the law of reflux is just as relevant to currencies that are convertible, inconvertible, or forced into circulation.

A Sample Monetary System

Assume that a government’s only asset is its ability to tax an area of land. The tax is set at 50 oz. of silver per year for the entire area, and is assumed to be unalterable. If the market interest rate is 5%, the present value of all future tax collections, in perpetuity, is $50/.05=1000$ oz. of silver. Assume the government’s existing bond obligations have a present value of 400 oz. of silver, leaving the government with a net worth of 600 ounces. The government’s T-account is given in Table 1. (This example is meant to mimic the issue of paper money by the American colonies, starting with the Massachusetts Bay colony in 1690 (Davis, 1910)).

Table 1

Assets	Liabilities
(1) taxes receivable worth 1000 oz.	600 oz. net worth
(2)	400 oz. bonds payable

Next, a failed military action leaves the government owing 100 oz. in wages (Table 2, line 3), which reduces the government’s net worth by 100 oz. (line 4). The colony pays these wages by printing paper money that it declares acceptable for 100 oz. worth of tax obligations (lines 5 and 6). Let each unit of the paper money be called a “shilling” and assume 1 shilling is acceptable for a 1 oz. tax obligation.

Table 2

(3)	+100 oz. wages payable
(4)	-100 oz. net worth
(5)	+100 oz. paper shillings paid in wages
(6)	-100 oz. wages payable

The shillings have value because they are acceptable for taxes. Had those shillings been issued by a private bank, they might have given their holder the right to demand 1 oz. of silver from the issuing bank. The government-issued shillings described above, rather than giving their holder the right to *demand* 1 oz. of silver from the government, relieve their holder from having to *pay* 1 oz.

to the government. Just as money issued by a private bank would have been backed by the assets of that bank, the shillings issued by the government are backed by the government's assets—in this case by taxes receivable. Note that the ability to issue money is not limited to governments and banks. For example, a private landowner could issue his own paper shillings, just by making those shillings acceptable for his land rents. Line 1 of Table 1 would have to be changed from 'taxes receivable' to 'rents receivable', but that would be the only notable difference between privately-issued shillings and government-issued shillings.

It is important to point out that the concept of tax backing is different from what is commonly called the "State Theory" or "Chartalist" theory of money (Knapp, 1924). Chartalism asserts that the government creates or increases the demand for money by making it acceptable for taxes. This demand for money, coupled with a limited supply of money, is said to be what gives money its value. The tax backing theory, in contrast, claims that money is valued on exactly the same principles as any accounting liability. The two theories have different implications. The tax backing theory implies, for example, that if the government (or the private landowner mentioned above) were robbed of a significant amount of its assets, then its money would lose value. Chartalism implies that the robbery would not affect the value of money, as long as tax collections (or rent collections) were unaffected.

Table 3

Assets	Liabilities
(7)	+200 oz. paper shillings given away
(8)	-200 oz. net worth

In Table 3, line 7, the government prints 200 new paper shillings and gives them away. This reduces the government's net worth by 200 oz., from 500 oz. to 300 oz. Since net worth is still positive, the government is still able to buy back all of its shillings at the rate of 1 oz. per shilling, so the shillings hold their value in spite of the increase in their quantity. But assuming there has been no change in the public's desire to hold paper shillings, the 200 extra shillings must reflux to the government. The government might sell 200 oz. of its taxes receivable for 200 oz. of silver, which it could use to redeem and retire the 200 extra shillings. Or the government could sell 200 oz. worth of its taxes receivable directly for the extra 200 shillings, which it could then retire. Or the government could issue 200 oz. worth of new bonds, which it could use to redeem and retire the extra shillings. Note that if the government failed to buy back (reflux) the unwanted shillings in some way, the government would be failing to back the shillings, and the shillings would lose value. The government must not only be *able* to buy back its shillings; it must also be *willing*.

Because these shillings are backed by the government's assets, the quantity theory of money is irrelevant to their value. Instead, the shillings are valued as liabilities of the government in accordance with the backing theory of money, which holds that the value of money is equal to the value of the assets backing that money. An increase in the quantity of shillings is normally not inflationary, so long as the government has enough assets to buy back all its shillings at their par value of 1 oz. per shilling. If, for some reason, the street value of the shilling dropped to .99 oz., then the government could restore their value to 1 oz. by selling the rights to 300 oz. worth of taxes receivable for 300 actual ounces of silver, then using the silver to buy back all 300 of its shillings at 1 oz. each. Note that this buy-back could only be accomplished by a government with adequate assets, and the willingness to use those assets to buy back its currency.

In principle, the government could safely issue additional shillings until it reduced its net worth to zero. Starting from its position in line 8, where the government's net worth was 300 oz., the

government could issue and give away up to 300 more shillings without causing inflation. But if, after its net worth had reached zero, the government issued still more shillings without getting assets of adequate value in return, then inflation would result. For example, at line 8 the government's only asset was 1000 oz. of taxes receivable, while claims against the government consisted of 400 oz. in bonds and 300 oz. of paper shillings. Assume that the bonds have legal priority over the paper shillings. If the government then issued and gave away 900 additional paper shillings, then after using 400 oz. of taxes receivable to retire the 400 oz. of bonds, the government would have 600 oz. worth of assets backing 1200 paper shillings, so each shilling would be worth 0.5 ounces. (Note that the government could have caused the same degree of inflation by issuing and giving away 450 oz. worth of government bonds. Loose fiscal policy has the same inflationary effect as loose monetary policy.)

The shillings issued in line 7 are given away--an extreme form of an easy money policy--which reduces the government's net worth. A more normal method of issue is shown in Table 4, line 9, where the government issues money in exchange for assets of equal value. The government issues an additional 350 paper shillings, which it uses to buy a building worth 350 oz. of silver. This issue of shillings leaves net worth unchanged at 300 oz., since assets rise in step with the issue of money. Here again, this issue of shillings is not inflationary as long as the government is willing and able to buy back its shillings at par. If the shilling fell in value to .99 oz. of silver, the government could restore its value to 1 oz. by selling the building for 350 oz. of silver, and using the 350 oz. to keep buying back (i.e., refluxing) shillings until their market value rose to 1 ounce. Alternatively, the government could sell its building directly for 350 of its paper shillings, which it could then retire.

Table 4

(9) +Building worth 350 oz.	+350 oz. paper shillings spent on building
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A Central Bank

Table 5 marks the government's creation of a central bank. Assume that the central bank is not independent, but is merely the money-issuing branch of the government. The central bank's first act is to accept 100 oz. of silver on deposit, for which it issues 100 paper shillings (line (10)).

Recall that the government had already issued 650 paper shillings before the central bank issued its 100 shillings. Thus 650 of the circulating shillings are a claim against the government (redeemable for taxes), while the other 100 shillings are a claim against the central bank (redeemable for silver). This split system of issue does not cause trouble as long as the central bank is just a branch of the government. But if the central bank were to become completely independent of the government, then the government and the central bank would normally have to redeem only the shillings that they themselves had issued. I assume for now that the central bank is not independent, so that all paper shillings are interchangeable.

Table 5: The Central Bank

Assets	Liabilities
(10) +100 oz. silver	+100 oz. paper shillings
(11) +Farmer's IOU worth 200 oz.	+200 oz. paper shillings
(12) +300 oz. bonds (from line 2)	+300 oz. paper shillings

In line 11, the central bank opens a lending window and makes a 200 shilling loan to a farmer. Assuming the loan is made at the market rate of interest against adequate collateral, the farmer's IOU would be worth 200 ounces. As the loan is made, the government's assets rise in step with its issue of paper shillings, so once again the issue of new money causes no inflation.

In line 12, the central bank begins open-market operations by printing 300 paper shillings and using them to buy 300 oz. worth of government bonds. The new paper shillings are adequately backed by the 300 oz. of bonds, so here again there is no inflation. But note that the action in line 12 has only replaced one government liability (300 oz. of bonds) with another (300 shillings).

Convertibility and the Channels of Reflux

The paper shillings issued so far have 4 obvious channels of reflux to the government:

- 1) A paper shilling can be paid to the government in settlement of taxes, whereupon the government retires the shilling.
- 2) A paper shilling can be redeemed for 1 oz. of silver at the central bank, which retires the shilling.
- 3) The farmer can repay 1 paper shilling on his loan, and the central bank retires the shilling.
- 4) The central bank can sell 1 oz. worth of its bonds to the public, and retire the paper shilling it receives for the bond. (In this case reflux is initiated by the central bank, rather than by the public.)

Assuming that the public's desire to hold shillings has not changed, the shillings issued in table 5 will cause an equal amount of shillings to reflux to their issuers, but not all of these channels of reflux need be open in order for the law of reflux to operate. For example, the central bank might suspend physical convertibility of the shilling into silver. This closes reflux channel #2, while leaving all others open. These other open channels are more than enough to redeem all of the paper shillings issued. At line 12 in Table 5, the government had issued a total of 1250 paper shillings (600 by the central bank and 650 by the government proper). But the value of the government's net assets is 1650 ounces (net of 300 oz. worth of its own bonds). This is enough to buy back all 1250 shillings at their par value of 1 oz., even if the government never pays out its 100 oz. of silver.

The number of potential reflux channels is much larger than just the four listed above. Shillings can reflux to the government when the government sells off buildings or used furniture, or with any number of other transactions, up to and including the unwinding of the government's financial position, as might occur if the government were dissolved or went bankrupt. Each of these channels of reflux represents a form of convertibility. If the government sells used furniture in exchange for its own paper shillings, then those shillings have been made convertible into furniture, even though they might be denominated in silver. If the government accepts paper shillings for loan repayments, then those paper shillings are convertible into debt relief.

My use of the word "convertible" is much broader than economists might be used to. A financial securities that gives its owner the right to claim some underlying asset at any time is normally called "convertible". Another security might give its holder the right to claim the same underlying asset, but only at maturity, and this security is normally called "inconvertible". I hope I will not cause confusion when I say that both securities should be called convertible, in the sense that both give a claim to an underlying asset. A great deal of misunderstanding can be caused by failing to recognize that convertibility can take many forms. For example, economists usually speak as if there are only two kinds of currencies: those which are convertible into physical amounts of

metal, and those which are inconvertible. But the number of forms of convertibility is as large as the number of channels of reflux. Convertibility, like reflux, can be physical or financial, instant or delayed, certain or uncertain, restricted to some customers or open to all, at the customer's option or at the issuer's option, etc. Some reflux channels, like the metallic convertibility channel, operate without the government taking any initiative. Other reflux channels, like the furniture channel, require government action in order to operate, and a failure to act on the part of the government can have the same effect on the value of money as a loss of government assets.

What maintains the value of the shilling? Is it reflux or is it backing? Clearly it is backing that is of primary importance. Without assets backing the shillings, the government is not capable of buying them back, and no reflux is possible. But reflux also matters, since it is only through some kind of reflux (i.e., some kind of convertibility) that the assets backing a currency can ever be paid to currency holders. This means that restrictions on reflux can have the same effect as a loss of backing. For example, if the closing of some reflux channel puts 10% of previously available assets permanently out of reach of all currency holders, then the bank has effectively defaulted on 10% of its obligations, and its currency must lose 10% of its value.

Even if all reflux channels were closed, some of those channels might be expected to re-open in the future. For example, all possible channels might be closed now, but the central bank might promise to resume physical convertibility into silver in 1 year. If the market interest rate is 5%, a shilling would trade at about .95 oz. today, in anticipation of being redeemed for 1 oz. in 1 year. The shilling would yield the market rate of interest of 5%.

It might seem strange for paper money to bear interest, but if paper shillings bore no interest, then in the absence of any printing and handling costs, a government or bank could issue zero-interest shillings in exchange for bonds that yielded the market rate of 5%. That government or bank would earn a 5% free lunch each year. This free lunch would attract rival governments or banks, which could win customers by offering competing paper shillings that started the year worth .99 oz., and rose to 1.0 oz. after 1 year, thus bearing 1% interest. Those rival governments or banks would earn a 4% free lunch. Competing currencies would continue entering the market until the paper shilling bore 5% interest, and the free lunch disappeared.

If the cost of issuing and handling a paper shilling amounted to 2% of its value each year, then the no-free-lunch condition would leave the shilling yielding only 3%. It would start the year worth .97 oz., and rise to 1 oz. at year-end. If the handling cost of a shilling amounted to 5%/year, then the shilling would pay no interest, and would be worth 1 oz. throughout the year. But as long as the shilling provided enough liquidity services to its holder, people would hold them in spite of earning little or no interest. This kind of currency could give the illusion of being unbacked, since all forms of reflux could be delayed indefinitely. For example, if the printing and handling costs of a shilling amounted to 7% of its value each year, then at a market rate of 5%, the shilling would annually lose 2% of its value for an indefinite number of years, assuming that the shilling yielded enough liquidity services to justify its negative return.

Backed money versus Fiat Money

A paper money that cannot be redeemed for a physical amount of metal could give the false impression that it is unbacked, when in truth just one channel of reflux has been closed. We therefore have reason to think that fiat money itself is an illusion (Sproul, 2003), and that economists, seeing that most modern paper money is not physically *convertible*, wrongly concluded that it is *unbacked*.

While we have no reason to believe that modern paper money is fiat money, there are at least two reasons to believe that there is no such thing as fiat money:

1) The issuer of fiat money gets a free lunch. The textbook view of fiat money is that its value is determined solely by money demand and money supply, and not by backing (e.g., Mankiw, 2008, p. 361). This view implies that a money-issuing government or central bank could spend or throw away its assets, and as long as the supply of money was unaffected, the money would hold its value. Those assets are a free lunch to the issuer of money. If neighboring countries have issued fiat moneys of their own, then they each stand to gain if their currencies circulate in other countries. But as foreign currencies enter the circulation of some country, the demand for the domestic country's money will fall, reducing its value. Competition between rival moneys thus assures that money's value cannot exceed the value of its backing. In the limiting case of no backing, money must have no value.

2) Believers in fiat money must ask why central banks bother to hold assets. If the value of paper money is determined by money supply and money demand alone, then somewhere in the historical record we should be able to find some bank, central or otherwise, that issued money (of positive value) without holding assets against that money. I do not know of any such bank, and I do not expect to find one, because such a bank would violate the no-free-lunch principle. One sometimes comes across currencies such as the Iraqi Swiss Dinar (Varian, 2004), which continued to have value even though it was issued by a defunct government, but the Dinar was ultimately redeemed in another currency by the new government, so its positive value reflected the expectation of future backing by (and reflux to) the new government.

Fixed versus Floating Currencies

I have assumed until now that the shilling is pegged to 1 oz. of silver, either by being directly redeemable for 1 oz., or by being acceptable for taxes, loan payments, etc. in place of 1 ounce. Table 6 combines the T-accounts of the government and the central bank. At line 4, the government has 1650 oz. worth of assets against 1350 oz. worth of liabilities, giving it a positive net worth of 300 ounces. In this condition, the government is more than capable of buying back all of its liabilities at their par value of 1 oz. per shilling.

Table 6

Assets	Liabilities
(1) Taxes receivable worth 1000 oz.	300 oz. net worth
(2) 100 oz. silver	1250 oz. paper shillings
(3) Farmer's IOU worth 200 oz.	100 oz. bonds payable (net)
(4) Building worth 350 oz.	

In line 5 of Table 7, some unforeseen crisis suddenly forces the government to pay 500 oz. in wages. This new obligation reduces net worth by 500 oz., from +300 oz. to -200 ounces. The government is no longer able to buy back all its liabilities at par, so the shillings or the bonds, or both, must lose value. I will assume that the bonds and wages payable have legal priority over the paper shillings, so the entire effect of the government's loss is confined to the shillings. Upon liquidation of the government, 600 oz. of taxes receivable could be cancelled against the 600 oz. worth of outstanding bonds and wages payable. This would leave (400+100+200+350)=1050 oz.

of assets backing 1250 shillings, so the exchange value of the shilling is $1050/1250=.84$ oz./shilling.

Table 7

(5)	+500 oz. wages payable
(6)	-500 oz. net worth

Note that the shilling falls to .84 whether the government officially devalues the shilling to an affordable level or simply suspends physical convertibility into silver. Either way, the balance sheet dictates that the shilling must be worth .84 ounces.

If convertibility is suspended, the shilling is no longer pegged to silver, but is floating. It is now even more tempting for an observer to think that the shilling is unbacked fiat money, and that the government's assets are irrelevant to its value. But suppose this were true. Suppose that in spite of the government's 500 oz. loss, the shilling continued to trade on the open market for 1 ounce. The government would have managed to issue 1850 oz. worth of obligations, while holding only 1650 oz. worth of assets, a free lunch to the government of 200 ounces. This would create a profit opportunity for issuers of rival moneys, and competition from rival moneys would force the value of the shillings into line with their backing. The implication is that all government-issued moneys must be valued according to their backing, even when some forms of convertibility have been suspended.

Once a currency is floating, and all attachments to silver have been cut, it is possible to reach a situation where all of the government's assets and liabilities are denominated in shillings. At this point it might appear that the government is backing its shillings with nothing but promises of more shillings, and this circular backing appears to be no backing at all. The simplest answer to this objection is that all governments have physical assets such as buildings, land, etc. If some government's only liability is 400 paper shillings, and if that government's only asset is an IOU worth 200 oz. of silver, then each shilling must be worth $\frac{1}{2}$ ounce. If the government then makes a bookkeeping entry that records the IOU as being worth 400 shillings, the street value of a shilling will still be $\frac{1}{2}$ ounce. The value of the shilling is determined by the value of the government's assets, regardless of the denomination of those assets. (Cases where denomination does matter are explained in Sproul, 2003.)

Private Banks

Table 8 completes the picture of the banking system by adding private banks. I will assume that the bank in Table 8 is one of many competitive banks, all of which have similar T-accounts.

Table 8: A representative private bank

Assets	Liabilities
(1) +10 paper shillings deposited	+10 checking account shillings
(2) +Borrower's IOU worth 90 paper shillings	+90 checking account shillings

The private bank starts business by accepting 10 government-issued paper shillings on deposit,

and issuing a 10-shilling checking account to the depositor (line 1).

In line 2 the bank lends 90 checking account shillings to a borrower. Assuming the loan is made at the market rate of interest, on adequate collateral, the borrower's IOU is worth 90 shillings. (The IOU will sell for 94.5 shillings after 1 year, assuming a 5% rate of interest.) This loan increases the bank's issue of checking account shillings by 10 times, but the bank is still capable of redeeming each checking account shilling for 1 paper shilling. If a bank run occurred and all 100 checking account shillings were presented at once for payment (an extreme form of reflux), the bank could either sell its IOU for 90 paper shillings, or else sell the IOU for 90 of its own checking account shillings. Either way, the bank is able to retire all of its checking account shillings at par. As long as private banks are constituted in this way, one checking account shilling will always be worth 1 paper shilling, no matter how many checking account shillings are issued.

If a widespread bank panic is in progress, the bank might find itself forced to sell its IOU into an illiquid market at a discount. If the bank can get only 80 paper shillings for the IOU, then the 100 checking account shillings would be backed by assets worth only 90 paper shillings in total, and the value of a checking account shilling would fall to .90 paper shillings. This might seem to contradict the idea that the issue of adequately backed shillings does not cause inflation, but the checking account shillings lost value *because* of the loss of bank assets. If that bank had possessed an additional 10 paper shillings worth of other capital, it could have made good the 10-shilling loss on the IOU, and the checking account shillings would have held their value against paper shillings.

Historically, private banks have usually dealt with bank panics by suspending convertibility (Rolnick, et. al. 2002). For example, the bank in Table 8 might face the choice of either selling the IOU today at the low price of 80 paper shillings, (and redeeming each checking account shilling for 0.9 paper shillings) or else suspending convertibility until such time as the bank might get a better price for the IOU. If customers expect a better price, they will prefer suspension to liquidation.

Table 8 shows two channels of reflux for the private bank.

- 1) Checking account shillings can reflux to the bank in exchange for paper shillings.
- 2) Checking account shillings can reflux to the bank as loan repayments on the IOU.

It is clear that there are many other channels for checking account shillings to reflux to the bank, up to and including liquidation of the bank. But since checking account shillings exist only as entries in the bank's financial records, they can reflux to the bank for the trouble of making a bookkeeping entry. The principles governing the reflux of paper shillings to an issuing bank are really no different, but the reflux of paper shillings will be more visible to the banker, as unwanted paper shillings will pile up in his vault, rather than just being extinguished on his books.

What maintains the value of the private bank's checking account shillings? Just as in the case of government-issued money, the answer is that backing is of primary importance, but the bank must also have enough open channels of reflux to allow currency holders full access to the assets backing the money. Economists have often claimed that convertibility by itself can give money value (e.g., Smith, 1776, Fullarton, 1844), but convertibility without backing cannot assure value. If a bank has issued 100 checking account shillings, backed by assets worth only 99 paper

shillings, then the attempt to maintain convertibility at 1 oz/shilling only invites a bank run, as customers scramble to redeem their checking account shillings for paper shillings before the bank's assets are depleted.

The Banking System

The banking system outlined above consists of a government whose paper shillings are backed by the government's assets, and private banks whose checking account shillings are backed by the assets of the private banks. The two main questions of interest are:

- 1) How do private banks, through their issue of checking account shillings, affect the price level?
- 2) How does the government, through its issue of paper shillings, affect the price level?

The answer to both questions is the same: As long as new shillings are only issued in exchange for a shilling's worth (or ounce's worth) of assets, and as long as there are enough open channels for shillings to reflux to their issuer, the issue of new shillings will not affect the price level. If private banks were to issue shillings without getting assets of adequate value in exchange, then the private bank's shillings would lose value relative to paper shillings. The value of the paper shillings would be unaffected, since the actions of private banks do not affect the assets or liabilities of the government. The story is different if the government issued new paper shillings without getting assets of adequate value. The loss of backing would cause paper shillings to lose value. But private shillings are usually pegged to the government's paper shillings, so if paper shillings fall to (say) 0.9 oz., then the private shillings, being normally denominated in paper shillings, would lose value as well. The wealth of the private bank shown in Table 8 would be unchanged by this, since both its assets and liabilities are denominated in paper shillings. But if, for example, the bank had issued checking account shillings that were denominated in paper shillings, while its assets were denominated in oz. of silver, the private bank would be richer because of the depreciation of paper shillings.

Nowadays people are used to a money system where central banks issue paper money that is physically inconvertible, while private banks issue checking account money that is convertible into the central bank's money. But many other money systems are possible. For example, the central bank might issue nothing but checking account money that is physically convertible into metal, while private banks might issue paper money that is not physically convertible into the central bank's money. Regardless of how the money system is constituted, the value of any bank's money is determined by the assets held by that bank, as well as by the various reflux channels that provide customers with access to those assets.

The Real Bills Doctrine

The mainstream view of the real bills doctrine, and its relation to the law of reflux, is explained by David Glasner:

The question I wish to address briefly in conclusion is whether the real-bills doctrine as applied to individual banks really does solve the problem that the law of reflux raises for them. Unlike the question of whether the version of the real-bills doctrine that applies to an entire banking system is valid (to which the answer is, of course, no), this question does not admit of a straightforward, logically compelling answer. The question is a pragmatic one--actually several

related pragmatic ones. Does this version of the real-bills doctrine enable a bank to alter the volume and composition of its liabilities quickly? Does it do so at a reasonable cost? And are there any alternative operating strategies that would do the job as well or better?

The real bills doctrine asserts that banks should only issue money in exchange for bills that are

- (1) of adequate value
- (2) real
- (3) short term

I have never seen any prominent writer on the real bills doctrine specifically focus on item (1), that bills should be of adequate value. This is probably because it is too obvious to be worth mentioning. Clearly, no sensible banker would intentionally issue 100 shillings in exchange for a bill worth only 99 shillings. But every banker knows that the importance of item (1) cannot be overstated. A banker who only issues money in exchange for bills of adequate value will stay solvent and, according to the backing theory, will avoid inflation. But take away items (2) and (3), and the real bills doctrine is identical to the backing theory. Of course the backing theory places almost no importance on items (2) and (3). As long as a bill is backed by collateral of adequate value, a lending bank has no reason to care if the bill was issued by a farmer or by a gambler, and the banker has very little reason to care if the bill is payable in 30 days or 30 years, especially if 30-year bills can be easily sold for ready cash.

It is unfortunate that critics of the real bills doctrine have focused upon items (2) and (3)--on the question of whether issuing money for short-term real bills will tend to make the quantity of money move in step with the economy's output of goods, and thereby prevent inflation. Clearly, a bank that issues 100 shillings in exchange for assets worth only half that much will cause its shillings to lose value, whether or not those assets consist of short term real bills, and whether or not the quantity of money moves in step with the economy's output of goods.

It is this misguided focus on items (2) and (3) that leads Glasner and others to wrongly claim that the real bills doctrine is not valid for an entire banking system. If the real bills doctrine is understood, as it should be, to require only that money be issued in exchange for assets of adequate value, then in a banking system where all banks issue money in exchange for assets of adequate value, the quantity of money will automatically move in step with the assets backing that money, and inflation will be avoided both by individual banks and by the banking system as a whole.

Recall that in line 11 of Table 5, the central bank issued 200 paper shillings in exchange for a farmer's IOU worth 200 ounces. The farmer's IOU could meet the definition of a "real bill", as long as it serves to finance productive activity by the farmer. According to the usual understanding of the real bills doctrine, the issue of 200 paper shillings in line 11 would not cause inflation because the money supply moves in step with the production of goods. But the example makes it clear that the central bank could have just as well issued the 200 shillings to a gambler on his way to a casino, as long as the gambler offered collateral of adequate value to cover his IOU. According to the backing theory it is not necessary for the 200 shilling IOU to meet the strict definition of a short-term real bill. The IOU only needs to be worth at least 200 ounces.

Reflux in a Backing Theory Model

The standard view of the operation of the law of reflux is that it "assures the impossibility of inflation produced by overexpansion of bank credit" (Blaug, 1978). In this context, "bank credit"

is understood to mean privately-issued money, such as the checking account shillings in Table 8. On this view, an expansion of bank credit (checking account shillings) might increase the total money supply (paper plus checking account shillings). This leads to the familiar textbook case of ‘more money chasing the same goods’, and inflation supposedly results.

But the backing theory holds that an increase in the money supply, *accompanied by an equal increase in backing*, will not cause inflation, even if the supply of money rises relative to the quantity of goods available. As private banks issue one more checking account shilling, the banks will automatically acquire new assets worth one paper shilling. Thus each checking account shilling remains worth one paper shilling, no matter how many checking account shillings are issued.

I expect that quantity theorists would allow that a new issue of checking account shillings, *adequately backed*, would not cause checking account shillings to depreciate relative to paper shillings. But the quantity theory goes beyond this, and asserts that the increased quantity of checking account shillings would reduce the demand for paper shillings, causing the paper shillings themselves to fall in value relative to silver. But on backing theory principles this cannot happen. The central bank still holds assets worth 1 oz. of silver for every paper shilling it has issued, so every paper shilling must still be worth 1 ounce, no matter how many checking account shillings are issued. Even if the central bank itself issued more paper shillings, there would still be no inflation since the central bank automatically gets new assets worth one oz. every time it issues a new paper shilling.

Does the law of reflux prevent inflation? No. *Adequate backing* prevents inflation. The law of reflux only assures that if any bank or government issues more shillings than the public wants to hold, any unwanted shillings will reflux to their issuer. If the public’s desire for both paper shillings and checking account shillings fell, then both kinds of shillings would reflux to their respective issuers through the channels mentioned above. As the shillings reflux, their former holders will get assets worth 1 oz. of silver, either from the government or from private banks. The same process works for full-bodied coins. If people have more coins than they can use in trade, then the coins will reflux to bullion as the coins are melted. Conversely, if people want more coins than they have, then the reflux process will reverse as bullion is stamped into coins. The value of coins is preserved, not by the reflux, but by their backing, which in this case consists of the metal content of the coin itself.

With adequate backing, all the shillings issued by a government or bank can reflux to their issuers in exchange for assets worth 1 oz. of silver. Without adequate backing there will still be a reflux, but that reflux will not preserve the value of the shillings. For example, if the government tries to back 100 shillings with assets worth only 99 oz., and if the government tries to maintain convertibility at the unaffordable rate of 1 oz./shilling, then all 100 shillings will immediately reflux to the government through any reflux channels available. The first 99 shillings will be redeemed for assets worth 1 oz., and the last shilling in the queue will lose all value. In this case the reflux takes the form of a bank run, or more precisely a run on the government’s assets. This type of reflux, rather than preventing inflation, actually causes inflation, as the bank run depletes the bank’s assets.

A Forced Issue of Money

Writers on the law of reflux have often spoken of the “forced issue” of inconvertible government paper money. Fullarton’s discussion is typical.

“...the recipients of a forced issue of government-paper, who have no means of turning their acquisitions to use but by sub-mitting to part with them at a reduced value.

...

The compulsory issues of governments are usually in payment for the personal expenditure of the Sovereign, for public works and buildings, or for the maintenance of civil, naval, and military establishments,...paper created and so paid away by the government, not being returnable to the issuer, will constitute a fresh source of demand, and must be forced into and permeate all the channels of circulation," (Fullarton, 1844, p. 65.)

Fullarton's error becomes apparent once we recognize that a so-called forced issue of government paper actually is returnable to the government in payment of taxes, repayment of loans, purchase of bonds or goods from the government, etc. If the government buys back (i.e., refluxes) its currency, then the currency is a true liability of the government and will be valued on the same principles as any other liability claim. If the government spends newly-issued currency on public works, etc., then as long as those public works create new assets for the government, and as long as those new assets are at least equal in value to the new currency issued (as in line 9 of table 2), then this so-called forced issue will not cause inflation. Nor does the new currency create a fresh source of demand, since nobody's net worth is changed when a new issue of currency merely swaps currency for an equal value of securities.

Only when the government issues new money in exchange for assets of inadequate value will inflation result. If, for example, the government issues 100 new shillings, but uses them to buy new assets worth only 60 shillings, then this would put downward pressure on the value of the shilling. The recipient of those 100 shillings would eagerly accept them without being forced. Furthermore, the recipient of those shillings may or may not be forced to later part with them at a reduced value. The recipient would not voluntarily accept the shillings in the first place unless he was somehow compensated for any expected depreciation.

One way a currency can genuinely be forced into circulation is through the use of legal tender laws, which might force a merchant to sell goods worth 1 oz. in exchange for a paper shilling that would fetch only a fraction of an ounce in a free market. But of course if the government prints and spends a shilling, and receives assets worth more than a shilling in exchange, then the government's assets will rise relative to its liabilities, and the shilling will *rise* in value. In this case we could say that the backing for the shilling is the government's ability to rob its people. This ability is an asset of sorts, in the same way that a criminal's ability to shoot people must be counted as his asset.

In summary, the value of so-called forced currencies is determined by their backing, just like any other currency. And as with any currency, open channels of reflux are necessary to give currency-holders access to the assets backing that currency.

Conclusion

This essay develops an example of a monetary system in which the government issues paper money (shillings), while private banks issue checking account shillings that are based on those paper shillings. The paper shillings are backed by various government assets, including taxes receivable, coins, bonds, and loans. The checking account shillings are backed by the assets of the private banks that issued them, and these assets can also be of various types.

The example shows that both types of shillings have many channels through which they can reflux to their issuer, and each channel provides a form of convertibility. Open channels of reflux are necessary in order for people to have access to the assets backing the shillings, but not all channels need to be open at all times. For example, suspension of metallic convertibility closes one channel of reflux, but as long as enough alternate channels of reflux remain open to give people full access to the assets backing the shillings, the closing of the metallic convertibility channel does not affect the value of the shillings.

The suspension of metallic convertibility can create the illusion that a currency is no longer backed by the assets of its issuer, but is instead fiat money--money that is valued because of money supply and money demand, rather than because of backing. Believers in fiat money forget that under a suspension of metallic convertibility, other open reflux channels can still give currency-holders access to the assets backing the money. This observation implies that we have no reason to believe that modern government-issued moneys are fiat money. But there are at least two reasons to believe that there is no such thing as fiat money: (1) Fiat money creates a free lunch for its issuer. This would attract issuers of rival moneys, and this rivalry would reduce the demand for the so-called fiat money to the point where its value was zero. (2) There is no historical example of any government or bank that ever issued money (of positive value) without holding assets against that money and providing at least one channel of reflux to give the public access to those assets.

Checking account shillings are normally convertible into paper shillings, and as long as the issuing private bank is solvent, its checking account shillings will each be worth 1 paper shilling. Only if the private bank becomes insolvent would the value of its checking account shillings sink below par with paper shillings. Even in this case the law of reflux still operates, but checking account shillings will reflux to the bank in exchange for fewer paper shillings than before.

On quantity theory principles, the creation of checking account shillings would reduce the demand for paper shillings and thus reduce their value, but on backing theory principles, the creation of checking account shillings only causes some paper shillings to reflux to the government in exchange for equal-valued government assets. Thus the government's assets would fall in step with the quantity of paper shillings, so the value of a paper shilling is unaffected by the creation of checking account shillings.

The common view of the real bills doctrine says that any issuer of money, whether a government or private bank, should only issue money in exchange for short-term real bills of adequate value. Obeying this rule is said to prevent inflation by assuring that the quantity of money moves in step with the total quantity of goods. The backing theory says that issuers of money need only issue new money in exchange for assets of adequate value, regardless of whether those assets are short-term real bills. This prevents inflation, both for an individual bank and for the banking system, by assuring that the quantity of money moves in step with the assets backing it. As long as this is the case, it is not necessary for the quantity of money to move in step with the total quantity of goods.

The law of reflux is normally, and incorrectly, thought to prevent inflation by assuring that excess money automatically refluxes to the issuing bank. This assumes the correctness of the quantity theory view that the value of money is preserved by limiting its quantity. The backing theory view presented here asserts that the value of money is preserved by maintaining a constant amount of backing per unit of money, regardless of the total quantity of money. The law of reflux still operates, in the sense that unwanted money automatically refluxes to the issuing bank, but the main effect of the law of reflux is only to maintain the quantity of circulating money at a level

at which economic activity can be conducted conveniently.

The concept of a *forced* currency is a source of misunderstanding of the law of reflux. The belief that a so-called forced currency does not reflux to the government that issued it is incorrect, since currencies can reflux to governments in payment of taxes, purchases from the government, etc. If a currency really does have literally no open channel of reflux to the government, then that currency will have no value, since it provides no access to any government assets. Only when laws force people to accept currency from the government at an artificially high value can the currency be said to be forced, but in this case the government's assets will rise by more than enough to buy back the newly-created currency, and the effect of this would be to increase the value of the currency, not reduce it.

References

Blaug, Mark, *Economic Theory In Retrospect*, 3/e. Cambridge : Cambridge University Press, 1978

Davis, Andrew McFarland, *Colonial Currency Reprints*, Boston Prince Society, 1911.

Fullarton, John, *Regulation of Currencies of the Bank of England*, London: J. Murray, 1844.

David Glasner: The Real-Bills Doctrine in the Light of the Law of Reflux, *History of Political Economy* 1992, p867.

Knapp, George Friedrich, *The State Theory of Money*, Macmillan and Company, 1924.

Mankiw, Gregory, *Principles of Macroeconomics*, 2008, South-Western Cengage Learning.

Mints, Lloyd, *A History of Banking theory*, Chicago: University of Chicago Press, 1945, p. 89.

Arthur J. Rolnick Bruce D. Smith Warren E. Weber, "The Suffolk Bank and the Panic of 1837", *Federal Reserve Bank of Minneapolis Quarterly Review*, Vol. 24, No. 2, Spring 2000, pp. 3–13.

Skaggs, "John Fullarton's Law of Reflux and Central Bank Policy," *History of Political Economy* 23, Fall 1991.

Smith, Adam (1776) *An Inquiry into the Nature and Causes of the Wealth of Nations*, P. F. Collier, New York, 1909.

Sproul, Michael F., *There's No Such Thing as Fiat Money*, UCLA Working Paper #830, 2003.

Varian, Hal, "Why is that Dollar Bill in Your Pocket Worth Anything?", *New York Times*, January 15, 2004.