

THE REAL BILLS DOCTRINE

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... the real bills criterion sets no effective limit to the quantity of money.

Milton Friedman and Anna J. Schwartz
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With recession lingering and interest rates remaining high, one hears increasingly that the Fed should abandon its money growth targets and move to a policy of lowering interest rates to full employment levels. All would be well, we are told, if only the Fed would set a fixed low interest rate target consistent with full employment and then let the money stock adjust to money demand to achieve that desired target rate. In effect, this means that the Fed would relinquish control over the money stock, letting it expand as required in a vain effort to eliminate discrepancies between the market rate and the predetermined target rate.

This low target interest rate proposal has much in common with the long-discredited *real bills doctrine*, according to which the money supply should expand passively to accommodate the legitimate needs of trade. Both views contend that the money supply is (or should be) essentially demand determined. Both see causality as running from economic activity to money rather than vice versa. And, in their simplest versions at least, both treat the price level and its rate of change as predetermined exogenous variables and deny that inflation originates in the central bank. In fact, both views prescribe positive monetary expansion even in the face of inflation, the one to allow real transactions to take place at ever-rising prices, the other in an attempt to lower interest rates to target levels. In essence, both tie the money supply directly to an uncontrolled nominal variable that reflects inflationary pressures—the volume of eligible bills offered for discount in the case of the real bills doctrine and the nominal market rate-target rate differential in the case of the interest-pegging scheme. Finally, because they link the money stock to variables that tend to rise in step with prices, both generate inflationary feedback mechanisms in which prices and money chase each other upward indefinitely. In

these respects, at least, the interest-pegging proposal may be viewed as a recent variant of the old real bills doctrine.¹

The purpose of this article is to trace the origin and historical evolution of the real bills doctrine and to show how that doctrine survives today in the interest-targeting scheme. Before doing so, however, it is necessary to spell out the essential features of the doctrine and to identify its underlying error.

What is the Real Bills Doctrine?

Essentially, the real bills doctrine is a rule purporting to gear money to production via the short-term commercial bill of exchange, thereby ensuring that output generates its own means of purchase and money adapts passively to the legitimate needs of trade. The doctrine states that money can never be excessive when issued against short-term commercial bills arising from real transactions in goods and

¹ Thomas Sargent for one recognizes the essential similarity between the interest-pegging view and the real bills doctrine. Says he:

... it has often been argued that the proper function of the monetary authorities is to set the interest rate at some reasonable level, allowing the money supply to be whatever it must be to ensure that the demand for money at that interest rate is satisfied. Such a rule was actually written into the original act that established the Federal Reserve System in the U. S. The rule was known as the "real bills" doctrine. It was alleged that the quantity of money would automatically be properly regulated if the monetary authorities ensured that banks always had enough reserves to meet the demand for loans intended to finance "real" (as opposed to "speculative") investments at an interest rate set "with a view of accommodating commerce and business."

Thomas J. Sargent, *Macroeconomic Theory* (New York: Academic Press, 1979), p. 92. See also Lance Girton, who states that cheap-money, low-interest rate policies are "a close substitute for a real-bills money supply mechanism, and subject to the same defect." Lance Girton, "SDR Creation And The Real-Bills Doctrine," *Southern Economic Journal*, 41 (July 1974), 58, footnote 6.

services. More precisely, the doctrine contends that so long as banks lend only against sound, short-term commercial paper the money stock will be secured by and will automatically vary equiproportionally with real output such that the latter will be matched by just enough money to purchase it at existing prices.² In other words, inflationary overissue is impossible provided money is issued on loans made to finance real transactions.

² This conclusion—that a real-bills-based money stock will be just sufficient to purchase the economy's real output at existing prices—is derived as follows: First, define the needs of trade T as the value of inventories of working capital or goods-in-process G , the production of which must be financed by bank loans. Symbolically

$$(1) T = G.$$

Second, assume that each dollar's worth of goods-in-process G generates an equivalent quantity of paper claims in the form of commercial bills B which business borrowers offer as collateral behind their loan demands L_d . That is, assume that

$$(2) G = B \text{ and}$$

$$(3) B = L_d.$$

Third, observe that these loan demands L_d pass the real bills test (i.e., they are secured by claims to real goods) and therefore are accommodated by a matching supply of bank loans L_s as indicated by the expression

$$(4) L_d = L_s.$$

Fourth, note that since banks supply loans in the form of banknotes and/or demand deposits the sum of which comprises the money stock, the supply of loans L_s must equal the stock of money M_s ,

$$(5) L_s = M_s.$$

Substituting equations 1-4 into 5 and solving for the money stock yields

$$(6) M_s = T$$

which says that as long as banks lend only against short-term commercial bills arising out of transactions in real goods and services, the money stock will conform to the needs of trade. Since the needs of trade T and the value of goods-in-process G are identically equal one can also write

$$(7) M_s = G$$

which states that the money supply is ultimately secured by goods-in-process such that when those goods reach the market they will be matched by just enough money to purchase them at existing prices. This can be shown by defining the value of goods-in-process G as the multiplicative product of the price P and quantity Q of those goods, i.e.,

$$(8) G = PQ.$$

Substituting equation 8 into 7 yields

$$(9) M_s = PQ$$

which says that, assuming prices P given, the money stock M_s varies in step with real production Q . This is the essence of the real bills doctrine. Its error lies in treating prices as exogenous when in fact they are determined by the money stock itself.

Underwriting Inflation

The doctrine overlooks that the demand for loans depends not only upon the quantity of real transactions but also upon the level of prices at which those real transactions are effected. And rising prices would require an ever-growing volume of loans just to finance the same level of real transactions. Under the real bills criterion these loans would be granted and the stock of money would therefore expand. This monetary expansion would raise prices thereby requiring further monetary expansion leading to still higher prices and so on in a never-ending inflationary sequence. In this way, price inflation would induce the very monetary expansion necessary to perpetuate it and the real bills criterion would provide no effective limit to the quantity of money in existence. Here is the error of the real bills doctrine, namely the tendency to treat prices as given when in fact they vary directly with the money stock. Associated with this is the failure to perceive the two-way inflationary interaction between money and prices that results once money is allowed to be governed by the needs of trade.

Dynamic Instability

The preceding has identified the flaw in the doctrine as its failure to take account of the price-money-price feedback loop that renders the real bills mechanism dynamically unstable.³ As early as 1802

³ This dynamic instability can be illustrated by introducing a one-period time lag into the real bills money supply function (equation 9 of the preceding footnote) and adding the quantity theory equation of exchange to determine the current price level. Specifically, let the current period's money supply M be tied to last period's nominal national product QP_{-1} via the real bills money supply relationship

$$(1) M = aQP_{-1}$$

where a is the fixed ratio of money to lagged nominal national product and real output Q is assumed to be fixed at its constant full capacity level. Given real output this equation says that last period's price level P_{-1} determines this period's money stock. Next, assume that money determines prices contemporaneously via the equation of exchange

$$(2) P = (V/Q)M$$

where V is the constant circulation velocity or rate of turnover of money.

Lagging equation 2 one period, substituting it into equation 1, and solving the resulting first order difference equation for the time path of the money stock yields

$$(3) M = M_0(aV)^t$$

where t is time and M_0 is the arbitrary initial money stock. Similarly, the time path of the price level is given by the expression

Henry Thornton had already recognized this inherent instability. Real bills proponents, said he, "forgot that there might be no bounds to the demand for paper; that the increasing quantity would contribute to the rise [in the prices] of commodities: and the rise of commodities require, and seem to justify, a still further increase."⁴ More recently, Don Patinkin, referring to "the vicious cycle of inflation (or deflation) generated by a policy based on the real bills doctrine," identified the source of this instability:

For the essence of this doctrine [Patinkin says] is that the banking system should expand credit in accordance with the "legitimate needs of business"—where these "needs" are measured in money terms, and thus increase proportionately with the price level. [The result is] that any (say) upward price movement . . . will—in accordance with the "real bills doctrine"—generate an increased supply of money which will enable the movement to continue indefinitely.⁵

In other words, the doctrine ignores the fact that the needs of trade are measured in nominal terms that rise in step with prices. Since monetary expansion raises prices and rising prices, by expanding the needs of trade, are allowed to generate further increases in the money stock, the result is a vicious circle of inflation in which money and prices chase each other upward indefinitely. In short, because it ties the money supply to a nominal magnitude that moves in step with prices, the real bills doctrine provides no effective constraint on money or prices, both of which can rise without limit (see Box, pp. 6-7). Here is the fallacy of using one uncontrolled

$$(4) P = P_0(aV)^t$$

where P_0 is the arbitrary initial price level. Far from limiting prices and the money supply, equations 3 and 4 state that money and prices will either rise without limit or fall to zero with the passage of time depending upon whether the term enclosed by parentheses is greater than or less than unity. Only in the singular case in which the coefficient a is precisely equal to the reciprocal (inverse) of velocity will the money supply and the price level stabilize. But this case is unlikely to happen since a and V are determined by different factors. Specifically, a is determined by businessmen's desired inventory/output ratios, by the proportion of working capital financed by bank loans, and by the proportion of total bank loans made for working capital versus nonworking capital purposes. By contrast, velocity is determined by cash holders decisions regarding the fraction of income they wish to hold in the form of money balances. Because of this it is unlikely that the product aV will assume its money-stabilizing value of unity.

⁴ Henry Thornton, *Two Speeches of Henry Thornton, Esq. on the Bullion Report, May 1811*. Reprinted in *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain* (1802), ed. by F. A. v. Hayek (New York: Rinehart & Company, Inc., 1939), p. 342.

⁵ Don Patinkin, *Money, Interest, and Prices*, 2nd ed. (New York: Harper and Row, 1965), p. 309.

nominal variable (the money value of real transactions) to regulate another nominal variable (the money stock). This is the fundamental fallacy of the real bills doctrine.

Historical Origins: John Law

Having spelled out the real bills doctrine and identified its underlying error, the next step is to trace the evolution of the doctrine in the history of monetary thought. The concept of an output-governed currency secured by claims to real property and responding to the needs of trade has a long history dating back almost 280 years. The basic idea originated with John Law (1671-1729) who in his *Money and Trade Considered* (1705) proposed that the banknote issue be secured by and bear a fixed ratio to the market value of land. In arguing for a land-collateralized note issue, Law contended (1) that money's purchasing power ought to be stable, (2) that such purchasing power stability requires limiting the note issue to the real needs of trade, (3) that this limitation can be achieved by tying notes to the value of land (a proxy for the level of economic activity), and (4) that doing so provides an automatic check to overissue since notes cannot exceed the value of their collateral.⁶ Here is the origin of the idea that money cannot be inflationary if backed by sound productive assets.

Law's Error

To summarize, Law sought a criterion that would limit money expansion and ensure price stability. He thought that land's value provided such a criterion. Collateralized by land, money could never be over-issued since it would always be constrained by the value of the real property backing it. What he overlooked was that the market value of property contains a price component and that this price component is determined by the money supply itself. Since money determines the level of prices and the latter, through its influence on the value of land, is allowed to determine the size of the money stock, the result is a two-way inflationary interaction between money and prices in which both can rise without limit. That is, he failed to see that monetary expansion raises prices and that rising prices, by augmenting the nominal value of land, justifies further monetary

⁶ On Law see Lloyd W. Mints, *A History of Banking Theory* (Chicago: University of Chicago Press, 1945), pp. 15-16, 18, 20, 30-32 and Frank W. Fetter, *Development of British Monetary Orthodoxy 1797-1875* (Cambridge: Harvard University Press, 1965), pp. 7-9.

expansion leading to further price increases and so on in a cumulative inflationary sequence. In short, he erred in ignoring that

whereas convertibility into a given *physical amount* of specie (or any other economic good) will limit the quantity of notes that can be issued . . . the basing of notes on a given *money's worth* of any form of wealth—be it land or merchants' stocks—presents the possibility of an unlimited expansion of loans . . .⁷

Because of this, he failed to see that the money value of land provides no effective limit to the money stock or prices, both of which can expand indefinitely.⁸ Here is the origin of the basic fallacy of the real bills doctrine, namely the notion that one nominal variable (the money value of land) can be used to control the nominal money stock.

Adam Smith

If Law was the first to state that banknotes vary optimally when collateralized by the value of real property, then Adam Smith (1723-1790) was the first to contend that they do so when secured by

⁷ Mints, *History*, p. 30.

⁸ Law's error is easily demonstrated. Following him, let the note issue N be rigidly tied to the value of land V by the formula (rule)

$$(1) N = kV$$

where k is the fixed ratio of notes to the value of land. By definition, the total value of land is the multiplicative product of the fixed quantity of land L times the price per acre P_L , i.e.,

$$(2) V = LP_L$$

Now the price of land P_L is linked to the general price level P via the relative price relationship

$$(3) P_L = aP$$

where a is the relative price of land in terms of the general price level, as can be seen by rewriting the equation as $a = P_L/P$. Finally, assume that the price level P is a lagged function of the note issue $N-1$, i.e., money determines prices with a one-period lag. Symbolically,

$$(4) P = bN_{-1}$$

where b is the constant coefficient linking money to prices. Substituting equations 2-4 into 1 and solving the resulting difference equation for the time path of the note issue yields

$$(5) N = N_0[kLab]^t$$

where t is time and N_0 is the initial quantity of notes. Far from limiting the note issue, equation 5 says that the stock of notes will either rise without limit or fall to zero with the passage of time depending upon whether the bracketed term is greater than or less than unity. Note that since each component of the bracketed term is determined by different factors it is unlikely that the product of these components will assume its money-stabilizing value of unity.

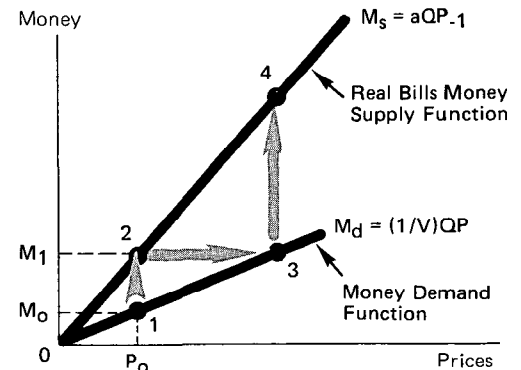
Box

Money and Price Level Instability in a Real Bills Regime

The following charts illustrate the inherent dynamic instability of the real bills money supply mechanism discussed in the text. Assuming real output constant, the charts plot money supply and money demand (equations 1 and 2 of footnote 3) as increasing linear functions of the price level. Money supply rises with prices because rising prices raise the nominal value of economic activity and thereby justify, via the real bills criterion, further increases in the money stock. Likewise, money demand also rises with prices because people need to hold more cash to purchase the constant quantity of real output at higher prices. The slopes of the two curves show the sensitivity or responsiveness of money supply and demand to price level changes. Since these sensitivities are determined by different sets of factors, it is unlikely that both curves will possess identical slopes. In particular, the price responsiveness of money supply is determined by such conditions as (1) businessmen's desired inventory/output ratios, (2) by the fraction of working capital financed by bank loans, and (3) by the proportion of total bank loans made for working capital purposes. By con-

Chart 1.

DYNAMIC INSTABILITY: Inflationary Case



This diagram depicts money supply and demand as linear functions of the price level. The slope of the money supply function exceeds that of money demand indicating that money supply responds more to a given price change than does money demand. Start with an initial money stock M_0 . This stock in conjunction with the demand for it determines a price level P_0 . Via the real bills mechanism, however, this price level justifies and generates a rise in the money stock to M_1 . This rise in the money stock raises prices which further raises the money stock, etc., in a cumulative inflationary sequence. We go from point 1 to point 2 to point 3 and so on ad infinitum. Money and prices expand without limit at a constant percentage rate $(M - M_{-1})/M_{-1} = (P - P_{-1})/P_{-1} = aV - 1$.

trast, the slope or price responsiveness of the money demand function is determined by the fraction of nominal income that people desire to hold in the form of cash balances—this fraction being the inverse of the circulation velocity of money. Only by accident would the slopes of the two curves be the same.

Chart 1 depicts the inflationary case in which money supply is more responsive to price level changes than is money demand, as indicated by the steeper slope of the money supply function. This case is characterized by a persistent (and growing) excess supply of money that continually bids up prices. Starting with an arbitrary initial money stock M_0 the chart traces out a monotonic explosive sequence of ever-rising money and prices showing that the real bills mechanism is incapable of limiting either variable.

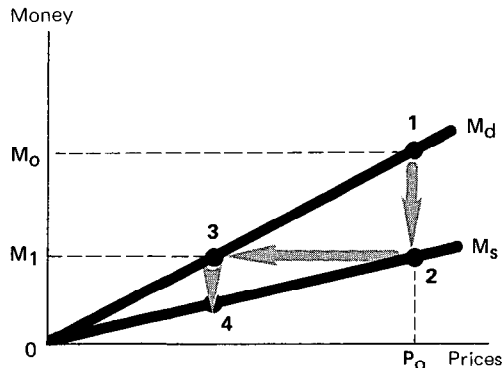
Chart 2 depicts the opposite case in which the real bills money supply function is less sensitive to price level changes than is money demand. This case is characterized by a persistent excess demand for money that causes

money and prices to fall to zero. Here is the potential for severe deflation inherent in the real bills mechanism.

Finally, Chart 3 depicts the special case in which money supply coincides with money demand at all price levels. In this particular case the real bills mechanism is said to be **indeterminate**, i.e., incapable of yielding a unique equilibrium solution for money and prices. It cannot yield a determinate solution because all points on the money supply/money demand curve represent equilibrium points. In this case, the mechanism determines only the ratio of money to prices but not those variables separately. To be sure, one can fix either money or prices from outside the mechanism, i.e., one can arbitrarily set money at M_0 or prices at P_0 . Doing so results in stability for both. But the mechanism itself is incapable of determining this solution. In short, Charts 1-3 indicate that the money stock and price level in a real bills regime are either dynamically unstable or indeterminate. Either way, the real bills criterion is incapable of limiting the money stock and for that reason alone constitutes a disastrous guide to policy.

Chart 2.

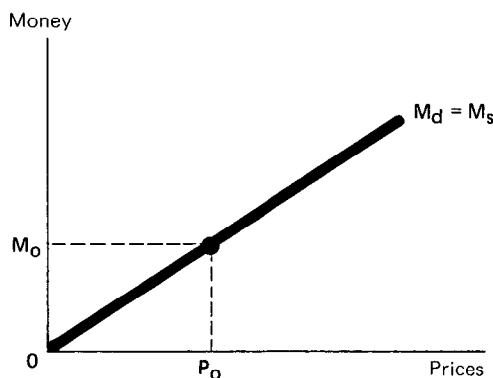
DYNAMIC INSTABILITY: Deflationary Case



Here the price responsiveness (slope) of the money supply function is less than that of money demand. The result is a persistent excess demand for money that exerts continuous deflationary pressure on prices and the money stock. An initial money stock of M_0 generates a price level of P_0 which, via the real bills mechanism, induces a drop in the money supply to M_1 which causes a further fall in the price level and so on in a deflationary spiral. We go from point 1 to point 2 to point 3 to point 4 and so on as money and prices chase each other downward to zero. Money and prices fall at a constant percentage rate of $\alpha V - 1$. Here is the potential for severe deflation in the real bills mechanism.

Chart 3

MONEY AND PRICE LEVEL INDETERMINACY



Here the real bills money supply function coincides with the money demand function. In this case the real bills mechanism itself is incapable of determining a unique equilibrium money stock and/or price level since all points on the demand and supply curve constitute equilibrium points. Of course one can arbitrarily determine the equilibrium money stock and/or price level from outside the model. For example, one can arbitrarily set money at M_0 and/or prices at P_0 . Doing this results in equilibrium for both variables. Note, however, that the real bills mechanism itself cannot yield a unique equilibrium M or P . They have to be determined outside the model.

short-term, self-liquidating bills of exchange. In so doing, he shifted the emphasis from land to commercial paper as the basis of the currency. Paper money, he wrote, varies optimally with the needs of trade when each bank "discounts to a merchant a real bill of exchange drawn by a real creditor upon a real debtor, and which, as soon as it becomes due, is really paid by that debtor."⁹ Here is the origin of the phrase "real bill" to denote short-term commercial paper arising from real transactions in goods and services. Smith's statement of it marks him as "the first thoroughgoing exponent of the real bills doctrine" in its modern form.¹⁰

While endorsing the doctrine, however, Smith managed to avoid some of its shortcomings. He realized, for example, that the real bills criterion by itself is not sufficient to prevent overissue. For that reason he advocated specie (i.e., gold) convertibility as the ultimate constraint on the quantity of paper money. That is, he held that banks should be required by law to convert their paper notes into specie at a fixed price upon demand. Constrained by the convertibility obligation, banks, he felt, would rarely overissue. In short, he viewed specie convertibility as the overriding check to overissue. In so doing, he avoided the error of supposing that the real bills criterion per se provides a sufficient limitation to the note issue regardless of the monetary regime.

He also avoided the dynamic instability or vicious circle problem that results from the two-way interaction between money and prices in the real bills mechanism. His version of the doctrine excludes the possibility of such inflationary interaction by explicitly breaking the transmission linkage running from money to prices. He severed that link by treating the price level as a predetermined exogenous variable that is invariant with respect to the note issue. More precisely, Smith argued that under specie convertibility the commodity price level is determined in world markets by the relative cost of producing gold and goods and then given exogenously to the open national economy. And with prices thus predetermined, it follows that they must be invariant with respect to the domestic note issue, i.e., paper money cannot affect prices in the small open economy. This breaks the vicious circle of inflation and money growth inherent in conventional versions of the real

bills doctrine and renders Smith's version immune to the problem of dynamic instability.¹¹

The Antibullionists (Early 1800s)

As previously mentioned, Adam Smith was astute enough to present the real bills doctrine within the context of a convertible currency regime in which specie convertibility limits the note issue and price-level exogeneity prevents it from generating inflation. Later, less astute writers incautiously extended the doctrine to the case of currency inconvertibility in which those safeguards are absent. Chief among these writers were the *antibullionists* who employed the doctrine to defend the Bank of England against the charge that it had taken advantage of the suspension of specie convertibility during the Napoleonic wars to overissue the currency.

The antibullionists adhered to the doctrine in its crudest, most uncompromising form. They argued that it provided a sufficient safeguard to overissue even under inconvertibility. That is, they argued that even an inconvertible paper currency could not be issued to excess as long as it was advanced only upon the discount of sound, short-term commercial bills. Two considerations, they said, ensured that a currency backed by real bills could never be over-supplied. First, being geared to real transactions, the quantity of currency could never exceed the real demand for it. More precisely,

bank paper issued against the genuine 'needs of trade'—that is against real security—could never become 'excessive.' Such issues could never be the active factor in any price rise because if they were the equivalent of real security they would only be meeting a demand for credit *which was already in existence*: hence—according to this view—bank credit met the needs of trade and did nothing to create those needs.¹²

In other words the supply of real product generates just enough money to purchase it at existing prices. Second, since no one would borrow at interest money not needed, banks could not force an excess issue on the market. Associated with this was the argument that if indeed the currency was temporarily excessive, the excess would immediately return to the banks to pay off costly loans. In short, interest-minimization considerations would ensure that any excess notes would quickly be retired from circulation.

⁹ Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776), (New York: Random House, 1937), p. 288.

¹⁰ Mints, *History*, p. 25.

¹¹ On this point see David Laidler, "Adam Smith as a Monetary Economist," *Canadian Journal of Economics* 14, no. 2, (May 1981) 196-97.

¹² B. A. Corry, *Money, Saving and Investment in English Economics 1800-1850* (New York: St. Martin's Press, 1962), p. 75.

The antibullionists used these arguments to defend the Bank of England against the charge that it had caused inflation. The Bank, they said, was blameless since it had restricted its issues to real bills of exchange and therefore had merely responded to the real needs of trade. That is, the Bank could not possibly be the source of inflation because, by limiting its advances to commercial paper representing actual output, it had merely responded to a demand for money already in existence and had done nothing to create that demand. Here is the origin of the notion that central banks cannot cause inflation since they merely supply money passively in response to a prior real demand for it. Besides this there was the argument that since no one would borrow at interest money not needed, the Bank could not force an excess issue on the market. Overlooked was the fact that the demand for loans depends not upon the loan interest rate itself but rather upon that rate relative to the expected rate of return on the use of the borrowed funds. If the latter rate exceeds the former, the demand for loans becomes insatiable and the real bills criterion presents no bar to overissue. This was a key point in Henry Thornton's criticism of the real bills doctrine.

Henry Thornton's Criticisms

If the antibullionists were the strongest proponents of the real bills doctrine then Henry Thornton (1760-1815), the British banker, monetary theorist, and long-time member of Parliament, was by far its ablest and most penetrating critic. His devastating critique of the doctrine remains unsurpassed to this very day. In his parliamentary speeches and his classic *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain* (1802) he flatly denied that the real bills criterion can effectively limit the note issue. Indeed, he went out of his way to denounce "the error . . . of imagining that a proper limitation of bank notes may be sufficiently secured by attending merely to the nature of the security for which they are given."¹³ He then proceeded to attack the doctrine on at least three grounds.

First, he contended that the volume of eligible bills coming forward for discount depends not only upon the quantity of goods produced, but also upon the rate of turnover of those goods and the period of credit or length of time that bills have to run. Goods, he pointed out, may be sold a number of times, each sale giving rise to a real bill. Also, the period for which a

given bill is customarily drawn may exceed the turnover period of goods. Thus, depending upon the number of transactions between merchants in bringing goods to market and the period of credit, any number of bills can be generated upon the alleged security of the same goods. For example,

Suppose that A sells one [dollar's] worth of goods to B at six months credit, and takes a bill at six months for it; and that B, within a month after, sells the same goods, at a like credit, to C, taking a like bill; and again, that C, after another month, sells them to D, taking a like bill, and so on.¹⁴

At the end of six months, \$6 of bills, all eligible for discount, would be outstanding even though only \$1 worth of goods had been produced. And if the length of credit (maturity of each bill) were 12 rather than 6 months, then \$12 of bills could be issued on the security of the original \$1 worth of goods. In general, the volume of bills outstanding will be

$$(1) B = mGt$$

where B is the volume of bills, m their maturity, G the nominal stock of goods, and t its annual turnover rate. Extension either of the maturity of bills or of the turnover rate of goods would, Thornton claimed, result in "the greatest imaginable multiplication" of bills on the basis of a given quantum of goods.¹⁵ Because of this, the quantity of money issued against real bills would far exceed the needs of trade.

Second, Thornton argued that the doctrine fails to perceive that monetary expansion raises prices and that rising prices, by expanding the needs of trade, generate further inflationary increases in the quantity of money. The result is a vicious circle of inflation in which money and prices chase each other upward indefinitely. Because it links the money supply to a nominal magnitude that moves in step with prices, the real bills doctrine provides no constraint on prices or the quantity of money, both of which can rise without limit. The fallacy of the real bills doctrine, said Thornton, is that it "considered security as every thing and quantity as nothing." Its proponents

forgot that there might be no bounds to the demand for paper; that the increasing quantity would contribute to the rise of commodities: and the rise of commodities require, and seem to justify, a still further increase.¹⁶

¹³ Thornton, *Paper Credit*, p. 244.

¹⁴ Thornton, *Paper Credit*, p. 86.

¹⁵ Thornton, *Paper Credit*, p. 253.

¹⁶ Thornton, *Paper Credit*, p. 342.

Here is the classic statement of the inherent dynamic instability of the real bills mechanism.

Finally, Thornton argued that the supply of eligible bills becomes inexhaustible and the corresponding demand for loans insatiable when the loan rate of interest is pegged below the expected rate of profit on new capital investment. He explained in great detail how such a rate differential, by making borrowing profitable, would set in motion a process of cumulative expansion of bills, loans, money, and prices. This expansion, he said, would persist as long as the loan rate remained below the expected profit rate. Given the interest rate differential, money and prices would rise without limit and the real bills criterion would fail to provide the needed constraint. He reached this conclusion via the following route. He argued, first, that the demand for new loans depends primarily upon the profit rate-loan rate differential.¹⁷ Secondly, assuming that new loan demands are accommodated via corresponding increases in the note issue, and that the increased note issue is spent on the fixed full capacity level of real output thereby raising prices equiproportionally with the money stock, it follows that money and prices also rise in proportion to the interest rate differential, growing without limit as that differential persists.¹⁸

¹⁷ "In order to ascertain how far the desire of obtaining loans at the bank may be expected at any time to be carried [he writes], we must enquire into the subject of the quantum of profit likely to be derived from borrowing there under the existing circumstances. This is to be judged of by considering two points: the amount, first of interest to be paid on the sum borrowed; and, secondly, of the mercantile or other gain to be obtained by the employment of the borrowed capital We may, therefore, consider this question as turning principally on a comparison of the rate of interest taken at the bank with the current rate of mercantile profit." Thornton, *Paper Credit*, pp. 253-54.

¹⁸ To demonstrate how Thornton reached this conclusion, consider the simplest possible version of his model. First, suppose that business loan demands L_d expand in proportion to the profit rate-loan rate differential $(\bar{R}-R)$ according to the expression

$$(1) \dot{L}_d = a(\bar{R}-R)$$

where the dot over the loan demand variable denotes the rate of change (time derivative) of that variable and a is the coefficient linking new loan demands to the profit rate-interest rate differential. Second, assume that the new loan demands are backed by a corresponding expansion in the volume of eligible bills B offered for discount. Because these bills pass the real bills test, the new loan demands are accommodated via an equivalent expansion in the money stock M_s . In symbols,

$$(2) \dot{L}_d = \dot{B} = \dot{M}_s$$

where L_d denotes loan demand, B the volume of bills, M_s the money stock, and the dots denote the rates of change (time derivative) of the attached variables. Third, suppose that prices P rise in proportion to rises in the money stock according to the equation

In this connection, Thornton stressed that the interest differential, if maintained indefinitely, produces a *continuous* and not merely a *one-time* rise in money and prices. This is so, he said, because as long as the differential persists, borrowing will continue to be profitable even at successively higher price levels. The result will be more borrowing, more lending, more monetary expansion, still higher prices and so on ad infinitum in a cumulative inflationary spiral. Here, almost 100 years before Knut Wicksell himself expressed it, is the essence of the Wicksellian cumulative process.

On the basis of the foregoing analysis, Thornton drew several conclusions regarding the validity of the real bills doctrine. First, the real bills constraint is ineffective in the face of a positive profit rate-loan rate differential. For as long as the differential persists and credit rationing is not applied, money, prices, and the volume of eligible bills will expand without limit on the basis of a fixed amount of real property. In short, given the rate differential, the real bills doctrine provides no bar to overissue. Second, the ineffectiveness of the real bills constraint renders invalid the notion that it is safe to allow the money supply to adapt itself automatically to the needs of trade. Said Thornton,

Any supposition that it would be safe to permit the bank paper to limit itself, because this would be to take the more *natural* course, is, therefore, altogether erroneous. It implies that there is no occasion to advert to the rate of interest in consideration of which the bank paper is furnished, or to change that rate according to the varying circumstances of the country.¹⁹

To summarize, in Thornton's view the real bills constraint offered no effective limit on the money supply. To achieve monetary stability, other constraints (e.g., convertibility, a loan rate equal to the profit rate or, alternatively, direct credit rationing) were required.

$$(3) \dot{P} = k\dot{M}_s$$

where P denotes prices, M_s denotes the money stock, the dots denote the rates of rise (time derivatives) of those variables, and k denotes the proportional relationship between inflation and money growth. Substituting equation 1 into equations 2 and 3 yields

$$(4) \dot{L}_d = \dot{B} = \dot{M}_s = a(\bar{R}-R) \text{ and}$$

$$(5) \dot{P} = ka(\bar{R}-R).$$

These equations identify the profit rate-loan rate differential as the ultimate cause of the rise in loan demand, loan supply, eligible bills, money stock, and price level—all of which expand without limit as long as the differential persists.

¹⁹ Thornton, *Paper Credit*, p. 254.

The Doctrine After Thornton

Thornton was not alone in condemning the real bills doctrine. Among his contemporaries, Lord King, for example, contended that when the commercial profit rate exceeds the loan rate of interest the demand for loans and corresponding offer of eligible bills "may be carried to any assignable extent."²⁰ David Ricardo (1772-1823) likewise stated that when the Bank of England charges less than the going rate of profit "there is no amount of money which they might not lend."²¹ He also denied that the needs of trade could effectively limit the note issue since, via the resulting rise in prices, commerce could absorb any conceivable quantity of notes.

Despite these criticisms, the real bills doctrine survived in 19th and 20th century banking tradition thus "scoring high on the list of 'longest-lived economic fallacies of all times'."²² Renamed the *Principle of Reflux* (according to which overissue is impossible since any excess notes will be returned immediately to the banks to repay loans), it reappeared in the Currency School-Banking School controversy that took place in England in the middle decades of the 19th century. In particular, Banking School writers Thomas Tooke and John Fullerton used it "to refute the alleged necessity of any regulation of the note issue other than the obligation of convertibility; and to this end they sought to establish that so long as notes were issued on good security and were ultimately convertible there was no danger of overissue."²³

In the late 19th and early 20th centuries the doctrine reappeared in the United States where it formed the theoretical mainstay of such proponents of banking reform as Charles A. Conant, A. Barton Hepburn, J. Laurence Laughlin, William A. Scott, Horace White, and H. Parker Willis—all of whom believed that the currency should be based upon

commercial paper arising from real transactions.²⁴ The doctrine was attacked in 1905 by A. Piatt Andrew who pointed to the two-way inflationary interaction between money and prices inherent in the real bills mechanism. Said Andrew of this inflationary feedback loop running from money to prices and prices to money:

every new extension of credit, though based upon the money value of goods, would tend to raise the price level, and each elevation of the price level in its turn would justify a further extension of credit. The two movements might continue pursuing each other until eternity and yet the aggregate value of the means of payment would not become co-extensive with the money value of all property. The alleged limitation of bank credit by 'the value of goods and property owned by borrowers' is from every point of view delusive. It is not only untrue; it is impossible.²⁵

In other words, the real bills doctrine embodies an inflationary transmission mechanism running from money to prices to the level of economic activity or needs of trade (a nominal magnitude that rises in step with prices) and back again to money in a never-ending, explosive sequence. In short, because it cannot distinguish between the price and output components of economic activity, the real bills criterion constitutes no bar to the inflationary overissue of money.

Andrew's criticism notwithstanding, the doctrine was enshrined as a key concept in the Federal Reserve Act of 1913. The Act provided for the extension of reserve bank credit (chiefly loans to member banks) via the Federal Reserve's rediscounting of eligible (short-term, self-liquidating) commercial paper presented to it by member banks. As if to underscore its allegiance to the doctrine, the Federal Reserve Board in its famous *Tenth Annual Report* for 1923 stated that "It is the belief of the Board that there is little danger that the credit created and distributed by the Federal Reserve Banks will be in excessive volume if restricted to productive uses." And in its ruling as to the kinds of eligible paper that member banks could present for rediscount, the Board showed that by "productive uses" it meant loans to finance the production and marketing of actual goods.

²⁰ Lord King, *Thoughts on the Effects of the Bank Restrictions*, 2nd ed., 1804, p. 22. Quoted in Jacob Viner, *Studies in the Theory of International Trade* (New York: Augustus Kelley, 1965), p. 149.

²¹ David Ricardo, *Principles of Political Economy and Taxation*, 3rd ed. [1821], quoted in Viner, *Studies*, p. 150.

²² Mark Blaug, *Economic Theory in Retrospect*, 3rd ed., (Cambridge: Cambridge University Press), p. 56.

²³ Lord Robbins, *The Theory of Economic Development in the History of Economic Thought* (New York: St. Martin's Press, 1968), p. 141.

²⁴ Mints, *History*, pp. 206-7, footnote 33. See also Robert Craig West, *Banking Reform and the Federal Reserve, 1863-1923* (Ithaca, N. Y., Cornell University Press, 1977), Chap. 7.

²⁵ "Credit and the Value of Money." *Publications of the American Economic Association*, VI (3d. ser., 1905), 111.

Finally, the real bills doctrine was the basis of the Reichsbank's policy of issuing astronomical sums of money to satisfy the needs of trade at ever-rising prices during the German hyperinflation of 1922-1923. Oblivious of Thornton's demonstration that the real bills criterion is no bar to inflationary over-issue when the borrowing rate is pegged below the going profit rate, the Reichsbank insisted on pegging its discount rate at a level no higher than 90 percent at a time when the going market rate of interest was in excess of 7000 percent per annum. This huge interest differential of course made it extremely profitable for banks to rediscount bills with the Reichsbank and to loan out the proceeds, thereby producing additional inflationary expansions of the money supply and further upward pressure on interest rates. If the authorities recognized this, however, they did nothing to stop it. On the contrary, throughout the hyperinflation episode the Reichsbank's president, Rudolf Havenstein, considered it his duty to supply the growing sums of money required to conduct real transactions at skyrocketing prices. Citing the real bills doctrine, he refused to believe that issuing money in favor of businessmen against genuine commercial bills could have an inflationary effect. He simply failed to understand that linking the money supply to a nominal variable that moves in step with prices is tantamount to creating an engine of inflation. That is, he succumbed to the fallacy of using one uncontrolled nominal variable (the money value of economic activity) to regulate another nominal variable (the money stock).

Survival of the Real Bills Fallacy in the Interest-Pegging Scheme

The foregoing fallacy survives today in the notion that the Federal Reserve should use easy monetary policy to lower interest rates to target levels consistent with full employment. For just as the real bills doctrine calls for expanding the money stock with rises in the needs of trade, so does the interest-targeting proposal call for increasing the money supply when the market rate of interest rises above its target level—this monetary expansion continuing until the rate disparity is eliminated. Here again is the fallacy of using one uncontrolled nominal variable (the market rate-target rate differential) as a guide to regulating the nominal money stock.

Moreover, tying the money stock to the market rate-target rate differential produces the same inflationary feedback of prices to money and money to prices that characterizes the real bills mechanism. For the more the Fed expands the money supply in a vain effort to get interest rates down, the greater the inflationary pressure it puts on those rates. And the more those rates rise, the greater the monetary expansion required to temporarily lower them. Thus the attempt to peg interest rates generates a dynamically unstable process in which money and prices chase each other upward ad infinitum in a cumulative inflationary spiral. Like the real bills criterion, the interest-pegging scheme provides no effective constraint on money or prices, both of which rise without limit. Because of this the interest-targeting proposal may be viewed as merely the latest reincarnation of the discredited real bills fallacy.

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