

INTERNATIONAL FINANCE DISCUSSION PAPERS

SDR CREATION AND THE REAL-BILLS DOCTRINE

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Discussion Paper No. 18, October 24, 1972

Division of International Finance

Board of Governors of the Federal Reserve System

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SDR Creation and the Real-Bills Doctrine*

"A Growth rate (of SDR's) approximately half that of world trade might be an appropriate target."^{1/}

The insights gained from the long and detailed study of domestic monetary problems are not always carried over to the study and design of international monetary systems. Some of the proposals for the creation of international fiat reserve money (e.g., SDR's) would, if implemented, introduce an avoidable instability into the international economy. This instability results from a mechanism logically identical to that exhibited in a domestic banking system run according to the real-bills doctrine.

The Real Bills Doctrine

The real-bills doctrine goes at least as far back as Adam Smith (Book II, Chapter II, esp. pp. 288-291). The doctrine was extensively dealt with by Mints in his History of Banking Theories.

The real-bills doctrine runs to the effect that restriction of bank earning assets to real bills of exchange will automatically limit, in the most desirable manner, the quantity of bank liabilities; it will cause them to vary in quantity in accordance with the needs of business. (Mints, p. 29)

Mints points out the error in the real-bills doctrine.

The fundamental error...lay in the fact that...whereas convertibility into a given physical amount of species (or any other economic good) will limit the quantity of notes that can be issued, although not to any precise and foreseeable extent (and therefore not acceptably), the basing of notes on a given money's worth of any form of wealth--be it land or merchant's stock--presents the possibility of unlimited expansion of loans, provided only that the eligible goods are not unduly limited in aggregate value. (Mints, p. 30)

*I have benefited from discussions with Michael Dooley, Dale Henderson, and Don Roper on different points raised in this paper. The opinions expressed in this paper are the author's and cannot be taken as representative of the views of anyone else in the Federal Reserve System.

^{1/} Laurence B. Krause, "Sequel to Bretton Woods." P. 38.

The real-bills doctrine is theory of the proper money supply mechanism. The instability argument leveled against the real-bills doctrine must be made in the context of a complete model. To illustrate the nature of the instability introduced by use of a real-bills type money supply mechanism, a simple quantity theory model is used here.^{1/}

1) $M^s = \bar{M} + a_1 D$, where M^s is the supply of money, \bar{M} and a_1 ($a_1 > 0$) are constants, and D is the total dollar value of discountable real-bills.^{2/} The dollar value of real-bills is assumed to be positively related to money national income (Y):

2) $D = a_2 Y$.

Substituting the bills-income relationship into the money supply function then,

3) $M^s = \bar{M} + a_1 a_2 Y$.

The demand for money is assumed to be

4) $M^d = kY$.

If it is assumed that income adjusts as

5) $\frac{dY}{dt} = \gamma(M^s - M^d)$, $\gamma > 0$, then the stability condition for the system can be derived by examining

6) $\frac{dY}{dt} = \gamma(\bar{M} + a_1 a_2 Y - kY)$.

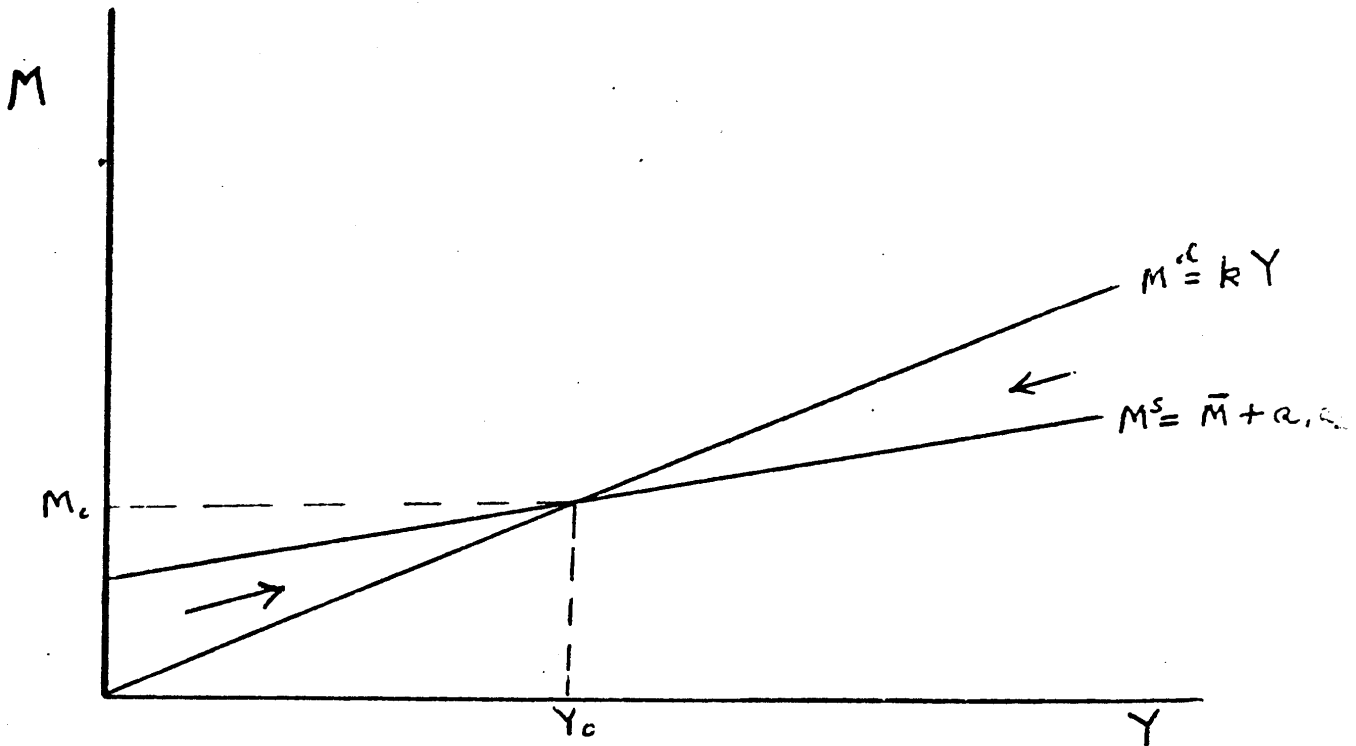
1/ Throughout simple linear functions are used. Non-linear functions may introduce multiple equilibria. In that case the condition for local stability is the same as set out here.

2/ The term "real" as used in this context does not indicate a price deflated magnitude but rather indicates that the debt instruments denoted arise from trade in "real" goods. According to Smith (p. 288) "...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...".

for the system to be stable the characteristic root of equation (6) must be negative,

$$7) \lambda = \gamma(a_1 a_2 - k) < 0.$$

The system is stable if the partial effect of a change in income on the demand for money exceeds the partial effect of an income change on the supply of money.^{1/} The stability condition can be seen graphically by looking at the figure below. The $M^d = kY$ and $M^s = \bar{M} + a_1 a_2 Y$ curves are drawn for the stable case.



If $a_1 a_2 < k$ then the system will be stable, given the dynamic postulate

$\frac{dY}{dt} = \gamma(M^s - M^d)$. If $a_1 a_2 > k$ the system will be unstable regardless of the value of \bar{M} .

^{1/} This is a generalization of Mints' results. Mints, apparently, always assumed that \bar{M} was zero, which led him to the conclusion that a system with the supply of money determined in accordance with the real-bills doctrine would be either in metastable equilibrium or unstable. See Mints pp. 30-34.

In the unstable case (where the responsiveness of the demand for money is less than the responsiveness of the supply of money, to an income change) an increase in nominal income will lead to an excess supply of money. The excess supply of money will cause income to rise as people increase expenditures in attempts to draw down money balances. This induced rise in income will generate an increased excess supply of money--ad nauseam.

Implication for the Creation of SDR's

While the inappropriateness of determining the domestic money supply in accordance with the real-bills doctrine has been realized for some time, the same apprehension has not been carried over into the design of international monetary systems. The real bills doctrine is potentially more pernicious if followed by a world monetary authority than if followed by an individual country since, at least in the 19th century, the latter was constrained by convertability into a physical commodity at a fixed price, while the former may face no such constraint.

The famous Keynes. Plan for reforming the international monetary system, for instance, seems to have a real-bills doctrine type determination of the supply of international reserves. The following quote is suggestive.

Subsequently, after the elapse of the transitional period, the quotas should be revised annually in accordance with the running average of each country's actual volume of trade in the three preceding years, rising to a five-year average when figures for the five post-war years are available. The determination of a country's quota primarily by reference to the value of its foreign trade seems to offer the criterion most relevant to a plan which is chiefly concerned with the regulation of the foreign exchanges and of a country's international trade balance. It is, however, a matter for discussion whether the formula for fixing quotas should also take account of other factors.^{1/}

^{1/} This is taken from provision 5 of the plan. See Proceedings and Documents of United Nations Monetary and Financial Conference Vol. II p. 1554.

One can see the essential similarity between an international monetary system where increases in world reserves (SDR's) are determined by the nominal value of world trade, and a domestic monetary system run according to the real-bills doctrine, by the following argument. Let the nominal supply of international reserves (R^S) be a function of the nominal value of world trade (T),

$$8) R^S = \bar{R} + a_1 T, \text{ where } \bar{R} \text{ and } a_1' \text{ (} a_1' > 0 \text{) are constants.}$$

The level of international trade is assumed to be positively related to the level of world income (Y^*),

$$9) T = a_2' Y^*.$$

Substituting the trade-income relationship into the reserve supply relationship, then

$$10) R^S = \bar{R} + a_1' a_2' Y^*.$$

If the variance of trade imbalances is positively related to the level of trade then the level of trade should be an important factor in determining desired reserve holdings (R^d).^{1/} Income may also enter the demand function through a wealth effect.

$$11) R^d = R(T, Y^*) = k' Y^*, \text{ } k' > 0.$$

^{1/} There have been a number of theoretical and empirical studies of the demand for international reserves. The idea that the demand for international reserves is closely related to the level of trade has been discussed by numerous authors. Various other variables are also thought to influence the demand for reserves: the level and variability of liquid liabilities to foreigners, the level of the domestic money supply, and interest rates, to mention a few. I ignore factors other than those related to the level of income. For a recent discussion of the demand for international reserves see the papers included in the AER Papers and Proceedings, published May, 1968.

If domestic authorities tend to pursue expansionary policies when actual reserve holdings are above desired holdings and contractionary policies when actual reserves are below desired holdings, then nominal world income (Y^*) will tend to move according to the gap between actual and desired reserves,

$$12) \frac{dY^*}{dt} = Y' (R^s - R^d) \frac{1}{\lambda'}$$

Substituting equations (10) and (11) into equation (12) and expanding in a Taylor series around equilibrium, the characteristic equation obtained is:

13) $0 = [Y' (a'_1 a'_2 - k') - \lambda'] (Y^* - Y^*_0)$, where Y^*_0 is the equilibrium value of world income. The stability condition ($\lambda' < 0$) is that the partial effect of a change in world income on the demand for reserves must exceed the partial effect of a change in world income on the supply of reserves ($k' > a'_1 a'_2$). The larger is the responsiveness of the supply of reserves to the nominal value of trade (a'_1) the more likely it is the system will

1/ This dynamic adjustment equation is probably over simplified. Domestic authorities probably look at several targets, at least in determining short-run policies. Also, the distribution of reserve disequilibrium among countries may be important. However, for the problem dealt with here, i.e., to point out an instability that can arise from the reserve supply mechanism, this equation may adequately capture reality.

The authors of the Fund's study International Reserves and Liquidity observe that most industrial countries

appear to have tried to achieve reserve ratio's (reserves to imports) between 30 and 50 per cent, or perhaps 40 and 50 per cent, in the sense that if reserves were below these levels they tried to increase reserves and if reserves rose beyond some such level they tried to adopt a more expansionary policy. (p.48)

For a detailed examination of the adjustment behavior of several major countries in the post-war period see Michaely, The Responsiveness of Demand Policies to Balance of Payments.

be unstable. If $a'_1 a'_2 > k'$ then an increase in world income will lead to a larger increase in the supply of reserves than in the demand for reserves. Countries will pursue on balance expansionary policies driving up trade and nominal world income farther. Increases in world income and reserves will follow each other without limit. If the initial shock in income is negative then the reserve supply mechanism will lead toward a shrinking of work trade and income.

It is at first surprising that though the fallaciousness of the real-bills doctrine as applied to a domestic monetary system is now generally accepted, and has been for some time,^{1/} little or no attention has been paid to the problem when dealing with the design of an international monetary system. There are undoubtedly several reasons for this hiatus.

The reason that perhaps first comes to mind is that one may accept the stability of the demand for domestic money and reject the relevance of any such notion applied to international money. One may accept the proposition that the demand for domestic money is closely related to income and that divergences between desired money balances and actual money balances lead people to alter their behavior so as to put pressure on income fairly quickly. Central banks demand for reserves, on the other hand, may not be so clearly defined, at least over a broad range. Even if they have clearly defined demands for reserves the authorities may show reluctance to act or be capricious in their choice of the policies pursued to alter reserve holdings. While this view is not easy to disprove using available evidence, I do not think that it is widely held by those people that spend much time on thinking about the proper design of an international monetary system. The design of an international reserve creation mechanism is worthy of attention only if the demand for reserves is fairly stable.

^{1/} Mints' well-known work was published in 1944.

There is an alternative explanation for the lack of concern with the real-bills problem by those that think that about international monetary reform, that fits in with the treatment of domestic monetary theory. After the 1930's and the "Keynesian revolution" the main stream of macro-economic theorist rejected the hypothesis that a simple process governed income changes. Price movements were taken to be determined by a multitude of factors, including institutional factors, and largely unrelated to current demand pressures, except at full-employment. If under-employment is taken to be the major problem and the normal state of the economy, then shocks and induced changes in nominal income will be reflected in real income changes. Adjusting the money supply to meet the needs of trade is not such an absurd proposition as long as income is increasing and there is excess capacity in the economy.^{1/}

If this view of the world is carried over into the design of an international monetary system then it is not surprising that little attention is devoted to the real-bills problem. As long as world trade and income are expanding and major trading countries have underemployment and excess capacity then supplying reserves so as to meet the needs of trade might not seem unsound to those that take a Keynesian view of the determinates of price changes. Presumably though, no one would argue that reserves should be reduced in the event of a world recession, though this problem seems not to have been given any attention.

^{1/} I hope to deal further with the modern history of the real-bills doctrine in a later paper, where the relationship between interest rate policies and the real-bills doctrine will be examined.

While the relating of the supply of reserves to the nominal value of world trade or income may not become an explicit part of the SDR creation mechanism, it is not unlikely that the value of world trade will in fact become a primary determining factor of increases in SDR's if other criteria for the rate of creation of SDR's are not explicitly agree to.^{1/}

In Triffin's discussion of his plan for a world central bank much time is spend on the measure of reserve adequacy and on how a central bank should operate so as to keep international reserves at an adequate level.^{2/}

The ratio of gross reserves to annual imports will be retained in all that follows as a first, and admittedly rough approach to the appraisal of reserve adequacy...this ratio is the one that has been most popularized in all postwar discussions of the subject, and that monetary authorities in many countries are apt to think today of reserve adequacy in these terms, and to act accordingly. (Triffin p. 36)

Triffin then devotes a large part of his work to a discussion of the level of reserve growth needed to keep reserves at an adequate level.

The thrust of Triffin's analysis is that one should increase reserves to meet the needs of trade, i.e., keep reserve to import ratios at adequate levels, even if the increase in the value of imports is caused by price increases.

It might also be noted that all these calculations with reference to an assumed rate of physical growth leave aside the impact of price rises upon liquidity requirements. This is, of course, reasonable insofar as one should not plan to increase international liquidity in such a way as to facilitate or stimulate inflationary price increases. Yet, if such increases are not avoided in fact by the major trading countries, corresponding liquidity adaptations might be preferable to alternative adjustments such as gold revaluation or certainly, a tightening of trade or exchange restrictions. (p. 49)

^{1/} Note the introductory quote.

^{2/} The following quotes are taken from Triffin's, Gold and the Dollar Crisis.

Instead of following the analysis through, Triffin suggests that a maximum increase in reserves of from 3 to 5 per cent a year would be a good simple rule -- avoiding the real-bills fallacy at the cost of an inconsistency in his position. He does not face up to the problem of the proper policy if price increases are causing trade flows to increase so that reserve to import ratios are falling below adequate levels. If price increases are independent of the supply of reserves, but inadequate reserves stifle real trade and growth, then the maximum growth rule should be violated -- supply reserves to meet the needs of trade.^{1/} If on the other hand one believes that price increases are related to the rate of increase in world reserves, in a manner like that set out earlier, then if reserves are increased to keep reserve to import ratios at "adequate" levels, a dynamic instability is introduced into the system.

Since the Triffin plan was first set out, economists have become much more concerned with problems of inflation. In the current environment one should be reluctant to set out a plan for increasing SDR's that could contribute to spiraling world inflation by tying increases in reserve to the nominal value of world trade.^{2/}

1/ The position is consistent with the "Keynesian" view set out earlier.

2/ One also might be a little concerned about how the managers of a world central bank bank founded on the principle of increasing reserves to meet the needs of trade, would react to a world wide recession. Would they allow world reserves to decline?

Many factors have been neglected in the analysis, in particular, interest rates. Also, perhaps the stability of the demand for international reserves and the constancy and strength of adjustment behavior have been overdrawn. However, it would be difficult to set out a realistic analytical framework where the relating of reserves to the nominal value of trade would not be pernicious for the reason given here.

A reasonable and unambitious approach, given the state of knowledge and the ability for countries to agree, would be to decide on a steady rate of increase in world reserves. The steady rate of growth in reserves decided on should take into account anticipated long-run growth in real trade and income and any long-run trends in prices that are thought necessary or unavoidable. The rate of change in reserves could be altered as the underlying long-run trends in the world economy change, but any link between short-run changes in the demand for reserves and reserves supplied should be explicitly denied. Reserves should not be supplied to meet the short-run needs of trade, to do so would be destabilizing, but be supplied to meet the long-run needs of the world economy.

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