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INTERNATIONAL MONEY AND
THE FUTURE OF THE SDR

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INTERNATIONAL FINANCE SECTION

DEPARTMENT OF ECONOMICS

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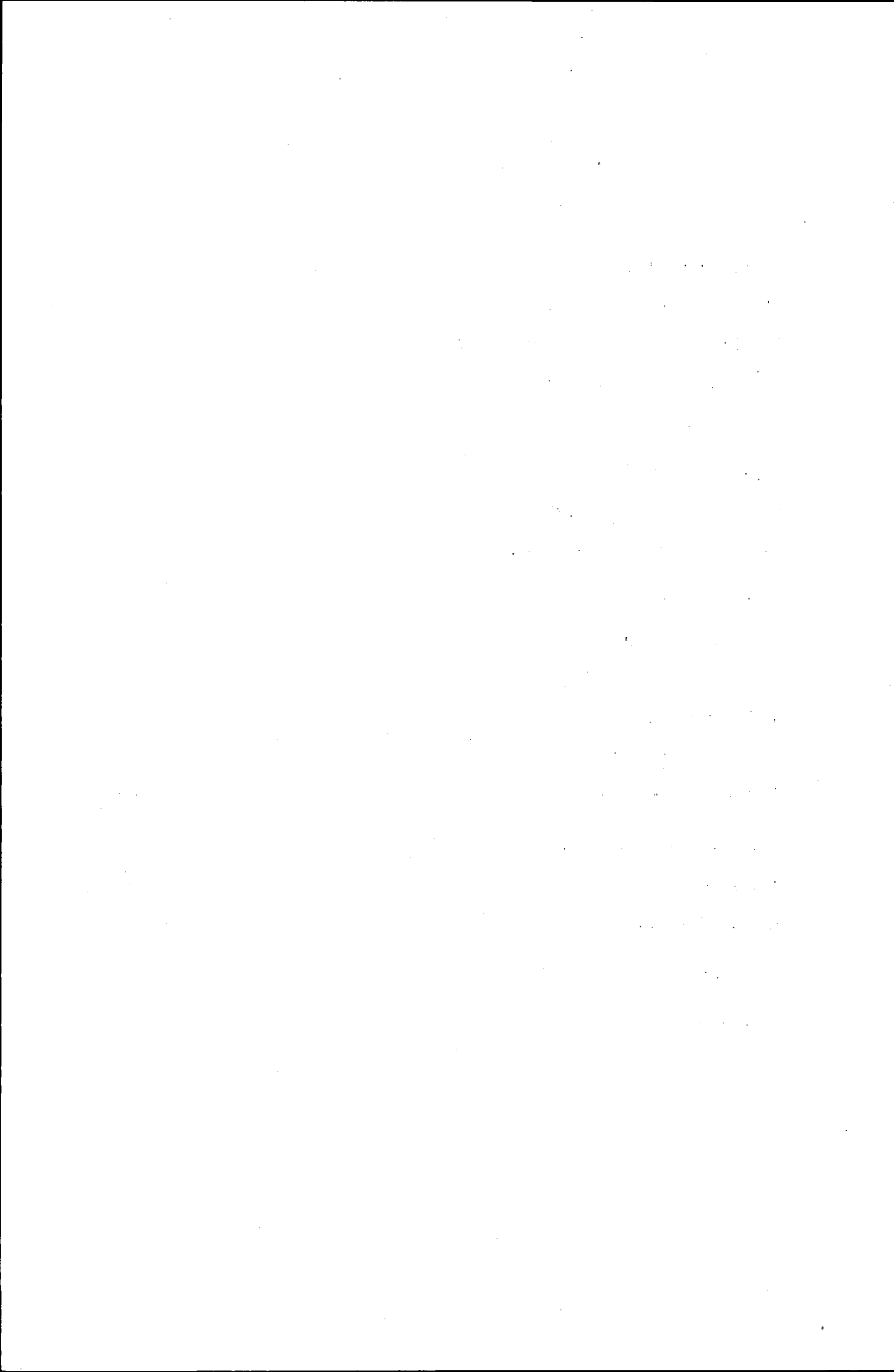
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International Money and the Future of the SDR

Introduction

The aim of this Essay is to develop a particular view of the international monetary system as a whole and to draw some implications for the future of Special Drawing Rights. The approach I employ is a logical extension of ideas to be found in monetary theory, but the emphasis is rather different from that found in the international monetary literature of the last three decades. There, the overwhelming weight of attention has been directed at the official sector and especially at official reserves and intervention policies. From that standpoint, creation of the SDR was an official-sector response to an apparent official-sector problem.

In this Essay, the argument is based upon a different view of what constitutes the fundamental international monetary problem. In contrast to domestic monetary systems that have a unique medium of exchange, the international economy has no single money that all are obliged to use and accept. It is usual to argue that households and firms hold balances of domestic money in some relation to their domestic transactions. It might also be expected that they would wish to hold internationally acceptable moneys in some relation to their international transactions. If this is correct, then it is the provision of internationally acceptable money that is the fundamental problem, not the provision of official reserves. At present, this role is filled by the currencies of particular countries, especially the dollar, but so long as there are close substitutes, externally held balances of national currencies are a potential source of instability. Unfortunately, prospects for making the SDR the centerpiece of a symmetrical monetary system are nil unless the SDR can be reformed in such a way that it obtains characteristics at least as desirable as those of the dollar.

The medium-of-exchange approach to international monetary issues is not entirely new. Swoboda (1968) and McKinnon (1969) incorporated aspects of it into their analyses, and some empirical support is presented in Chrystal (1975, 1976, 1977). The novel feature of this Essay is its use of that approach to draw new implications for the operations of the international monetary system and for the reform of international institutions. The argument is developed first by a selective survey drawing attention to the convergence of previously disparate analyses. There follows a discussion of the relationship between private and official international money holdings. Finally, there is an assessment of the SDR.

Existing Arguments

The Transactions Demand for Money

Prior to the twentieth century, writers on money were not concerned to identify the precise nature of what have come to be called demand functions for money. Rather, classical economists had a twofold concern, first with the relationship between the money stock and the price level, and second with the tasks money performs in an economy. Those tasks were to serve as a medium of exchange, a store of value, and a unit of account, the first two of which required the physical presence of a money token, the last of which did not. The two concerns of older writers have aroused renewed interest among modern monetary theorists, but the approach they adopt would appear to be of greater technical sophistication.

Curiously, it was the classical concern with the relationship between money and the price level rather than with analyses of the functions of money that was the precursor to modern theories of the demand for money. In particular, the Quantity Theory implied that, for a given level of real transactions and fixed velocity of circulation of money, the price level would be proportional to the size of the money stock. It was Wick-sell (1898, Chap. 5) who first noted of this theory that it is based upon the demand for money as a medium of exchange. "It assumes that everybody maintains, or at least strives to maintain, his balance at an average level that is constant (relatively to the extent of his business or of his payments)." Keynes (1936) built upon this demand-for-money approach by postulating four separate motives for holding money: the income motive, the business motive, the precautionary motive, and the speculative motive. In his subsequent argument, he merged the first two as the transactions motive and the last two as the speculative motive. It is worth noting that the transactions motive can be broadly associated with the medium-of-exchange function of money, whereas the speculative motive corresponds to the store-of-value function. It is the transactions motive and the resultant transactions demand for money that is of particular interest here.

There have been two major theoretical developments concerned with the transactions demand for money. Both involve a formalization of the optimal behavior of a decision-making unit transacting in an economy with a unique money as the means of payment.

The first approach is by Baumol (1952), who looks at the optimal average cash balance for an individual who has to make a steady stream of payments for which he withdraws cash from interest-bearing assets. Since

Baumol assumes that there is a fixed brokerage cost per withdrawal, it follows that withdrawals will be made in discrete lumps and thus that the average cash balance will be positive. But the significant result is that the average cash balance grows less than proportionately to the size of the stream of payments that the individual must make. Specifically, Baumol shows that the average cash balance grows in proportion to the square root of the level of payments. This result does not apply, however, if the cause of an increase in payments is merely a rise in the general price level (i.e., inflation), because an increase in payments that is accompanied by a proportionate increase in brokerage costs will cause the average cash balance to rise in strict proportion to transactions. Therefore, transactions economies of scale with respect to cash inventories occur only for a *ceteris paribus* increase in real transactions.

The second important contribution to the transactions approach to the demand for money is by Miller and Orr (1966). They are concerned with a situation in which the decision-making unit has neither continuous nor discrete payments and receipts. Rather, inflows and outflows of cash are viewed as being generated by some stable statistical process, and a simple rule is adopted to restore cash balances to some target level by withdrawing cash from, or converting cash into, interest-bearing assets whenever the actual balance reaches an upper or lower bound. Surprisingly, this model implies a relationship between average cash balances and transactions very similar to that of Baumol's model. Average cash balances rise in proportion to the square of the cube root of transactions. In the Miller and Orr experiment, then, the transactions elasticity of demand for cash balances is two-thirds, whereas in the Baumol model it is half. In both cases, average cash balances demanded rise less than in proportion to a rise in real transactions. This result will be invoked in relation to the transactions demand for international money.

The Demand for International Reserves

In contrast to transactions-demand theory, which is concerned with the behavior of trading individuals, the vast bulk of international monetary literature has focused on the stock of reserves held by governments or their central banks. It is worth looking at a typical recent approach to the demand for international reserves. One of the most elegant analyses is that of Clark (1970). Assuming a fixed-exchange-rate regime, he views reserves as a buffer stock, the use of which permits a degree of flexibility in the adjustment of domestic imports following an exogenous change in exports. Imports are assumed to be regulated by domestic ag-

gregate demand policies. The probability of running out of reserves can be held to a given level either by holding a high average level of reserves and allowing a slow adjustment of imports, or by holding lower reserve levels and adopting a faster speed of adjustment. Since imports are adjusted by changing domestic income and since reserve holdings have a real opportunity cost, the reserve problem can be formulated as a tradeoff between the level and the variability of income. Faster adjustment of imports to any change in exports produces a greater variance of income, but a higher reserve level produces a lower income level owing to the opportunity cost of holding reserves. Target levels of reserves are therefore chosen to maximize utility, which is positively related to income and negatively related to its variance.

The preoccupation with official holdings exemplified by Clark's model was easy to explain in an era of fixed exchange rates, when central banks had to maintain balances of reserves in order to support the price of the domestic currency in the foreign-exchange market. Crises resulted when reserves ran out. The same focus, however, led to the tendency to lose sight of the fact that the maintenance of fixed exchange rates may not be the sole reason for holding balances of foreign currencies, even within the official sector. Now that fixed exchange rates are no longer as dominant, studies that attempted to throw light on the "demand for international reserves" or the "adequacy of liquidity" are difficult to interpret or to apply. But two points emerge clearly from an examination of earlier literature: (1) There have always been good reasons for a trading nation to hold balances of externally acceptable money. And (2) there was a distinct tendency for such balances to be pooled long before exchange-rate pegging made official holdings of reserves mandatory.

As an example of the first point, Thornton (1802, p. 153) viewed gold reserves as a kind of buffer stock that, even though not "officially" held, effectively performed a function very similar to that discussed by Clark. The need to hold gold reserves had nothing to do with the exchange-rate regime, merely with the fact that they were acceptable in payment abroad, whereas domestic paper money was not:

The common manufacturer, if he understood his own interest, would approve rather than complain of the temporary substitution of paper for gold, which has been thus occasioned; for the export of gold has served to ease him in the first instance: his labour, indeed must hereafter purchase back again the gold which has been exported, but he will have to buy it back by exertions less severe than would otherwise have been needful.

In this context, subsequent arguments in Britain during the nineteenth century between the "currency" and "banking" schools can be viewed as

a discussion about international reserves. The currency school was in effect proposing that the domestic money supply should equal the country's stock of internationally acceptable money, whereas the banking school thought that the domestic money supply could safely exceed the country's stock of reserves.

One of the first writers to discuss international reserves from the point of view of their medium-of-exchange function was Marx (1886, Part 1, Chap. III, Sec. 3c), who said: "Just as every country needs a reserve of money for its home circulation so too it requires one for external circulation in the markets of the World."

Both Thornton and Marx were talking about stocks of reserves that need not be centrally or "officially" held. Indeed, the reserve holdings they were discussing antedate the very existence of central monetary institutions as they are now known. They were certainly not discussing the reserve holdings of the monarch. In brief, there are long-established precedents for arguing that members of an open economy will choose rationally to hold balances of moneys that are acceptable to foreigners, for reasons very similar to the domestic medium-of-exchange function discussed above. The exchange-rate regime is of minor importance in this context.

At this point, the common ground between the public's demand for "reserves" and the demand for money is clear. The literature on the demand for money has been concerned with the special case of a closed currency area, but once there is trade between two or more currency areas, international media of exchange must be incorporated. There will be a demand for balances of moneys that are internationally acceptable in addition to a demand for the domestic medium of exchange.

As an example of the second point, that reserves were pooled long before exchange-rate pegging made official holdings mandatory, Bagehot (1870, Chap. II) clearly described the Bank of England as a reserve depository in the nineteenth century. Traders did not individually hold their own balances of external money but to a large extent deposited them instead in a few deposit-taking institutions. "The Directors of the Bank are, therefore, in fact if not in name, trustees for the public, to keep a banking reserve on their behalf."

It is not difficult to think of reasons why this pooling of reserves might come about. There is an opportunity cost to the holder and the country associated with holdings of an external money. Further, as has been seen, there are reasons to expect economies of scale in money holding. A pooled reserve could thus be smaller than the sum of individually held balances, and the opportunity cost to the nation as a whole could thereby

be reduced. It should be no surprise, then, to find Bagehot continuing: ". . . But the danger to the depositing banks is not the sole or principal consequence of this mode of keeping the London reserve. The main effect is to cause the reserve to be much smaller in proportion to liabilities than it would otherwise be."

Bagehot was not trying to argue for the existence of economies of scale. On the contrary, he thought the situation to be potentially dangerous. But his factual observation is valid and may merely indicate that the Directors of the Bank knew their business rather better than Bagehot did. The implication of this argument, however, is important. So long as we have trading domains within which there are different currencies, and so long as there is actual or potential trade between members of different currency areas, some individuals may be expected to hold balances of foreign currencies. Some of those balances may rationally be held centrally or jointly. There could thus be a reason for central reserve holdings whatever the exchange-rate regime, although the type of regime will affect both the total size of the stock of foreign money a country will choose to hold and the proportion of that stock that is centrally held. As I argue below, this point has important implications for institutional development. These have been missed because most writers have taken a myopic view of reserves as being solely an instrument for exchange-rate support and therefore an official-sector problem.

The Vehicle-Currency Hypothesis

The idea that money balances might be required to fulfill the function of international media of exchange is not entirely new, but when the point has been made, the focus has been on the private trading sector. There has been no clear attempt to link the needs of the private sector with the behavior of the official sector (but see Cooper, 1972). Before discussing the nature of this link, it is useful to outline the three main elements of the literature concerned with what Swoboda (1968) calls "vehicle" currencies, or what I call international media of exchange. First, the theory of transactions demand for money is applied to international transactions. Second, the "vehicle-currency hypothesis" states that significant economies result from the conduct of international trade in terms of few currencies. And, third, there is a need to explain why certain national currencies are used as international money in the absence of a supranational currency.

The transactions demand for money acceptable internationally is treated by Swoboda in a manner similar to the transactions demand for domestic money discussed above. An individual is assumed to have a steady

stream of foreign-currency payments to make and withdraws the necessary cash from domestic interest-bearing assets in discrete lumps, as in Baumol's model. The result is that the average balance of foreign currency will be proportional to the square root of real transactions made in that currency. It would also be possible to apply the Miller and Orr (1966) model mentioned above, in which case the trader would have stochastic payments and receipts. Here, the average cash balance would turn out to be proportional to the square of the cube root of transactions. In either case, transactions economies of scale are shown to exist in the sense that, as trade increases, average money balances increase less than proportionately.

The existence of transactions economies of scale is used by Swoboda (1968) to make the second point, that, in a world of many currency areas, inter-currency-area trade would not be conducted in every one of the different national currencies. If traders had to use and hold a multitude of currencies, they would have to devote much larger resources to holding and managing cash balances than if all international transactions were conducted in one currency. An alternative path to the same conclusion, which relates rather to the numeraire function of money, is offered by Brunner and Meltzer (1971). Through an analysis of the informational efficiency of monetary exchange they "suggest by implication the benefits that would accrue to the world economy from the use of a medium of exchange." Their key proposition is that the marginal cost of acquiring information about the properties of any asset declines with an increase in the frequency with which that asset is used. McKinnon (1969) combines the transactions-demand and the informational-efficiency arguments when he suggests that "private traders would concentrate their transactions in the most suitable major currency in order to economize on inventory-carrying costs and to minimize the informational uncertainty arising from floating rates." A further important point, made by Swoboda, is that where there are risks involved, specialization in the use of a single national currency may not be complete, since there will be gains from diversification. This means that a small group of internationally acceptable moneys is likely to emerge rather than one dominant money.

The final question concerns which currencies actually come to be used as international moneys if the choice is left to market forces. Swoboda (1968, p. 10) has pointed to a number of important factors:

. . . In the first place, asset-exchange costs play an important role in this choice. For instance, conducting transactions on income account in dollars will be preferred to conducting these transactions in Dutch guilders if the

asset-exchange costs from dollars to domestic currency are lower than those from guilders to domestic currency. It is likely that asset-exchange costs depend inversely on the size of the market for a particular asset: economies of scale in financial intermediation are likely to arise if only because of familiarity and bookkeeping economies. The size of the market for a particular currency depends, in turn, in part on the size of a country's foreign transactions and, therefore, on the volume of its external trade and the structure of its balance of payments.

Second, he continues, holders are likely to be risk averse, so that the currency chosen will be one with a market characterized by "depth, breadth and resilience." There is a greater probability of loss from selling on a small market than on a large one. Finally, for similar reasons, no currency whose exchange value is likely to fluctuate widely is likely to be held as an international money for very long. Taken together, these arguments clearly suggest that the currencies that come to be used in international transactions will be those of the dominant trading nations, in the absence of a *marketable* currency issued by a supranational authority.

Currency Substitution

A final body of relevant literature examines what has come to be called "currency substitution" (Calvo and Rodriguez, 1977; Girton and Roper, 1976). Citizens of some countries may be able to hold external money, in addition to the internal money. They hold external money for "speculative" purposes, that is, because it is a better store of value than the internal money. The faster the rate of depreciation of the domestic currency, the larger will be domestic holdings of external money.

This analysis identifies a potentially important process in international economics that is closely related to the theory of optimal currency areas (McKinnon, 1963). Its practical importance is limited, however, because in every economy where speculative foreign-currency holdings are likely to become important, strict foreign-exchange controls and restrictions on overseas investment are imposed. Obvious examples are such countries as Israel, Italy, and the United Kingdom, not to mention countries that have even higher inflation rates. Obvious examples of countries that do not have restrictions, such as West Germany and Switzerland, often have the opposite problem. They try to restrict *foreign holdings of their domestic money*.

In every country that imposes exchange controls, there is one loophole through which foreign currency can pass. Foreign-exchange dealers, traders, and travelers must be permitted to hold working balances of the moneys they need for their transactions. Such balances will be allowed

to increase with economic activity, but the scope for permanently increasing speculative balances is severely limited. For the most part, the only remaining major mode of speculation is to lead and lag trade payments relative to an underlying trend determined by the growth in trade. *It is trading economies that hold significant foreign-currency balances, not high-inflation countries* (see Chrystal, 1976, for evidence on this point).

Since most currency areas have passed legislation that successfully restricts the holding of external money, there is no serious objection to the existence of a foreign currency that has characteristics superior to all other currencies. Currency substitution can, on the whole, be prevented without seriously impairing the efficiency of the real economy. It would however, be conventional to argue that portfolio restrictions are inconsistent with the existence of a *global* welfare optimum (Kareken and Wallace, 1977).

Money in the International Economy

The arguments that have been outlined here have been drawn from the literature. Some of them must be developed or refined before their major implications for the role of the SDR can be pointed out.

Private and Official Holdings

An important element of the view propounded here is that there is a strong link between private and official holdings of international money. The vehicle-currency literature has concentrated on the private sector and the international-reserve literature has concentrated on the official sector, when, in fact, these are subsets of the general problem posed by the need for international moneys. What has to be considered, then, is the relationship between central-bank and private demands for stocks of international money. It is convenient to proceed by analyzing a number of conceptual situations.

Consider first a gold-standard world where the base money is the same externally and internally, though domestic circulation is predominantly in deposit notes and external payment is only in bullion. There is no significant official sector. Every trader with transactions abroad will need to have a stock of bullion at his disposal, and there is a strong likelihood that this bullion will be held with a deposit-taking institution. If there are economies of scale to bullion holding, the number of such deposit-taking institutions will be small.

There will be a real resource gain to the economy as a whole from the