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To: Members of the Executive Board

From: The Secretary

Subject: The Role of Reserves in the International Monetary System

The attached paper on some aspects of the role of reserves in the international monetary system has been prepared for a forthcoming meeting of the G-10 Deputies. It is now being circulated for the information of the Executive Directors before being transmitted to the G-10 Secretariat.

If Executive Directors have technical or factual questions relating to this paper, they should contact Mr. Hood (ext. (5)8977) or Mr. Rhomberg (ext. (5)8976).

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INTERNATIONAL MONETARY FUND

The Role of Reserves in the International Monetary System

Prepared by the Staff

December 10, 1984

In June 1984, the G-10 Deputies were provided with a paper entitled "Control of International Liquidity and Reserve Creation," which argued that, in the current international monetary system, there is no effective multilateral control over the growth of international reserves and liquidity. While control is exercised over those elements of liquidity provided through the Fund (e.g., SDRs) and short-term official credit ("swap") arrangements, liquidity and reserve creation in other forms can be influenced only by altering the terms on which these credits are supplied by international financial markets. Since conditions in financial markets reflect to an important degree the economic policies of individual countries, international surveillance over these policies provides the only effective mechanism for control of international liquidity.

This paper extends the analyses of the role of international reserves in the current international monetary system. In particular, there is an examination of the extent to which international reserves are a fundamental determinant of the system's performance and to what extent they are themselves a feature of that performance. More technically, this is the question of whether the total of reserves (or some vital component of reserves) is an endogenous variable of the system or an exogenous variable, determined either by forces essentially outside of the system or as a matter of deliberate policy by some authority. The answer to this question also bears on the issue of whether it is meaningful to consider when and under what circumstances the system needs an injection of reserves. The analysis of the paper suggests that international reserves tend to adjust to the demand for reserves and are not an important independent determinant of economic developments. In the present circumstances, the principal alternatives for controlling international reserves and improving the performance of the international monetary system are either to alter the basic structure of the current system so as to make it possible for the authorities to control the growth of total reserves or to work within the existing system to enhance the role of Fund surveillance over economic policies.

Plan of study

The paper has two main sections. Section I briefly traces the evolution of the role of reserves in the gold standard, gold exchange standard, and the current international monetary system based on multiple reserve currencies. In the gold standard and gold exchange standard systems, the fixed price of gold and the relatively stable physical stock

of gold combined to constrain both the growth of the overall stock of reserves and the level of prices and economic activity in the world economy. As long as the commitment to fixed gold prices and gold convertibility was maintained, the relatively stable nominal value of the gold stock ultimately imposed limits on the types of policies that could be adopted by individual countries and thereby helped to harmonize policies across countries. In the Bretton Woods system, the progressively greater use of private credit markets and official credit arrangements weakened, but did not sever, the links between the stock of gold reserves, total reserves, and economic policies of individual countries. In contrast, the value of reserves in the current system generally adjusts to a level consistent with the authorities' demand for such assets and the terms on which reserves are supplied in financial markets.

While the systemic role of international reserves has changed, it is nonetheless important to consider the factors that shape the behavior of reserves and the performance of the current international monetary system. Section II of the paper therefore examines the determinants of the demand for and supply of reserves under current monetary arrangements. One motive for holding reserves in the present system is similar to the traditional transactions demand for real money balances by individuals. During most periods, this component of reserve demand results in a gradual expansion of reserves roughly in line with the volume of exchange market transactions undertaken by the authorities. There can also be an "intervention" demand for reserves associated with the authorities' attempts to influence foreign exchange market conditions. Sterilized intervention, which involves changes in holdings of reserves matched by changes in the authorities' holdings of domestic currency securities, has led to changes in the stock of reserves which have been large relative to those associated with the transactions demand for reserves.

The terms and conditions on which reserves are supplied to individual countries reflect conditions in international financial markets as well as official arrangements. Terms set in credit markets depend upon the overall stance of economic policies in reserve-currency countries as well as the creditworthiness of individual borrowers. In addition, terms set by international agreements on various government-to-government credit arrangements can at times be important for decisions regarding the level and composition of reserve holdings.

I. Evolution of the Role of International Reserves

The traditional view

The growth of international reserve assets has often been viewed as a vital element in determining developments in the world economy. This view continues to influence attitudes toward the importance of reserve assets and international liquidity in the current system. The traditional view, in which movements of an exogenously determined nominal supply of international reserves leads to changes in money, prices, and economic

activity in the world economy, appears to be based on an analogy between the role of the monetary base in a closed economy and the role of international reserves in the world economy. In this analogy, the authorities in a closed economy can avoid excessive growth in money and credit if they ultimately control some magnitude such as the monetary base, which consists of the monetary liabilities of the central bank (usually currency and commercial bank reserves). Over time, controlling the size of the monetary base constrains the domestic price level in the sense that there is only one price level that will be consistent both with stable demands for real holdings of currency and bank reserves and with the nominal value of the monetary base supplied by the authorities.

The gold standard

The analogy between the role of the monetary base in a closed economy and the stock of reserve assets in the world economy is most direct under a regime in which all national authorities have currencies that are convertible into gold at a fixed price. When the physical stock of gold is determined by mining technology and the price of gold in terms of national currencies is fixed by agreement, the nominal value of the stock of gold can be identified as the outside nominal magnitude required to determine the level of prices in the system. The private sector's ability to exchange domestic monetary assets for gold at a fixed price creates a strong linkage between the value of gold reserves and the amount of monetary liabilities that could be issued by the authorities. Gold convertibility thus insures that gold reserves provide an ultimate constraint on the size of the monetary base in individual countries.

In such a system, gold reserves have been viewed as having a role similar to the monetary base in a banking system with fractional reserves serving a hypothetical closed economy. The balance sheet of the national authorities has been compared to that of commercial banks in the sense that the authorities hold gold stocks as reserves and issue monetary liabilities to the private sector. The government would not hold an amount of gold equivalent to the stock of domestic monetary liabilities, but only enough to provide confidence that gold convertibility could be maintained. This introduces some elasticity into the relationship between the global stock of gold and the quantity of monetary liabilities. If the demand for gold relative to the authorities' monetary liabilities is stable, however, the fixed price of gold constrains the nominal value of the gold stock and thereby the level of prices, both in individual countries and for the world economy.

It is important to note that the functional similarity between the gold stock in the world economy and the monetary base in a fractional reserve banking system is not the reason that either serves as the nominal

anchor for their respective monetary systems. In both cases, the crucial element is that these are the nominal stocks that are fixed from outside the system and to which all prices adjust. 1/

Gold exchange standard

Under a gold exchange standard, there exists a comparable key role for the fixed nominal stock of gold reserves. However, in such a system there is a less rigid link between the gold stock, domestic monetary aggregates, and prices and output. The link is less direct than in a gold standard because of the more active use of credit arrangements as a source of reserves and the existence of restrictions on gold convertibility in the gold exchange standard. Nevertheless, as long as at least one country maintains convertibility of its currency into gold, monetary liabilities in that country would be limited by the given nominal value of its gold holdings. Excessive issuance of domestic monetary liabilities (relative to the countries' stock of gold) could lead the private sector to convert its domestic currency into gold at a rapid rate in anticipation of a suspension of gold convertibility. Moreover, price levels in other countries with nonconvertible currencies would be constrained by the fixed or managed exchange rates between their currencies and the convertible currency. The link between price levels, economic activity, and the gold stock becomes more flexible as the use of credit arrangements as a source of reserves expands. For example, in the Bretton Woods system, the authorities of both the country maintaining gold convertibility and other countries at times arranged with one another and with private credit markets procedures that to some extent augmented gold movements as a means of settling net payments among countries. In addition, claims on the convertible-currency country were accumulated by other countries as reserve assets. As long as these potential claims on the convertible-currency country's gold holdings were not exercised, these gold holdings were insulated.

In the Bretton Woods system, these developments meant that there was an important component of reserves that was endogenous to the policies of individual countries. A country could have increased its reserve holdings by acquiring claims on reserve-currency countries. However, as long as the willingness of countries to acquire such claims was limited, the constraint on the economic policies of the reserve-currency country was not eliminated, in part because the threat of conversion remained. While credit arrangements substituted for gold flows in the system, they did not totally eliminate the constraint imposed by the combination of gold

1/ To illustrate this point, a monetary system for a closed economy can be considered in which the authorities choose to target a broad monetary aggregate rather than the monetary base. In this policy framework, the price level would still be constrained as long as there is a stable demand for that targeted aggregate. In turn, the authorities would have to adjust the monetary base to a level that would satisfy the demand for the monetary base resulting from the economic conditions generated by the maintenance of the target for the broader monetary aggregate.

convertibility and the existence of a given stock of gold on the authorities' domestic policies. If countries with nonconvertible currencies wished to hold a larger share of their portfolios in the form of gold instead of financial claims on the reserve country, for example, then a given overall stock of gold would have been able to support only a smaller total stock of international reserves. For this reason, the growth of gold and other primary reserves remained an important policy issue under the Bretton Woods system. If the nominal stock of gold grew slowly or not at all, then a rising demand for reserves would have created a clear need for additional reserves, especially for reserves that could have augmented or substituted for gold reserves.

During the period since World War II, the crucial link between prices and the fixed nominal stock of gold imposed by the presence of gold convertibility was progressively weakened. Nonreserve-currency countries with access to credit markets were able to increase their reserve holdings through borrowing, and this led to a rising ratio of total reserves to gold reserves. Moreover, the convertibility commitment was restricted, and this further weakened the linkages between the policies of reserve-currency countries and their gold holdings. The abandonment of the effort to fix the market price of gold in 1968 meant that convertibility into gold became restricted to official institutions. The suspension of convertibility of the U.S. dollar into gold in 1971 removed even this constraint from the system.

The current system

The current system represents the culmination of an evolutionary trend in which the importance of the level of reserves as a constraint upon policy has progressively declined for countries having access to international capital markets and, in particular, for the reserve-currency countries. The suspension of convertibility of the U.S. dollar and the collapse of the system of fixed exchange rates were further--and definitive--steps in that evolution because the collective demand for reserves no longer reflected the need to meet conversion and intervention obligations. Of course, these developments did not imply that national authorities no longer wished to hold gold and other reserve assets.

With the weakening of the reserve constraint, countries sought other ways to guide their economic performance, individually and collectively. For example, the post-1971 system relied heavily on targets for monetary and credit aggregates in the major industrial countries. Such control techniques did not, of course, appear de novo; they were increasingly experimented with as the system evolved toward the climactic events of the early 1970s. Moreover, the widespread adoption of floating in no way implied that a country's policy choices had no effects beyond its own borders. On the contrary, experience since 1971 reinforces the view that countries have common interests in setting their economic policies; these interests manifest themselves in growing support for international surveillance over these policies.

II. The Role of International Reserves and Liquidity in the Current International Monetary System

This section analyzes the role of reserves in the current system based on multiple reserve currencies. The major conclusion of this discussion is that, in the current system, the sum of the demands for reserves by countries is no longer constrained by a fixed stock of reserves or a fixed component of that stock. The supply of reserves is now best described as a schedule that relates the amount of reserves supplied by financial markets to different market conditions. Countries tend to adjust their reserve holdings until the benefits derived from such holdings are equal, at the margin, to the net cost of holding reserves. Under normal conditions, the marginal cost of obtaining and holding additional reserves in private financial markets is relatively constant. This implies that the demand for reserves by individual countries is generally accommodated in the current system with little change in overall economic conditions. As noted earlier, however, the absence of outside control over the stock of international reserves does not imply that the international monetary system is prone to excessive or explosive growth of money and credit or contains an inflationary bias. Price stability in the current system reflects the maintenance of anti-inflationary policies in individual countries rather than limitations on the global stock of reserves.

The demand for reserves

The role of reserves in the current system can be described by first considering the factors influencing the demand for reserves and then turning to the sources of reserve growth. For analytical purposes, it is useful to distinguish two components in the overall demand for reserves on the part of individual countries. The more familiar motive is reflected in a "transactions" demand and is usually related to the scale of international transactions carried out by the country. During normal periods, the authorities want to hold a stock of reserves that enables them to meet the public sector's foreign exchange transactions and to offset the seasonal and transitory changes in the private sector's demand for foreign exchange. While this desired level of reserves would be influenced by the real cost of holding reserves and the nature of exchange market arrangements, these holdings would tend to be a fairly stable function of the volume of exchange market transactions considered likely by the authorities.

The second component of the authorities' demand for reserves is related to their desire to establish a net foreign currency position in order to influence exchange rate developments. The net foreign currency position reflects the difference between a country's assets and liabilities denominated in foreign currency. The types of assets and liabilities entering into this calculation vary across countries but, in general, include both short- and long-term financial instruments. The net foreign currency position of the government therefore reflects holdings not only of reserve assets but also of other foreign currency assets and liabilities. The authorities can seek to influence the terms (including the level of

the exchange rate) that equilibrate financial markets by altering their net foreign currency position and thereby that of the private sector. Since the authorities can alter their holdings of many types of assets and their issuance of a variety of liabilities, changes in a country's net foreign currency position may not involve movements in foreign exchange reserves. Such changes can, however, affect reserves when they involve sales or purchases of reserve assets in the course of intervention in the foreign exchange markets.

Intervention can take the form of either "sterilized" or "unsterilized" purchases or sales of foreign exchange by the domestic monetary authorities. Unsterilized sales of foreign exchange by the domestic central bank, for example, involve the exchange of foreign currency reserves for domestic monetary liabilities. In this situation, the stock of domestic monetary liabilities changes in line with holdings of foreign exchange reserves. In contrast, with sterilized intervention, the impact of sales or purchases of foreign exchange reserves on the stock of domestic monetary liabilities are offset through open market operations by the domestic authorities. The loss or gain of foreign exchange reserves would thus have no direct effect on the stock of domestic monetary liabilities.

Since 1971, as before that date, central banks' intervention in the foreign exchange market has often involved (especially for the major industrial countries) some form of sterilized intervention, which permitted adherence to existing domestic monetary policy objectives. The resulting changes in net foreign currency positions and reserve holdings were at times quite large. Countries were willing to undergo these reserve movements in order to mitigate pressure on the exchange rate or to avoid adjustments in domestic policies. The level of reserves per se does not appear, in general, to have been an important independent policy goal.

Supply of reserves and liquidity

Given these determinants of the demand for international reserves, there is the issue of how the current international monetary system responds to a change in the demand for reserves on the part of a number of countries. Under the current system, the total stock of reserves can adjust to changes in the demand. This supply response is not constrained by forces outside the international monetary system even though supplies of specific reserve assets may be fixed. Countries with access to international capital markets have often found borrowing from private financial institutions an efficient means of obtaining additional foreign exchange reserves. An individual country can borrow at a net cost equal to the lending rate (inclusive of the risk premium) less the deposit rate paid on reserves (or the yield on securities). ^{1/} This net carrying cost of

^{1/} In addition to the acquisition of reserves through actual borrowing from private markets and intervention in the foreign exchange markets, countries can arrange for lines of credit from either private financial institutions, central banks, or other official institutions.

reserves can be quite small for countries with good credit ratings, especially relative to the costs of changing other policies in order to generate an overall balance of payments surplus.

Access to credit markets means that the supply of foreign exchange reserves is not necessarily tied to the structure of current account balances of any group of countries (including the reserve-currency countries). The counterpart to a given country's current account deficit is the accumulation of domestic assets by foreign entities or the sale of foreign assets by domestic residents. This exchange of assets could be undertaken either by the private sector (which would not directly lead to reserve accumulation) or by the authorities (which can reflect intervention activity in the foreign exchange market and can thereby result in reserve accumulation).

Even under normal conditions, different countries will face divergent costs of maintaining reserves. As noted earlier, for countries with access to international capital markets, additional reserves can be obtained at a relatively low cost. Borrowing rates differ among countries since they reflect creditworthiness; the major industrial countries generally have the lowest borrowing costs. Even reserve-currency countries face a cost of acquiring foreign exchange reserves through borrowing, namely, the difference between the cost of servicing their own obligations and the return they obtain from holding assets denominated in foreign currencies.

A country would not want to follow policies that could jeopardize its ability to borrow, but this is a much different constraint on the authorities' policy options from that imposed by the existence of a fixed gold stock and gold convertibility in a gold standard or gold exchange standard. Most important is the fact that the country's access to credit markets depends on creditors' assessment of the country's ability and willingness to make the real transfers necessary for servicing its debt. The ability to repay is consistent with a variety of domestic policies. The credit constraint is a constraint on the behavior of the authorities, but it does not directly control the evolution of economic activity in individual countries or for the world economy as a whole.

The role of reserve holdings for financially constrained countries, which do not have access to international capital markets, is different from that described above. Countries that have exhausted their ability to borrow at their own discretion can adjust their holdings of international reserves only through the net sale of goods and services to nonresidents or through intergovernmental borrowing. The accumulation of additional reserves, therefore, imposes a high real cost associated with the adjustments of domestic macroeconomic and exchange rate policies needed to achieve a balance of payments surplus. For these countries, it is likely that reserve holdings will correspond to minimal working balances.

The terms on which reserves are supplied to individual countries thereby reflect a number of considerations including a country's creditworthiness, conditions in credit markets, and various international

agreements concerning the provision of official reserve assets. The role of official actions to affect the supply of reserves, such as SDR allocations, is that they will influence the behavior of countries' authorities by changing the cost to them of acquiring and holding reserves. Perceptions of these costs will vary from country to country and will depend on individual circumstances. An analysis of the role of SDR allocations must, therefore, be linked to a view of how the international community wishes to manage these costs for individual countries under current and prospective conditions.

The adequacy of international reserves

The above discussion of the supply and demand for reserves in the current international monetary system suggests that, given the underlying conditions prevailing in markets for goods, financial assets, and foreign exchange at any point in time, the overall stock of reserves is determined simultaneously with exchange rates, interest rates, prices, trade flows, and economic activity, which all reflect the policies adopted by countries.

The questions of when the international monetary system needs reserves or how an excess demand for reserves influences conditions in the world economy have fundamentally different answers in the current system and under the gold standard or gold exchange standard. Since an increase in the demand for reserves will bring forth a larger supply, the concept of reserve adequacy in the current system must focus on the terms and conditions on which reserves are supplied. In addition to a country's credit standing, the most important determinant of these terms and conditions, as well as of the overall performance of the multicurrency reserve system, is the policy conduct of the reserve-currency countries. Since most countries have a range of choices as to type of instrument and currency composition in which they hold their foreign exchange reserves, these portfolio decisions are often affected by the return on and stability of the value of different types of reserve assets. ^{1/} Economic policies in reserve-currency countries that cast doubt on the relative value of their currencies, or the value of currency reserves relative to other assets, can lead to defensive portfolio shifts among reserve holders that disrupt the functioning of the current system. It could be noted in this regard that, unlike the gold exchange standard system, the present system does not contain a systemic constraint on the policy choices of the reserve-currency countries in the form of a convertibility obligation. For this reason, Fund surveillance over the policies of reserve-currency countries should reflect the special obligations of these countries in the present system.

^{1/} For countries trying either to maintain a target exchange rate or to achieve a given net foreign currency position, however, the required scale of intervention activity may force the country to focus its holdings of reserves on a particular currency or set of currencies which it uses most heavily.

The adequacy of reserve availability for countries without access to international financial markets requires additional considerations. Such countries face a close linkage between their adjustment policies and their ability to accumulate reserves. For these countries, the supply of reserves reflects their success in pursuing domestic policies that result initially in a favorable balance of international payments. The adjustments required to generate payments surpluses imply that the cost of reserve accumulation for these countries is much higher than for countries with access to international capital markets. For this reason, the supply of reserves generated by international agreements takes on special importance. The terms on which such countries receive assistance in acquiring reserves, for example, through SDR allocations or other government-to-government credit arrangements, directly influence and should explicitly support their adjustment efforts. In this context, the role of surveillance over the sometimes difficult adjustment efforts of financially constrained countries and the international cooperation necessary to tailor the terms on which reserves are available to these countries should not be separated. The basic question is how the provision of credit among national authorities can increase the effectiveness of adjustment efforts.

More generally, the demand for different kinds of reserve assets, including SDRs, will depend on expectations regarding the future costs of obtaining reserves. Even the remote possibility of a breakdown in the availability of reserves through private international financial markets would lead countries to provide for the use of official reserve instruments when needed. Although it is inherently difficult to calculate the demand for official reserve instruments relative to other types of reserve assets, it is likely that this demand would expand at roughly the same rate as the demand for international liquidity in general. In addition, maintaining the relative position of official reserve instruments in total reserves might facilitate future structural changes in the international monetary system designed to re-establish reserves as an important determinant of economic conditions.

III. Conclusions

The major conclusion of this paper is that the question of reserve adequacy cannot be treated in the same way in the current system as in the Bretton Woods system. While some components of international reserves and liquidity are subject to the control of the international monetary authorities, the overall level of reserves is not determined by forces outside the monetary system and tends to adjust to a level consistent with the demand for reserves. This means that the adequacy of reserves must be discussed in terms of the costs of and conditions under which reserves are supplied. In most cases, these terms and conditions reflect financial market considerations. For this reason, the supply of international reserves is closely tied to the financial policies of individual countries, particularly the policies of reserve-currency countries. Fund surveillance over these policies can play an important role in providing a measure of international control over the provision of reserves.

Greater international control over reserves and liquidity requires either basic structural changes in the international monetary system or enhancement of the role of Fund surveillance. It is unlikely that the structural changes required to re-establish the stock of reserves as an external constraint on the international monetary system will occur in the foreseeable future. All the same, features of the current system that would facilitate such structural changes at a later stage deserve to be kept intact. At least in the near term, greater international control of reserves will depend on the enhancement of Fund surveillance over member countries' policies.