PRINCETON STUDIES IN INTERNATIONAL FINANCE NO. 27

The Demand for International Reserves

M. June Flanders

INTERNATIONAL FINANCE SECTION
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The author, M. June Flanders, is Associate Professor at Purdue University. She is currently on leave from Purdue and is Associate Professor of Economics at Tel Aviv University in Israel. Mrs. Flanders is the author of *The Effects of Devaluation on Exports: A Case Study, United Kingdom, 1949-1954* (1963), as well as a number of articles in the field of international trade and finance.

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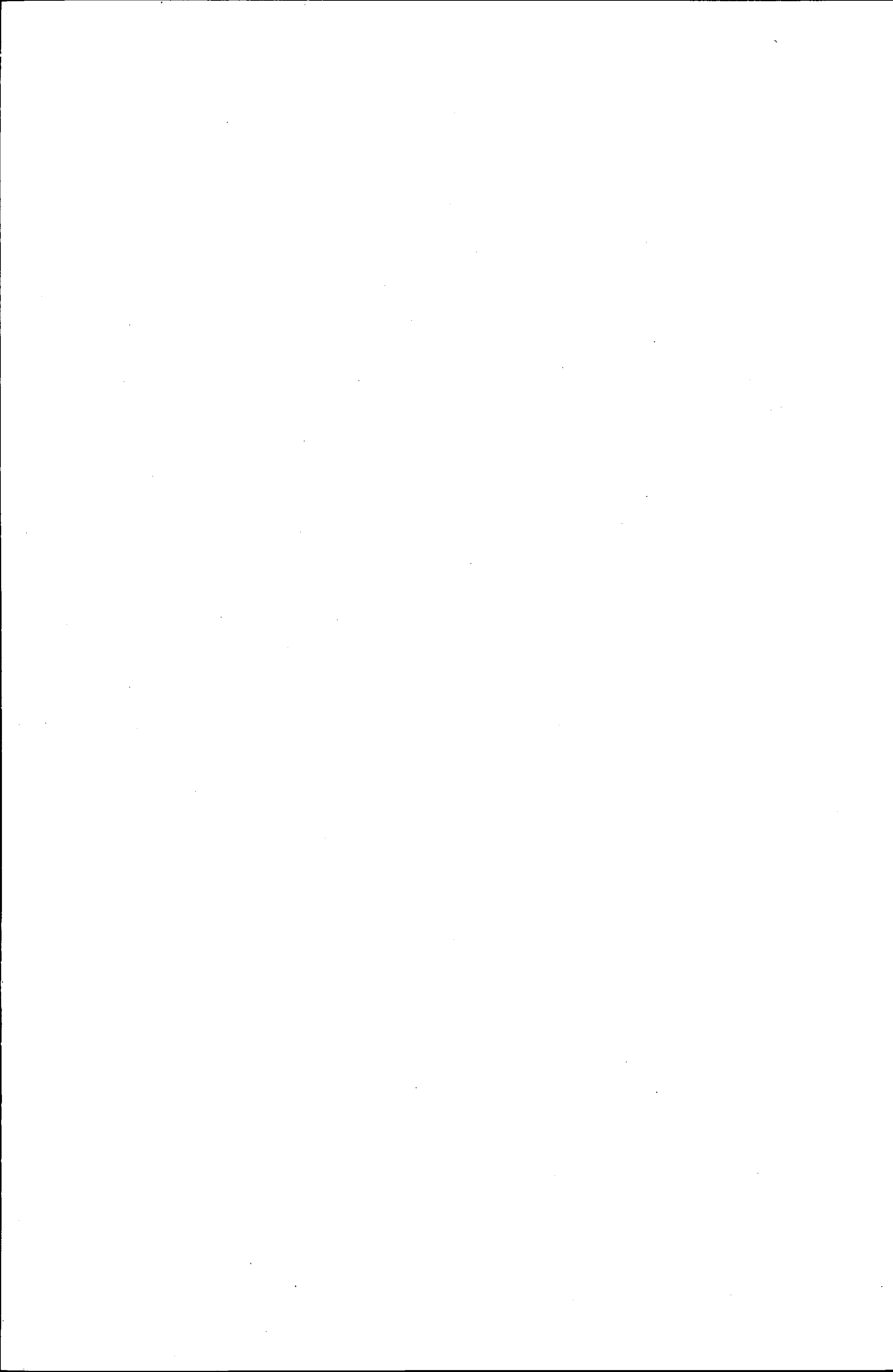

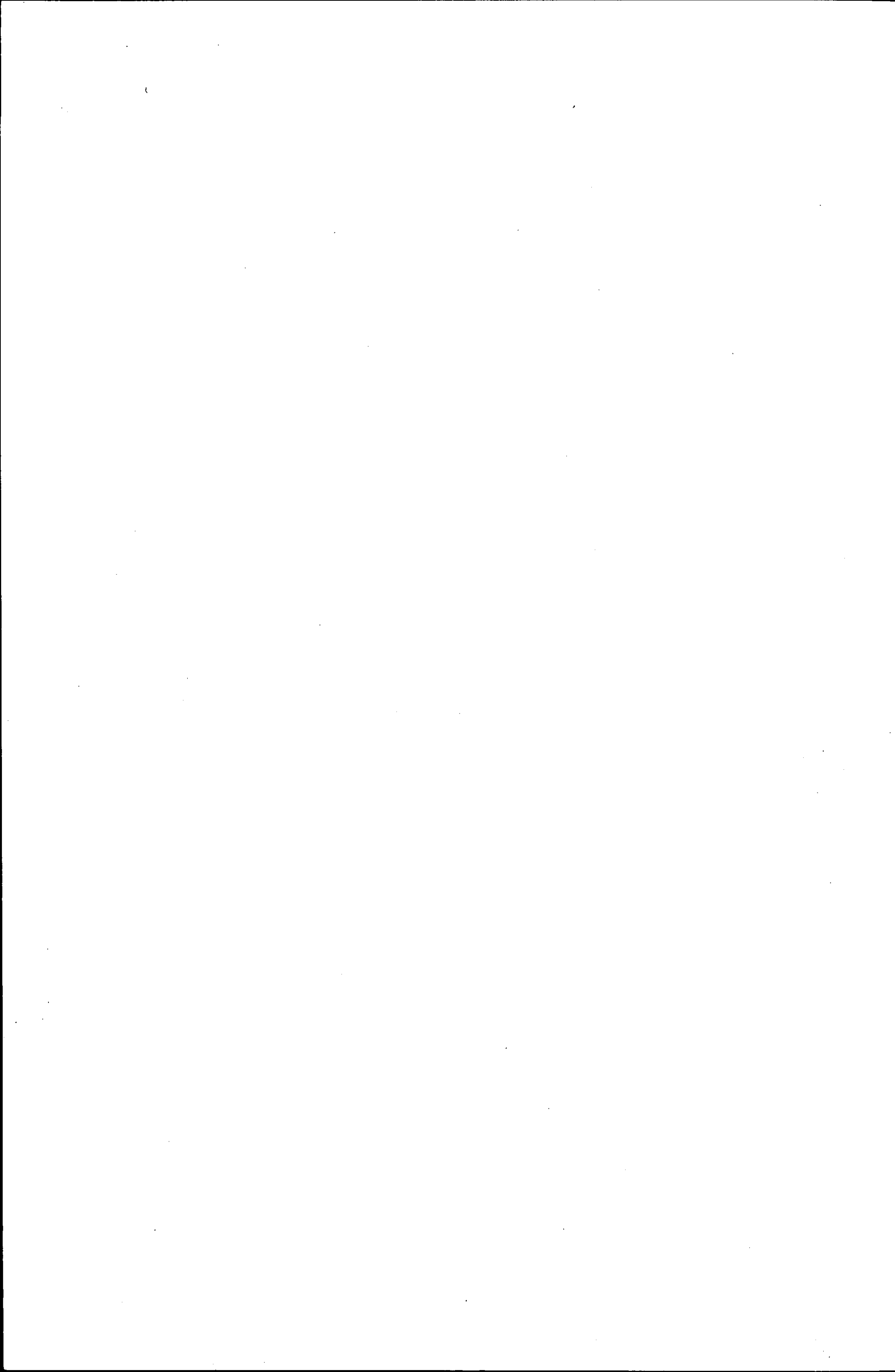

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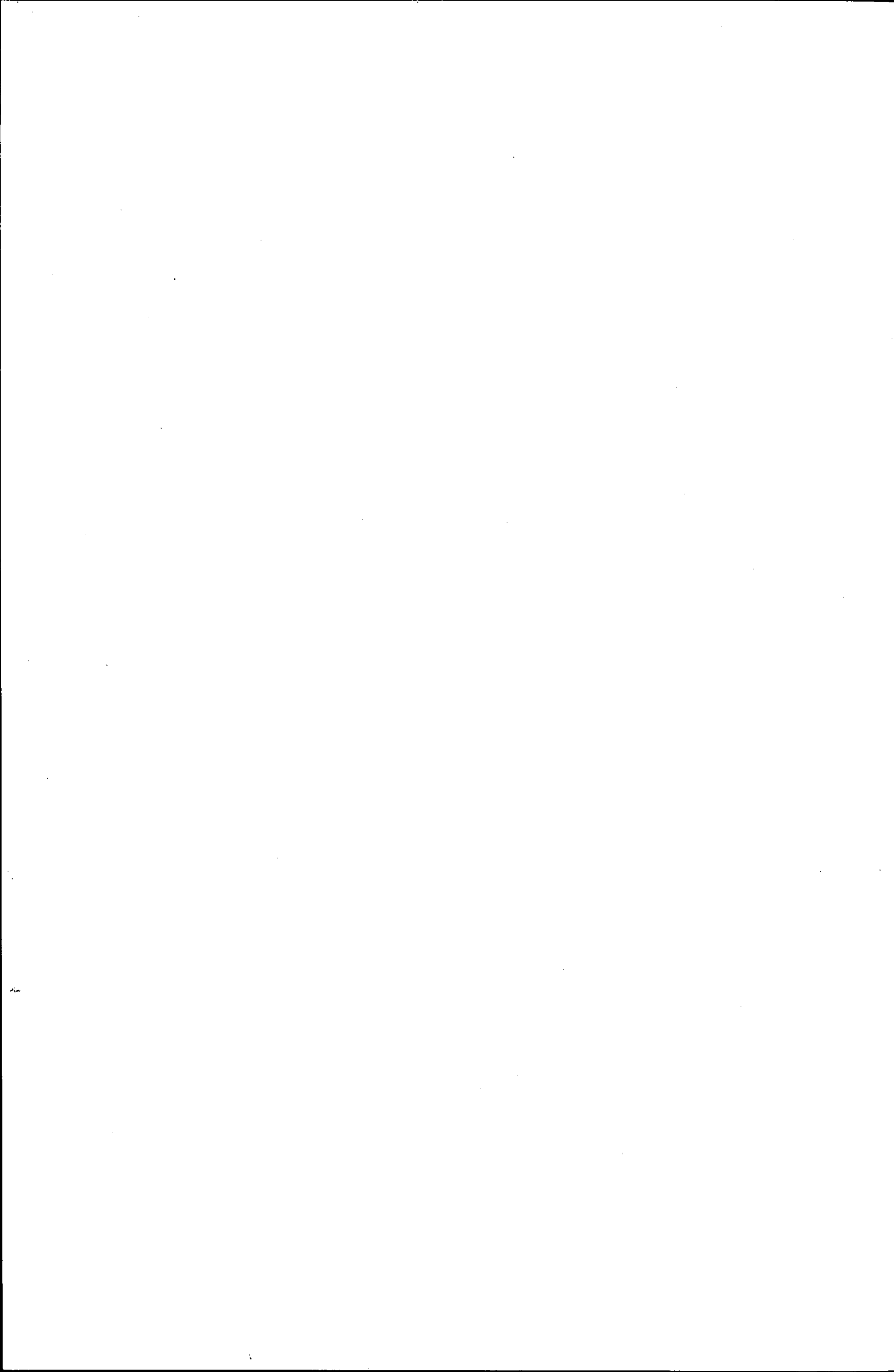

THE DEMAND FOR INTERNATIONAL RESERVES

I. INTRODUCTION

The purpose of this study is to attempt to answer two questions. First, is it possible to explain the behavior of less developed countries (LDC's) in determining their holdings of international monetary reserves? Second, is it possible to make any statements regarding the adequacy of reserves of a particular (less developed) country? The reasons for concentrating this analysis on LDC's will be discussed in detail below. For the moment I note simply that there has been much written and said about the adequacy of the reserves of this particular group of countries; furthermore, there are reasons for expecting their behavior to differ from that of the developed, industrial, rich nations of the world.

First, a brief lexicon may be useful. Until recently it was common to speak of international liquidity and international reserves synonymously. Of late, however, a number of writers have offered definitions (and even measurements) of liquidity which are different from the sum of international reserves.[1] I therefore reluctantly eschew the use of the term liquidity, and, for variety's sake, I use the terms international reserves, reserves, and international money interchangeably.

The analysis is confined to a consideration of gross, owned, official reserves. The figures used are those reported by the IMF for the holdings by monetary authorities[2] of gold and foreign exchange, plus

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[1] See, for example, Machlup (1966), Kane, Cohen.

[2] There are some problems even here: Australia, for example, reports to the IMF the foreign-exchange holdings of the monetary authorities and commercial banks combined, and separate figures are not available. Panama, on the other hand, has no central bank, and all foreign exchange is held by commercial banks. Furthermore, there are differences between countries in what is included in "official

reserve positions at the Fund.[3] I employ this simple, gross concept of reserves for several reasons: (1) it is relatively easy and straightforward to collect data for it; (2) the figures are comparable, both over time and between countries; (3) it is conceptually unambiguous, and (4) in terms of our analysis, this is precisely the item we wish to examine. Just as studies of individual monetary behavior concentrate their attention on the cash balances (rather than the overall balance sheets) of firms and individuals, we shall be exploring the patterns of "cash holdings" of countries.[4]

International money is that which countries use to settle up net imbalances in their overall payments, either directly, or by entering the foreign-exchange market to support the exchange rate. If there is a tendency to imbalance in payments, the authorities have three choices: they can *adjust* by taking various actions designed directly or indirectly to affect the levels of payments and receipts; they can *borrow* by negotiating loans from foreign governments or individuals, or by adopting policies designed to encourage short-term capital inflows; and they can *finance* by drawing down their reserves.[5]

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holdings": some countries list holdings only of the central bank, others include exchange-equalization accounts, and still others include government holdings *in toto*. But these differences may reflect not arbitrary decisions as to what to report statistically but real institutional differences as to the ability of the monetary authorities to muster and utilize reserves held outside of the central bank. If that is the case, the lack of uniformity in reporting is appropriate. The definition of foreign exchange in the IMF's *International Financial Statistics*, which is the source of our data, is ". . . holdings by monetary authorities (central banks, currency boards, exchange stabilization funds, and Treasury holdings to the extent that treasuries perform similar functions) of bank deposits, Treasury bills, short and long-term government securities, and similar items when denominated in convertible currencies. In some cases . . . the data include holdings of government agencies other than the monetary authorities." (*IFS*, June 1967, p. 14.)

[3] The IMF Reserve Position is necessarily positive and represents the amount which a country may draw *unconditionally*, since it consists of the gold tranche plus the indebtedness of the IMF (generally the result of the Fund's having made use of the General Arrangements to Borrow).

[4] See Machlup (1966), pp. 2-3, for an excellent defense of this approach.

[5] These categories are analogous to, but not identical with, those established by Machlup (1965a) and Heller (1966). Machlup has three categories, real adjustment, which is the same as ours; compensatory corrections, an intermediate set of real or financial events, either happy accidents or restrictive direct controls, which eliminate the need for adjustment; and temporary financing, which is the sum of what I have labeled borrowing and financing. In our schema, there is no room for happy accidents (since we are concerned with policy measures taken to eliminate imbalances); as for direct controls, they are included in adjustment. Heller, on the other hand, has a simplified model in which there is either real adjustment or financing through the use of reserves.

II. WHY DO COUNTRIES NEED RESERVES?

We are considering official reserves, so the word "country" is used to denote the decision-making agencies, the monetary authorities, of the several countries. Three sources of the need for (and demand for) international money come to mind. First, analogously to the conventional notion of the transactions demand, is the need for international money to settle regular, recurring imbalances, as well as ". . . systematic and random fluctuations in current account receipts and payments."[6] The extent to which regular, seasonal, predictable imbalances will arise is largely a function of institutional arrangements. First, the nature of a country's export and import trade in particular and its payments and receipts structure in general will determine whether and how often periodic, and seasonal, imbalances arise. Second, the degree of development of the private foreign-exchange market will determine how much of the periodic imbalances are settled in the private sector and therefore how much remains to be settled by a drawing down of official reserves. To the extent, therefore, that a country does not have an efficient and highly developed money and foreign-exchange market, the authorities may feel the need to keep larger transactions balances than otherwise. On the other hand, the more centralized the government's control over the foreign-exchange market, the more able it will be to withhold licenses, postpone payments, and generally smooth out transactions in such a way as to avoid fluctuations rather than offset them by drawing down reserves. Yugoslavia, for example, has had the lowest ratio of reserves to imports of any member country of the IMF. Probably the most difficult situation is that of a country with relatively free foreign-exchange transactions but poorly developed banking and financial institutions.[7]

[6] Clower and Lipsey, p. 587. Machlup follows essentially the same approach (1966, p. 10). Heller (1968), in discussing the transactions demand for international money, deals with day-to-day transactions, but he relates these to *commercial banks'* holdings of foreign exchange, which is quite a different story. In his 1966 paper he similarly interprets transactions demand in terms of day-to-day transactions, but again, consistently, assumes that the monetary authorities do not hold transactions balances.

[7] One might argue, however, that the state of development of the foreign-exchange markets of one's trading partners is also important. Thus, a country with a poorly developed foreign-exchange market may have no trouble financing its imports in the foreign-exchange and money markets of its major supplier(s). In the empirical study, no attempt has been made to estimate this "good neighbor" effect. To the extent that it exists, it may help to explain the poor performance of

Second, in addition to demand for reserves for such short-term, seasonal needs, a country may wish to hold "precautionary" balances, to meet unexpected declines in earnings, due perhaps to war (at home or elsewhere), crop failures, sudden changes in capital movements, and similar exogenous disturbances.

We say a country *may* want precautionary balances. It is possible to argue that it should not hold such balances. For example, a report published by UNCTAD states the following (p. 12): "Most countries, whether developing or developed would wish, as an ideal, that reserves were sufficient in quantity to meet such fluctuations as might normally be expected in the light of their experience, while access to credit would handle contingencies whose scale and character could not be foreseen." One could, however, argue conversely. If a country has access to borrowed funds at relatively low rates in order to meet expected fluctuations, it may be rational to borrow extensively for such purposes. At the same time, it may be necessary or desirable to finance catastrophic or episodic shortfalls by drawing down owned reserves, since borrowing may be more difficult and costly in such situations; a country's creditworthiness is more likely to be questioned at times of sudden crisis than in the normal course of economic fluctuations.

Third, and perhaps most important for less developed countries, is the systematic, but somewhat irregular, fluctuation in earnings due to shifts in the demand for exports, affecting prices or quantities, or both. Whether reserves held to meet such contingencies should be labeled precautionary or transactions balances is not obvious. The answer depends on the degree of predictability of such fluctuations and also, heavily, on the kind of adjustment process that is posited. The adjustment mechanism determines not only the name we wish to assign to such balances, which is not particularly important, but also their appropriate level, which is important.

Consider three prototypical situations:

1. If a country considers its level of earnings for the next five or ten years to be known, and if it sets its expenditures equal to average earnings, then we can view the reserves as transactions holdings, their purpose being to smooth out the effects of year-to-year changes in earnings. The time horizon is longer than the one usually thought to

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the variable representing the size of the private foreign-exchange market. My thanks to Richard Caves for drawing attention to this point.

be relevant for transactions demand, but the principle is essentially the same. The required level of reserves will depend in this case on the cumulative negative deviation of earnings from their average. This is the prevalent model in discussions of the optimum level of reserves for LDC's.

2. If the policy decision is to adjust spending fairly quickly to changes in earnings (for example, with a one-year lag, so that expenditures are always equal to last year's receipts), a much smaller level of reserves will be adequate. This is the mechanism implied by Kenen and Yudin in explaining differences between the reserve fluctuations of developed and underdeveloped countries: "One would expect —and one finds—that the changes in reserves for . . . [the less developed] countries are more nearly random than those for the [developed] countries. . . . Most of the underdeveloped countries still use strict exchange controls and have small reserves. Any enduring payments disturbance is usually met by changes in direct controls, so that the monthly changes in reserves should be regarded as the consequences of imperfect synchronization in exchange control, rather than the measure of payments disturbances."[8]

3. At the other extreme, if the intention is to maintain spending at the existing level for as long as possible in the hope that any downturn in earnings will reverse itself eventually, the level of (precautionary) reserves that will be required must be very large indeed (in principle, infinite). This, by the way, is the implicit model which underlies much of the current discussion of the adequacy of reserves for the world as a whole.[9]

In this study I have applied, alternatively, the first two hypotheses. The demand for international money is considered to be dependent, *inter alia*, on two different measures of fluctuations in earnings. In one case, fluctuations are measured in terms of deviations from trend, which is consistent with the first type of adjustment mechanism. In the other case, fluctuations are measured as percentage year-to-year changes. The implications of these methods of measuring variability will be discussed in greater detail below. I have thus far been unable

[8] Kenen and Yudin, p. 244, footnote.

[9] One of many examples of this position (Harrod, p. 55) states: "Countries should be able to allow . . . imbalances to run on for a time, until further prospects become clearer and natural forces have had time to exert themselves. Other illustrations could be given from industrial countries in recent years, where reserve shortages have led countries to adopt restrictive or deflationary measures, although the deficits were likely to be ironed out in due course.

to devise a method of testing the proposition that some countries employ the first kind of adjustment mechanism and other countries the second kind; nor have I been able to test the hypothesis that there are changes over time with respect to the basic type of adjustment mechanism used.

Note that most statements about the adequacy of the international reserves of the developing countries assume that the first mechanism either is or ought to be the adjustment process and that LDC's *ought* to have adequate reserves to permit them to adopt such a policy. This is generally based on arguments about the high cost of frequent adjustment, particularly for developing countries, for whom adjustment often involves reducing the imports of goods required for development programs.

The third hypothesis, that of nonadjustment, is not testable within the framework of our model and with the type of data and method we have used. For that matter, it is probably not testable at all. Nevertheless, it is possible that it presents an accurate picture of the world, which may be the reason our results are so poor. In fact, I have argued elsewhere that the behavior of the developed countries, at any rate, is very close to that suggested by the nonadjustment model.[10]

[10] See Flanders (1969). Paradoxically, many (if not most) arguments about the adequacy of liquidity for the whole world are based on the third adjustment mechanism, as has been noted. Since the kinds of adjustment described there are generally thought to be those involving unemployment, deflation, and retardation of growth, stemming from macroeconomic policies generally pursued by the developed countries, it is presumably these countries that the authors have in mind when they argue, in effect, that countries should never have to adjust. The inequity of the established wisdom of the profession is revealed: LDC's should have enough reserves to enable them to adjust their imports to long-term trends; developed countries, on the other hand, should have enough reserves to enable them to go on forever without adjusting.

III. WHAT IS SPECIAL ABOUT THE LESS DEVELOPED COUNTRIES?

Alongside the discussion of the adequacy of international reserves and the need to reform the international monetary system has been the question of the adequacy of the reserves of the LDC's as a group. The arguments for increasing the reserves of the LDC's vary: some are essentially emotional arguments based on some notion of equity, others are pleas for increased reserves that are in fact based on income rather than liquidity considerations, still others stress the particular needs of the LDC's based on actual or assumed peculiarities of their trading patterns and economic structure.

Among the emotional arguments is the statement that the official plans for reform of the international monetary system are unfair in that the immediate and direct beneficiaries of these plans would be the developed, industrialized countries, that is, the rich. The usual reply to this is that increases in the stock of international money will redound to the benefit of the LDC's in the form of increased aid from rich to poor countries or increased willingness on the part of the rich to liberalize their trade as they find themselves freed of the balance-of-payments constraints imposed upon them by a worldwide shortage of reserves. This, in turn, is generally rejected by some champions of the LDC's as sophistry, analogous to the assertion of the rich man that his great wealth and income, by enabling him to give charity, benefit the poor. The issue further becomes deeply involved in a maze of political questions: if the mechanism for increasing international reserves becomes entangled with the arrangements for extending foreign aid to LDC's, will the developed countries accept the plan? If they do accept it, will there be a net increment to the total amount of aid granted to less developed countries, or will this simply substitute one form of aid-giving for another? We shall not pursue this matter here.[11]

[11] Machlup (1965b) discusses this question in considerable detail. Scitovsky 1966(a) has developed an ingenious positive-sum plan for increasing reserves by paying developed countries with unemployment and balance-of-payments deficits to produce goods which less developed countries want. Everybody gains: the developed countries get a stimulus to domestic employment plus financing of their payments deficit; the goods they give up in exchange have zero opportunity cost; the developing countries get additional resources. While the plan is not completely free of ethics, as Scitovsky claims, nevertheless it is based on an ethical proposition that is likely to be more generally acceptable than most of the other arguments. The usual ethical argument is: the rich countries should not be allowed

A number of statements on the need to relate international monetary reform to the LDC's involve the idea, as stated above, of an income transfer. Others simply take it as self-evident that LDC's need more reserves. In some cases this seems to stem from a confusion between liquidity and income problems. If a poor, underdeveloped country has a low income (and related to this, little cash), what it needs is more income, not more liquidity. The fact that over some time period imports are constrained by the level of exports—more precisely that payments are limited by receipts—is not a problem of inadequate reserves. That LDC's would like to spend more than they receive is probably true; but an explanation for the phenomenon must be sought either in the overall level of income, which is low, or in various institutional and economic phenomena which create imbalances between the propensity to import and the ability to earn foreign exchange. Lest I be accused of beating a dead horse and overstating the obvious, let me quote briefly one of many statements which fail to make this distinction clearly. The UNCTAD report of the Group of Experts states (p. 7):

> The flow of long-term capital and aid to developing countries has also been inadequate and has to a large extent merely offset the adverse effects of the trends in world trade. Apart from the moderate dimensions of such assistance . . . the total value (net of capital repayments) of grants, loans and equity capital flowing annually to the developing countries has remained unchanged since 1961: . . . the real equivalent of the aid forthcoming has fallen over this period. All this has not only affected economic growth in the developing countries but subjected their monetary reserves to acute pressure."

And again, because of the hard terms of much assistance ". . . soon after such aid is received, developing countries are confronted with serious problems of debt servicing and repayment accentuating the pressure on their balance of payments" (p. 9). I emphasize that I am attempting neither to deny the importance of these problems nor to defend the equity of the world distribution of income, but merely to separate two different issues.

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to get out of their balance-of-payments predicament without giving up something to the poor countries at the same time. Scitovsky's proposal states: in solving their payments problems, the rich countries ought to give the poor countries something which does not cost them anything anyway.

Where the income and reserves problems may merge is in a rather different arena. If it is true that the lack of adequate international reserves (for the world as a whole) is causing developed countries to have more serious balance-of-payments problems than they otherwise would, and if this in turn is leading to a reduction in the levels of development aid, then we can argue that the income problem is caused at least in part by the inadequacy of reserves. But if this is the case, increasing the reserves of the LDC's is not the answer. The appropriate remedy here, as Johnson, *inter alia*, suggests (Ch. VII) is to ease the payments problems of the developed countries by adopting a more expansionary institutional arrangement for determining the overall level of international money. In this context it is probably more important to see to it that reserves are *increasing* than that they attain any particular *level*.[12]

The assertion that LDC's have inadequate international reserves is usually (when not considered as simply self-evident) based on some or all of the following casually empirical statements:[13]

1. LDC's are in general more dependent on trade than the developed countries. They trade more, as a percentage of their gross national product (GNP), and changes in their exports have greater impact on their national income.

2. A high percentage of their exports consists of primary products. Primary products fluctuate in price more than industrial goods.

3. Their trade is more concentrated, that is, they export fewer different goods. The result of these three phenomena is that LDC's experience more severe fluctuations in trade and that these fluctuations have more serious effects on domestic income than is the case for the developed countries.

4. The imports of the LDC's are less compressible than those of the developed countries, that is, their imports are more necessary to sustain current income levels and more essential to further growth and development.

5. The LDC's have smaller reserves than the developed countries.

6. The reserves of the LDC's have been declining, or declining

[12] See Machlup (1966), Flanders (1969) for a discussion of the arguments leading to this conclusion.

[13] In many cases the statements about reserves are casual also in the sense that it is not clear whether one is talking about absolute levels of reserves or reserves in relation to some other magnitude, such as the level of trade. We shall return to this point in considerable detail.

more rapidly or rising less rapidly than those of the developed countries.

Let us consider these arguments in turn. The first three have been subjected to careful scrutiny by a number of investigators, notably MacBean, Coppock, Massell, and Michaely.

Regarding point 1, MacBean cites both Kuznets (pp. 89-107) and Michaely (Table 17) to the effect that there is no evidence that trade constitutes a higher proportion of output in underdeveloped than in developed countries. Michaely's figures indicate that the contrary may indeed be the case. He classifies countries into large and small (by population), developed and underdeveloped (by per capita annual income). For each country the average ratio of exports to GNP for the period 1950-56 is computed. Within each size classification the average ratio of exports to GNP is somewhat lower for underdeveloped than for developed countries. These differences are small, and as Michaely points out (p. 111) probably not significant, for a number of reasons. However, there is certainly no evidence from these figures that the usual presumption, of greater trade participation on the part of LDC's, is valid. Coppock (p. 85) ranks 80 countries according to their participation in trade (exports plus imports) as a percentage of GNP, and the top 30 countries include the following developed countries: Netherlands, Norway, Belgium-Luxembourg, Ireland, Denmark, Switzerland, Sweden, Austria. West Germany follows closely in thirty-third place.

Furthermore, Coppock finds a negative correlation coefficient, —.30, between foreign trade as a percentage of GNP and export instability (p. 86).

The one shred of mildly supportive evidence on this issue is a weak tendency, which Michaely finds (p. 111) for ". . . countries with a high degree of commodity concentration of exports—in distinction from underdeveloped countries . . . to have a high ratio of exports to the national product."

It is worth noting that even if proposition 1 were correct, it is not at all clear that increasing the reserves of the LDC's would remedy this situation. The argument that greater reserves would permit countries to smooth the effect on *income* of fluctuations in earnings rests on the assumption that domestic expansionary policies to counteract the multiplier effect of declining exports are constrained only by a shortage of foreign exchange. It is not difficult to adduce many other