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An Analysis of the Management of the Currency
Composition of Reserve Assets and External
Liabilities of Developing Countries

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Summary

Analyses of developing countries' financial positions have generally focused on the growth and currency composition of their reserve assets. The theory of portfolio selection, however, is clearly relevant to net positions rather than to assets alone. For this reason it is inappropriate to interpret changes in developing countries' net currency positions as having resulted from independent decisions concerning the currency composition of foreign exchange reserves and external debt. Such a decisionmaking process would be suboptimal and we see no reason to ascribe such behavior to the countries studied.

In this paper estimates of the currency composition of developing countries' foreign exchange reserves and external debt are presented and analyzed. Our interpretation of data on net positions suggests very different conclusions concerning the financial policies of developing countries, compared with conclusions based on reserve assets alone. In particular, the share of developing countries' foreign exchange reserves denominated in U.S. dollars varied over a narrow range in recent years and changes that occurred can be largely accounted for by fluctuations in dollar exchange rates. This finding, which is consistent with previous

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work in this area, 1/ is not maintained when net positions are examined. Net positions showed a substantial shift from 1974 to 1979 as the share of net liabilities denominated in U.S. dollars increased from 25 per cent to nearly 60 per cent.

Analysis of net positions of analytical subgroups of developing countries shows that this large shift toward net dollar liabilities for all developing countries did not result from changes over time in the preferences for dollar positions by the subgroups studied. For three of the five subgroups, shares of net positions denominated in U.S. dollars showed even less variation than was the case for shares of foreign exchange reserves denominated in dollars. Rather the shift toward net dollar liabilities resulted from changes in the relative size of financial positions of subgroups of developing countries that displayed different currency preferences throughout the period 1974 to 1979. Since data on the currency composition of reserve assets are not available for individual developing countries but only for country groups, this finding suggests that great care should be taken in drawing conclusions from aggregate data about a "typical" government's financial policies or currency preferences. Nevertheless, the fact that preferences vary across subgroups of countries suggests that changes in the structure of international reserve and debt holdings will continue to exert an important influence on the aggregate net currency positions of developing countries.

I. Introduction

The scale of international financial transactions of governments of developing countries has grown rapidly in recent years. Moreover, the greater variety of financial arrangements entered into by these governments, particularly transactions involving private credit markets, has generated fundamental changes in their financial positions. In this paper we present estimates of the size and currency denomination of international financial assets and liabilities for this diverse group of countries and for analytical subgroups over the 1974-1979 time period. Our main objective is to determine whether conclusions drawn from traditional analysis of the behavior of individual balance sheet items, such as the stock of foreign currency reserves, are maintained when management of these items is viewed as part of a more comprehensive financial strategy.

Analysis of overall balance sheet positions rather than individual items is based on the assumption that some objectives for financial management are met by manipulation of a number of different types of

1/ For an empirical analysis of the currency composition of foreign exchange reserves, see Heller and Knight (1978).

assets and liabilities. There would be little point in examining the interaction of balance sheet items in a world where each item was constrained by factors beyond the control of the government. If, for example, developing countries did not have access to private credit markets, so that currency composition of their debt was determined by official donors, and if these countries held reserve assets exclusively in the form of a key currency, the currency denomination of international reserves and debt positions would be independent of one another. It is roughly this institutional environment for which the traditional analysis of the financial management of these countries was developed.

In recent years institutional changes have increased the incentives, and have provided governments the means, to carry out more comprehensive management of their countries' financial positions. The variability of exchange rates among major currencies that has marked the floating rate period has certainly created strong incentives for more active management of the currency composition of both international reserves and foreign currency debt. Moreover, changes in oil and commodity prices and other shocks to the international economy have resulted in unprecedented growth in the size and variability of external assets and liabilities of oil-producing and other developing countries. Finally, the expansion of international credit markets has allowed developing countries greater flexibility in managing their international financial portfolios.

A better understanding of developing countries' adaptation to these circumstances would facilitate analysis of a number of policy issues. In an earlier paper by the author, ^{1/} it was shown that the financial policies of developing countries had generated substantial changes in the supplies of net official debt denominated in U.S. dollars and other major currencies. It was argued that this may have played a role in determining exchange rates among reserve currencies in recent years. Other policy issues for which the analysis presented in this paper might be important include the appropriate growth of international liquidity, the stability of a multi-currency reserve system, the role of the SDR and other reserve assets, and the role of private and official credit in the adjustment process.

Discussion of each of these questions depend in part on our understanding of how governments of developing countries have adapted their policies of financial management to changes in the international monetary system. We cannot begin to evaluate these policies until we have a clear idea as to which set of balance sheet items is manipulated by governments in order to meet their objectives. It should be noted that constraints on developing countries' financial policies undoubtedly continue to influence a variety of individual balance sheet items. However, as long as all positions are not constrained, optimal net positions can be attained by marginal adjustments of unconstrained financial assets and liabilities.

^{1/} Dooley (1982).

II. Portfolio Theory and Financial Management of Developing Countries

The financial management of governments can be analyzed using well-known principles of optimal portfolio selection. This theory posits that an individual decisionmaker, in this instance a government, attempts to manipulate his portfolio in order to maximize the expected utility of consumption over time. The utility, or desirability, of a portfolio depends on both the expected value of the financial assets and the variability of the value of the financial assets in terms of some basket of goods. Thus, a rational government would not put all of its wealth in one currency that has the highest expected yield, since this would, in general, imply a highly variable outcome for its wealth depending on how exchange rates actually change. This theory also suggests that countries producing or consuming different goods and services would optimally hold different portfolios of financial assets. ^{1/}

An application of portfolio theory to an analysis of developing countries' financial policies encounters several problems of measurement and interpretation. First, it is clear that predictions drawn from portfolio theory apply to net wealth positions. Changes in exchange rates affect the value of both financial assets and liabilities, and for this reason it is not sensible to evaluate separately holdings of reserve assets or official liabilities. Second, data on reserve assets and official liabilities do not encompass all important financial positions. Agreements to sell commodities forward or to purchase intermediate inputs are equivalent to financial assets and liabilities but are not included in the balance sheets we study. Third, the expected patterns of trade in goods and services that in part determine the demand for financial positions in different currencies, include not only relatively stable final consumption patterns but also receipts arising from exports and payments associated with the import of intermediate goods. For this reason it would not be surprising to find that currency preferences varied among groups of countries with different patterns of international trade. Moreover, changes in currency preferences over time for groups

^{1/} A theoretical and empirical literature has developed relating international asset demand to principles of expected utility maximization. Theoretical papers include Kouri (1976, 1977), Kouri and Macedo (1978), Frankel (1979), Krugman (1981) and Dornbusch (1982). Empirical work includes Roll and Solnik (1977), Cornell and Dietrich (1978), Kouri and Macedo (1978), Macedo (1980), Dornbusch (1980), Healy (1981) and von Furstenberg (1981). Asset demand functions derivable from expected utility maximization have been employed to estimate the effects of changes in the relative supplies of assets on exchange rates and rates of return. See Branson, Halttunen and Masson (1977), Frankel (1981), and Dooley and Isard (1982).



of similar countries must be interpreted cautiously and may be better explained by changes in the expected patterns of production and consumption than by changes in expected yields and covariances of financial assets denominated in various currencies. Finally, while the natural unit for analysis is an individual country, data on the currency composition of reserve assets are available only for groups of countries that are in some respects similar but that may have different preferences for the financial assets included in the balance sheets studied. To the extent that behavior is not uniform within a group of countries, changes in the compositions of the balance sheets studied might reflect changes in the relative size of the positions of different countries.

The primary objective of this paper is to evaluate the importance of the distinction between net and gross financial positions denominated in different currencies. It seems likely that the desired currency composition of reserve assets is largely independent of the optimal disposition of net wealth over currencies. For example, reserve assets denominated in U.S. dollars might be attractive because of the dollar's role as a "vehicle" currency in most foreign exchange market transactions. As for liabilities, it might be the case that some countries can issue debt denominated in a given currency on relatively favorable terms because of familiarity with financial institutions in the country whose currency is the denominator, the lending policies of international organizations such as the World Bank, or the policies of creditor countries that regulate access to their credit markets.

Although such considerations can be expected to influence the size of gross asset and liability positions in various currencies, it would, in general, be possible to attain a desired net position in each currency. The problem can be compared to a hedging strategy of a private firm engaged in international trade. Such a firm acquires asset and liability positions in foreign currency that expose the firm's net worth to exchange rate changes. It might be very costly to attempt to eliminate the exposure by constraining gross positions, for example, by limiting the liquid assets held in order to facilitate payments. The firm can, however, eliminate the exposure generated by its liquid assets by borrowing in the same currency or through a number of other financial arrangements. In this manner the net worth of the firm is protected while the advantages of holding gross asset or liability positions in different currencies are preserved.

A government faces essentially the same problem. It might want to protect its net worth, which depends upon its net position by currency. But it also is a "going concern" that holds liquid assets denominated in different currencies in order to facilitate expenditures and that faces a number of constraints on the currency denomination of debt issues. There are, of course, limitations to the process of transforming a portfolio in which gross positions are constrained so that net positions by currency are optimal. An obvious limitation is the fact that reserve and debt management are often not controlled by the same decisionmaker within the



government. As a working hypothesis, however, it may prove useful to interpret data for governments' net positions in different currencies as if they were able to obtain desired net positions.

One complication faced by most developing countries and nonfinancial firms in reaching their desired net positions is that the average maturity of financial assets is much shorter than for financial liabilities. In these circumstances the means available for adjusting net currency positions are to some extent constrained by the inability to alter the currency denomination of long-term debt. This is, however, just one of the many constraints on an individual balance sheet item that must be taken into account in managing net currency positions. In general, the objectives for net currency positions are not affected by the maturities of financial assets and liabilities. Although capital gains or losses resulting from changes in interest rates in assets and liabilities of different maturities may complicate hedging strategies, such gains and losses are unlikely to be systematically related to gains and losses related to exchange rate changes. The basic point remains, therefore, that exposure to exchange risk depends on stocks of assets and liabilities of all maturities.

The balance sheet items that can be manipulated at least cost will be determined by considerations that change over time and are largely unrelated to the factors determining the desired net position in each currency. For developing countries, the rapid growth of Eurocurrency credits in recent years may have provided an efficient vehicle for managing net currency positions. These credits are typically priced in terms of a spread over an interbank deposit interest rate. The borrower can normally choose to denominate the debt in a variety of major currencies or in several multicurrency baskets. Debt service payments need not be made in the currency in which the credit is denominated. The lender does not have a direct interest in which currency is chosen since it can fully cover its exchange and interest rate risk in the well-developed Eurocurrency deposit market. Thus, a country with a growing stock of Eurocurrency liabilities can conveniently manipulate its net position in different currencies by drawing credits denominated in a number of major foreign currencies.

III. Currency Composition of External Assets and Liabilities of 93 Developing Countries

The analysis in this section is largely descriptive, in that no model of portfolio behavior is tested. Nevertheless, two tentative conclusions seem warranted. First, the currency composition of reserve assets is not highly correlated with the currency composition of net positions of developing countries. This is the case both for the entire sample of countries and for analytical subgroups. This lack of correspondence calls into question analysis of the currency composition of

reserve assets based on the assumption that reserve assets taken by themselves are optimal portfolios. Second, the currency composition of net positions of various subgroups of developing countries is quite different throughout the sample period. As noted earlier, this finding is consistent with the fact that the subgroups studied have different expected patterns of receipts and payments for traded goods. By way of contrast, the net positions of subgroups of countries are relatively stable over the time period studied. It follows that the large shifts in the net currency positions for developing countries as a whole are due to changes in the composition of net financial positions among groups of countries with different currency preferences rather than changes in currency preferences of groups of similar countries over time.

Data for the combined balance sheets of developing countries is shown in Table 1. ^{1/} This data reveals little concerning the behavior of a "typical" government, since it is clear that there were large differences among individual countries with regard to the direction and size of changes in net positions. It does, however, provide a rough measure of the net impact this group of countries has had on the outstanding supplies of assets and liabilities denominated in various currencies. In the following section we will examine various subgroups of countries.

As shown in the top panel of Table 1, there were sizable shifts in the currency composition of developing countries' foreign exchange reserves over the six years for which we have data. A remarkable feature of the change in the share of dollar-denominated assets is that it closely mirrors changes in the dollar exchange value as measured by the SDR/\$ rate shown in the last column of Table 1. That is, if we held exchange rates at their 1974 levels and recalculated the shares shown in Table 1, there would be little change in the dollar share of the portfolio. Such a result would seem to suggest that this large group of countries on balance passively accepted changes in the share of assets denominated in different currencies resulting from changes in exchange rates. Such behavior would be difficult to reconcile with portfolio theory because it is unlikely that the preferences of this group of countries for currencies always coincided with exchange rate changes. ^{2/}

^{1/} Data on foreign-currency-denominated debt are from the World Bank Debtor Reporting System and include public debt, publicly-guaranteed debt, and a small amount of private external debt, all of which have original maturities of more than one year. Data on foreign currency reserve assets are from International Financial Statistics. The currency composition of foreign exchange is based on the Fund's currency survey and on estimates derived mainly, but not solely, from official national reports.

^{2/} It is, of course, true that exchange rates reflect all wealth holders' preferences for net positions in various currencies. It seems unlikely, however, that the preferences of this group of wealth holders would consistently correspond to changes generated by exchange rates.

Table 1. 93 Developing Countries

(End of Period)

<u>Year</u>	<u>Total</u> (Millions of \$'s)	<u>Per cent Denominated In:</u>						<u>Memo</u> <u>SDR/\$ (1974=100)</u>
		<u>US</u>	<u>DM</u>	<u>STG</u>	<u>FF</u>	<u>JY</u>	<u>Other</u>	
<u>Foreign Exchange Reserves</u>								
1974	67677	67	10	11	2	0	11	100
1975	72439	70	9	7	2	1	11	104.5
1976	89925	72	10	3	2	1	12	105.4
1977	107412	68	13	3	2	0	14	100.1
1978	106550	62	15	3	2	1	17	94.0
1979	128415	62	16	3	2	4	12	92.9

<u>Year</u>	<u>Total</u> (Millions of \$'s)	<u>Per cent Denominated In:</u>							
		<u>US</u>	<u>DM</u>	<u>STG</u>	<u>FF</u>	<u>JY</u>	<u>SF</u>	<u>Multi</u>	<u>Other</u>
<u>Foreign Currency Debt</u>									
1974	88446	50	9	9	4	4	1	11	12
1975	107320	52	9	8	4	4	1	11	12
1976	128358	56	7	7	4	4	1	11	11
1977	157532	58	7	6	4	4	1	10	10
1978	196980	57	8	5	4	5	1	9	10
1979	249705	55	9	4	4	7	1	9	10

<u>Year</u>	<u>Total</u> (Millions of \$'s)	<u>Per cent Denominated In:</u>					
		<u>US</u>	<u>DM</u>	<u>STG</u>	<u>FF</u>	<u>JY</u>	<u>Other</u>
<u>Net Foreign Currency Debt 1/</u>							
1974	20769	25	13	7	16	18	21
1975	34881	37	12	14	10	11	15
1976	38433	44	4	18	13	12	9
1977	50120	59	-1	14	10	14	5
1978	90430	65	2	9	8	12	5
1979	121290	58	5	7	8	12	10

1/ In order to account for the sizable share of multi-currency liabilities in the data, liabilities to individual currencies are allocated in a manner proportional to the actual shares for each currency for that year.



An alternative explanation is that reserve assets are held for transactions and precautionary reasons, and the currency composition of such assets is dominated by the consideration that they can be easily liquidated and used to make payments. Adjusting the currency mix of transactions balances following an exchange rate change might not be called for, particularly if nominal prices and payment patterns do not change along with exchange rates. Thus, a country with a given pattern of payments in, for example, U.S. dollars and deutsche marks might expect little change in the nominal level of those payments in each currency following a change in the dollar-mark exchange rate.

The middle panel of Table 1 shows estimates of size and currency composition of external debt for developing countries. The data show that external debt positions were larger and grew more rapidly as compared to reserve assets throughout the six-year period. Moreover, exchange rate changes did not dominate changes in the share of liabilities denominated in different currencies. In particular, the 10 per cent fall in the dollar's exchange value between 1976 and 1978 was associated with a one per cent rise in the share of dollar-denominated liabilities for this group of countries.

The evolution of net positions in various currencies is shown in the bottom panel of Table 1. ^{1/} The very different appearance of the information in this part of the table serves as a reminder that when assets and liabilities are growing at different rates, inspection of data on either assets or liabilities alone is likely to give a misleading picture of changes in net positions.

A striking feature of these data is the very large shift toward net dollar-denominated liabilities from 1974 to 1978. It follows that investors other than developing country governments absorbed a substantial net supply of dollar-denominated debt issued by the governments of developing countries. As opposed to the picture of financial management for developing countries that emerges from an inspection of reserve asset data, we would conclude from these more comprehensive measures that the combined actions of this diverse group of governments has resulted in a substantial shift away from net dollar asset positions.

The share of net liabilities denominated in deutsche marks fell rapidly from 1974 to 1977 as the share of reserve assets denominated in marks increased and the share of liabilities denominated in marks fell. The 14 per cent fall in the deutsche mark's share of net liabilities

^{1/} In order to account for the sizable share of multi-currency liabilities in the data we allocated these liabilities to individual currencies in a manner proportional to the actual shares for each currency for that year.

over this three-year period is consistent with efforts of many governments to increase the share of their net wealth denominated in marks in the early years of the floating rate system. If we look only at reserve assets this trend continues in 1978 and 1979. However, the share of mark-denominated liabilities increased after 1977, more than offsetting the continued buildup of reserve assets and, by 1979, reversing about half of the early fall in net mark liabilities.

The behavior of net positions denominated in pound sterling is also quite interesting. The share of net liabilities denominated in sterling rose rapidly from 1974 to 1976 as the decline in sterling-denominated liabilities was overwhelmed by a rapid decline in sterling-denominated reserve assets. However, after 1976 the continued decline in the share of sterling liabilities was accompanied by an unchanged share of sterling assets, so that by 1979 the net position in sterling had returned to its 1974 level.

The French franc presents another picture. In this case the share of both franc-denominated assets and liabilities remained unchanged during the entire sample period. However, because the share of liabilities denominated in francs exceeded the share of assets denominated in francs, and because liabilities grew more rapidly than assets, the net liability position in francs fell throughout the sample period.

Finally, net liabilities denominated in yen were quite small and their share in total net liabilities changed little after 1975, in spite of a fairly rapid increase in both assets and liabilities during 1978 and 1979.

IV. Currency Composition of External Assets and Liabilities of Analytical Subgroups of Developing Countries

In order to examine the external financial policies of groups of countries that are in some respects similar, Tables 2-6 show foreign currency assets, liabilities and net positions for analytical subgroups. A full discussion of the recent experience of these groups of developing countries can be found in the World Economic Outlook. ^{1/}

Detailed discussion of gross asset and liability positions is limited to only two groups of countries because such discussion is not helpful in understanding the evolution of net positions over time. In a mechanical

^{1/} See International Monetary Fund (1981) pp. 108-109 for a list of countries and a brief discussion of the subgroups discussed in this section.

Table 2. Major Oil Exporters

Year	Total (Millions in \$'s)	Per cent Denominated In:					
		US	DM	STG	FF	JY	Other
<u>Foreign Exchange Reserves</u>							
1974	39488	76	4	15	0	0	3
1975	46875	77	6	8	2	1	7
1976	52330	78	8	4	1	1	8
1977	59780	72	12	2	2	0	11
1978	44901	67	15	2	2	1	12
1979	59870	68	16	2	2	4	8

Year	Total (Millions in \$'s)	Per cent Denominated In:							
		US	DM	STG	FF	JY	SF	Multi	Other
<u>Foreign Currency Debt</u>									
1974	7895	47	6	5	10	0	1	13	17
1975	8103	43	5	6	11	0	1	13	20
1976	9138	44	4	5	10	0	0	17	20
1977	11128	47	4	5	10	1	0	15	19
1978	15619	47	8	4	10	5	1	11	16
1979	21405	45	10	3	9	9	1	8	14

Year	Total (Millions in \$'s)	Per cent Denominated In:					
		US	DM	STG	FF	JY	Other
<u>Net Foreign Currency Assets 1/</u>							
1974	31593	81	4	18	-2	0	0
1975	38773	82	6	7	0	1	4
1976	43192	83	9	3	-1	1	5
1977	48652	75	14	2	0	0	9
1978	29282	75	18	1	-2	-1	9
1979	38465	78	18	1	-2	1	4

1/ In order to account for the sizable share of multi-currency liabilities in the data, liabilities to individual currencies are allocated in a manner proportional to the actual shares for each currency for that year.

Table 3. Middle Income Net Oil Importers

Year	Total (Millions in \$'s)	Per cent Denominated In:					
		US	DM	STG	FF	JY	Other
<u>Foreign Exchange Reserves</u>							
1974	8912	54	24	5	3	0	13
1975	8695	57	20	4	3	0	15
1976	10883	62	20	2	2	1	13
1977	12218	59	20	2	2	2	14
1978	16027	53	23	3	4	2	16
1979	18702	53	24	4	2	5	12

Year	Total (Millions in \$'s)	Per cent Denominated In:							
		US	DM	STG	FF	JY	SF	Multi	Other
<u>Foreign Currency Debt</u>									
1974	31463	60	8	4	4	2	1	12	8
1975	42032	63	7	4	4	2	1	11	7
1976	52250	66	6	3	3	3	1	11	7
1977	65592	67	6	3	3	3	1	10	7
1978	82501	65	8	3	3	4	1	10	7
1979	105494	63	9	2	3	5	2	8	7

Year	Total (Millions in \$'s)	Per cent Denominated In:					
		US	DM	STG	FF	JY	Other
<u>Net Foreign Currency Debt 1/</u>							
1974	22551	75	4	6	5	3	7
1975	33337	76	5	5	4	3	6
1976	41367	78	3	4	4	4	6
1977	53373	79	4	3	3	4	6
1978	66475	77	5	3	3	5	7
1979	86792	73	6	2	4	6	8

1/ In order to account for the sizable share of multi-currency liabilities in the data, liabilities to individual currencies are allocated in a manner proportional to the actual shares for each currency for that year.

Table 4. Low Income Countries

Year	Total (Millions in \$'s)	Per cent Denominated In:					
		US	DM	STG	FF	JY	Other
<u>Foreign Exchange Reserves</u>							
1974	2517	45	20	17	9	0	9
1975	2397	49	18	13	10	0	9
1976	4607	63	14	6	7	0	11
1977	7430	57	14	11	4	0	14
1978	8325	51	17	11	5	0	16
1979	9365	43	17	14	5	11	10

Year	Total (Millions in \$'s)	Per cent Denominated In:							
		US	DM	STG	FF	JY	SF	Multi	Other
<u>Foreign Currency Debt</u>									
1974	22504	33	10	23	4	5	1	11	14
1975	25621	33	11	22	5	4	1	10	15
1976	28324	37	10	19	5	4	1	10	15
1977	32246	39	10	17	5	4	1	9	15
1978	38021	38	10	16	6	5	1	9	15
1979	45195	39	10	14	7	5	1	8	15

Year	Total (Millions in \$'s)	Per cent Denominated In:					
		US	DM	STG	FF	JY	Other
<u>Net Foreign Currency Assets 1/</u>							
1974	19987	36	11	27	4	6	15
1975	23223	37	11	26	5	5	16
1976	23717	37	10	25	6	5	17
1977	24816	39	10	22	7	6	17
1978	29695	40	9	20	7	7	17
1979	35829	43	9	16	8	5	19

1/ In order to account for the sizable share of multi-currency liabilities in the data, these liabilities to individual currencies are allocated in a manner proportional to the actual shares for each currency for that year.

Table 5. Manufacturing Exporters

Year	Total (Millions in \$'s)	Per cent Denominated In:					
		US	DM	STG	FF	JY	Other
<u>Foreign Exchange Reserves</u>							
1974	11880	50	14	3	1	0	31
1975	9609	56	11	5	0	0	27
1976	15697	63	9	2	0	1	26
1977	19884	65	12	2	0	0	21
1978	28110	61	11	2	0	0	26
1979	28924	64	12	2	1	2	20

Year	Total (Millions in \$'s)	Per cent Denominated In:							
		US	DM	STG	FF	JY	SF	Multi	Other
<u>External Debt</u>									
1974	12313	49	10	3	3	9	1	9	17
1975	14680	52	11	2	3	8	1	9	15
1976	18092	56	9	2	4	8	1	9	11
1977	22091	56	10	2	4	8	1	9	11
1978	26750	54	10	2	4	9	1	9	11
1979	32660	51	11	2	4	11	1	10	10

Year	Total (Millions in \$'s)	Per cent Denominated In:					
		US	DM	STG	FF	JY	Other
<u>Net Foreign Currency Debt 1/</u>							
1974	433	170	-54	10	49	280	-354
1975	5071	60	14	-2	8	27	-7
1976	2395	59	22	5	29	62	-78
1977	2207	35	7	3	41	90	-76
1978	-1360	65	15	-3	-83	-195	302
1979	3736	7	21	-1	35	94	-55

1/ In order to account for the sizable share of multi-currency liabilities in the data, liabilities to individual currencies are allocated in a manner proportional to the actual shares for each currency for that year.



Table 6. Net Oil Exporters

Year	Total (Millions in \$'s)	Per cent Denominated In:					
		US	DM	STG	FF	JY	Other
<u>Foreign Exchange Reserves</u>							
1973	4880	64	10	7	5	0	15
1974	4862	68	8	4	4	0	16
1975	6408	70	9	2	3	0	16
1976	8100	73	9	1	1	0	15
1977	9187	67	11	1	2	1	18
1978	11554	63	13	2	2	3	16
1979	15000	63	13	2	2	3	16

Year	Total (Millions in \$'s)	Per cent Denominated In:							
		US	DM	STG	FF	JY	SF	Multi	Other
<u>External Debt</u>									
1974	14270	55	9	2	4	3	1	13	13
1975	16884	57	8	2	4	4	1	12	11
1976	20553	62	7	2	3	4	0	12	10
1977	26475	65	7	2	3	4	0	11	9
1978	34089	64	6	2	3	6	1	9	9
1979	44952	59	9	2	3	8	1	9	9

Year	Total (Millions in \$'s)	Per cent Denominated In:					
		US	DM	STG	FF	JY	Other
<u>Net Foreign Currency Debt 1/</u>							
1974	9391	64	10	1	5	6	14
1975	12022	66	11	2	4	6	11
1976	14145	72	8	2	4	7	7
1977	18375	74	7	2	4	6	7
1978	24902	74	5	2	4	9	6
1979	33398	67	9	2	4	12	7

1/ In order to account for the sizable share of multi-currency liabilities in the data, liabilities to individual currencies are allocated in a manner proportional to the actual shares for each currency for that year.

sense the difficulty is that the evolution of net positions depends upon the levels and growth rates of both shares and amounts of assets and liabilities denominated in different currencies. The economic interpretation of this is that the rational management of the currency denominations of net positions need not result in consistent patterns over time for either assets or liabilities. For example, a financial strategy to reduce the share of net worth denominated in dollars might call for a reduction in the share of reserve assets denominated in dollars in one time period but an increase in level of liabilities denominated in dollars in the next time period.

The behavior of foreign currency reserves of developing countries that are major oil exporters is marked by rapid growth and substantial changes in currency denomination (Table 2). The dollar share of the asset portfolio fell sharply after 1976, following closely the decline in the exchange value of the dollar. The rise throughout the period in the share of mark- and yen-denominated assets and the decline in sterling-denominated assets reflects both valuation changes and a redistribution of portfolios among the non-dollar currencies. In general, this data taken by itself would suggest active management of the non-dollar part of the portfolio, but a passive policy toward changes in the dollar share of the portfolio.

However, when the information on external debt (shown in the middle panel) is taken into account, these conclusions are substantially affected. Perhaps the most interesting feature of the debt data is the relatively low share of dollar-denominated liabilities issued by these countries throughout the sample period. As the growth of liabilities accelerated after 1976, the practice of denominating less than half of these liabilities in dollars acted as an important offset to the decline in the share of dollar assets discussed above. Thus, while the share of gross assets denominated in dollars, shown in the top panel, declined by 10 per cent from 1976 to 1979, the share of net assets denominated in dollars fell by only 5 per cent, considerably less than the fall in the dollar's exchange value over the period. One interpretation of this data is that as the dollar's exchange value fell after 1976, this group of countries "rebalanced" their portfolio by issuing non-dollar liabilities rather than substituting dollar for non-dollar reserve assets. Such a strategy may also account for the fact that the very large change in the relative share of mark and sterling assets was even more pronounced in the net asset position, shown in the bottom panel of Table 2. However, the fairly sharp increase in the share of yen-denominated assets in 1979 was largely offset by increases in yen liabilities.

The foreign currency debt of "middle income" developing countries that are net oil importers accounted for about half the total for all developing countries (Table 3). The currency composition of both assets and liabilities of this group of countries showed less variability than that of the major oil exporters over the six-year period. An exception was the fairly large increase in the dollar share of reserve assets from 1974-1976, which, however, was completely reversed by 1979. The share of net liabilities denominated in dollars was quite stable over the period and was virtually unchanged in 1979 as compared to 1974.

The stability of this group's net liability position during a time of very large exchange rate changes and a three-fold increase in their foreign currency debt is consistent with the view that net positions are managed in order to maintain a desired net portfolio allocation. The fact that these countries have held about three-quarters of their net debt in dollar-denominated positions would indicate a fairly strong preference for maintaining a predictable stream of dollar payments. The concentration of net liabilities in dollars would also suggest that these countries' net worth position are unusually sensitive to changes in dollar exchange rates and interest rates.

Data for low-income countries (Table 4) show a much different portfolio as compared to the two groups discussed above. The dominant difference is the comparatively low share of dollar-denominated net debt. With the exception of a significant decline in the share of net liabilities denominated in pound sterling, these countries' policies have also resulted in a remarkably stable balance sheet. It would also appear that this group prefers a more diversified portfolio than do the other groups.

Data for manufacturing exporters (Table 5) indicate that these countries have maintained a roughly balanced position in total assets and liabilities, so that their net liability or asset position has remained small. The net position by currency has been quite erratic and shows no particular trend. Finally, the group of net oil exporters (Table 6) shows an unusual pattern in that the net liability position denominated in dollars rose from 1974 to 1978 to about the level prevailing for other "middle income" countries, but fell sharply in 1979 as liabilities denominated in marks and yen increased.

V. Future Research

In this paper we have only begun to draw conclusions from a comprehensive approach to analyzing the financial management of developing countries. It has been shown that changes in the currency composition of reserve assets of developing countries as a group, and for several analytical subgroups, are not reliable guides to the behavior of net financial positions in various currencies. In several instances, inferences drawn from analysis of assets alone are significantly modified or reversed by more careful analysis of net positions.

A topic for further research is the possibility that tests of propositions drawn from portfolio theory concerning the optimal size of reserve asset holdings might also be materially affected by a more comprehensive evaluation of assets and liabilities. It seems likely that the growth of Eurocurrency credits and lines of credit also influenced the gross stock of reserve assets held by developing countries. An unconditional line of credit may be a good substitute for a liquid asset. Since most non-oil developing countries are net debtors, their international reserves are financed by external liabilities. The cost of carrying such reserve assets is the difference between the government's marginal borrowing rate and the rate of return on their reserve assets. If, as is sometimes the case, the commitment fee for a line of credit is less than this differential, it might be rational to hold only a very small transactions balance in the form of reserve assets. The difficulty in testing this hypothesis is in measuring a government's access to credit. The amount or maturity structure of the stock of a country's debt is probably of little help in constructing such a measure. ^{1/} This line of argument suggests that an analysis of the demand for growth reserve assets should consider measures of off-balance-sheet agreements that ensure a government's access to credit on prearranged terms.

^{1/} See Eaton and Girsovitz (1981) for a discussion of possible linkages between external debt and gross international reserves.

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