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Chapter Author: Millard F. Long

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External Debt and the Trade Imperative in Latin America

Millard F. Long

Since 1973 there have been repeated shocks of unprecedented magnitude in world trade. The increases in the price of oil have attracted the most attention, but other shocks have been significant as well. To illustrate, in the space of 24 hours on January 22, 1980, the price of copper declined by more than 10 percent and that of silver by 25 percent. These are extraordinarily large price movements even in today's volatile markets. But many less developed countries have since 1972 experienced annual swings in their terms of trade of 10 percent or more. For a typical LDC which has a current account deficit equal to 2 percent of GNP and imports equal to 20 percent of GNP, a 10 percent swing in the terms of trade will eliminate or double the current account deficit. Price disturbances have been the source of the most important external shocks in recent years, but the trade and debt problems of the developing countries have been exacerbated by the slowdown in export growth, the rise in nominal interest payments and the need to add to reserves in an inflationary environment. These four factors are largely responsible for the unprecedented growth in the external debt of the LDCs. Between 1972, the last year for which trade conditions can be considered "normal," and 1978, the external debt of the LDCs tripled; for the countries of Latin America and the Caribbean, the increase was fourfold. For Brazil, Peru, and Venezuela, external debt was up 500 percent; for Mexico, 600 percent.

Concern is again being expressed about the size of certain countries' external debts and in particular about the fraction of the debt owed to commercial banks. There can be no doubt that the debt is up substantially, but the question is whether it has now reached "dangerous" levels in some countries. This paper makes no attempt to provide an up-to-date country risk assessment. It should be viewed as one input into the factual analysis of external debt for several Latin-American countries, while at the same time attempting to deal with some of the more analytical issues. To the extent possible the analysis is carried out

for the aggregate of non-oil countries of Latin America and the Caribbean and separately for seven major countries: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela. In terms of debt outstanding from commercial banks at the end of 1978, these countries ranked fifth, first, tenth, twelfth, second, ninth, and third among all developing countries. Of loans to LDCs from all sources, these seven countries accounted for one-third of the total.

EXTERNAL DEBT

The Nominal Value of Debt

For most of the less developed countries, it is impossible to make an accurate estimate of their outstanding external debt, let alone construct a time-series. The World Bank reproduces figures reported by the countries on government and government-guaranteed debts of more than one year. The Bank for International Settlements (BIS) reproduces figures on loans to the LDCs reported by the commercial banks in the Group of Ten countries plus Switzerland. The World Bank figures exclude all short-term debts and long-term debts not guaranteed by the government. In the case of the Latin-American countries under review, the unreported debt is a substantial portion of the total. The BIS figures cover short and long debts, but only to banks headquartered in certain countries. Only US banks report loans from their offshore subsidiaries. BIS officials have said that bank loans to LDCs probably exceed their published estimates by \$5 to \$10 billion. In addition, suppliers' credits are only covered in part and there is no information at all on government-to-government obligations for financing military purchases. Furthermore, in recent years, countries such as Indonesia, Turkey, and Venezuela have made substantial upward adjustments in the estimates of their outstanding debts. Thus the figures reported may, for several of the countries, underestimate the level of debt, but how a more complete statement would affect the trend in debt growth is anyone's guess.

Table 1 reports the value of the external debt of the Latin-American and Caribbean¹ countries from 1972 through 1978 using the World Bank definition of debt. For the years from 1974 through 1978 it is possible to augment the World Bank estimate to include the nonguaranteed portion of the private debt coming from commercial banks. To do this we have subtracted out the loans from financial institutions as reported to the World Bank and added the loans from banks reported by the BIS.² This procedure is imperfect, but it gives a more realistic picture of the countries' total external debts.³

Whether one chooses the World Bank estimates or the augmented estimates, it is clear that the nominal value of the outstanding debt has grown very rapidly. Only for Chile and Colombia have the external debts grown by less than 100 percent between 1972 and 1978. For the other five countries, and for the continent as a whole, the debt has risen at least fourfold in this six-year span. To some degree any statement on aggregated debts is a sum of dissimilar

Table 1
EXTERNAL DEBT OF THE LESS DEVELOPED COUNTRIES 1972-78 (billions US \$)

	1972		1973		1974		1975		1976		1977		1978	
	WB	AUG.	WB	AUG.	WB	AUG.	WB	AUG.	WB	AUG.	WB	AUG.	WB	AUG.
All developing countries	74.3	90.5	116.3	135.6	133.2	182.5	164.3	232.1	204.5	271.0	256.7	348.3		
Non-oil countries	62.1	74.1	92.5	115.6	112.6	154.9	138.2	194.4	169.9	219.8	210.1	273.4		
All Latin-American countries	21.5	26.5	34.9	46.4	43.0	70.6	56.1	89.2	69.7	103.5	90.1	133.2		
Non-oil Latin America	19.6	24.5	33.0	43.8	41.1	66.0	52.4	81.1	63.9	91.9	81.2	114.9		
Argentina	2.4	2.8	3.1	4.3	2.8	5.6	4.3	6.1	4.8	7.4	6.2	10.7		
Brazil	5.2	6.7	9.4	13.1	12.3	20.1	15.9	27.8	19.2	31.6	27.2	43.5		
Chile	2.6	2.8	3.8	3.9	3.7	4.0	3.6	4.3	3.5	4.2	4.4	5.5		
Colombia	1.6	1.9	2.1	2.8	2.3	3.5	2.5	3.7	2.7	3.8	2.8	4.3		
Mexico	4.0	5.4	8.1	9.0	11.3	16.9	15.6	21.7	20.3	24.7	24.8	29.8		
Peru	1.0	1.4	2.2	2.4	3.0	3.9	3.7	4.7	4.7	5.5	5.4	6.6		
Venezuela	1.4	1.5	1.5	2.3	1.3	3.9	3.0	7.1	4.4	9.5	6.9	15.1		

Sources: WB = World Bank figures, World Debt Tables, 1979; Aug. = World Bank figures augmented as explained with information from the Bank for International Settlements, various publications.

objects — an IDA loan at low interest rates made for 40 years with a grace period on repayment is not equivalent in present value to a commercial bank loan for five years at floating rates with no grace period. But the countries of Latin America receive relatively little concessional debt; in fact, at the end of 1978, 70 percent of all outstanding loans were from commercial banks. Because of the difference in terms, there is a problem when comparing India's debt with that of Brazil, but much less of a problem when comparing the debt of the countries of Latin America either cross-sectionally or over time.

The Real Value of Debt

Of course, one important reason that the nominal value of the outstanding debt has increased is inflation. How much has the debt of the Latin-American countries increased in real terms? This simple question has no simple answer [4].

In any inflationary period, and in particular in the years since 1972, there have been substantial changes in relative as well as absolute prices. Different price indexes show different rates of price change. Thus debt deflated by one price index will show different real growth than the debt deflated by another index. It is often unclear which price index is the appropriate deflator. In deflating the nominal value of real goods, one is attempting to measure the underlying change in the quantities produced of particular goods. But financial assets represent generalized purchasing power that could be used to purchase any basket of goods. Prices refer to goods, and it is not clear what basket of goods should be associated with particular financial assets. There is a second complication: the typical LDC is not going to repay its external debt today by expanding its exports or curtailing its imports. Therefore, it is not very meaningful to state that the real value of the external debt of a copper-exporting country rose today by 10 percent because the price of copper fell by 10 percent. Rather one is interested in how the rise in prices will over the long run affect the amount of resources needed to service the debt. Furthermore, any measure of the real value of debt is a hypothetical concept; it may be useful to employ different deflators to assess changes in real values as viewed from different perspectives, say, debtors' and creditors'.

The usual solution to this problem is to deflate external debt by an index of import or export prices of the developing countries as a group. Because these prices rose rapidly in the years 1973 and 1974, a comparison of the 1972 with the 1978 debt attributes a very substantial fraction of the growth to inflation. But import and export price indexes measure the relative price changes of traded goods as well as the overall price changes. Alternatively one can deflate the debt by a more broadly based price index on the assumption that over the longer run changes in most relative prices will even out. If that position proves correct, a better long-run measure of changes in the quantities of imports or

Table 2

REAL EXTERNAL DEBT OF THE LESS DEVELOPED COUNTRIES 1972-78 (1978 prices, billions US \$)

	1972		1973		1974		1975		1976		1977		1978	
	MB	WB	MB	WB	MB	WB	MB	WB	MB	WB	MB	WB	MB	WB
All developing countries	123.8	140.3	160.4	187.0	165.7	227.0	189.3	267.4	218.5	289.3	256.7	348.3		
Non-oil countries	103.5	114.9	127.6	159.4	140.0	192.6	159.2	224.0	181.5	234.8	210.1	273.4		
All Latin-American countries	35.8	41.1	48.1	64.0	53.5	87.8	64.6	102.8	74.5	110.6	90.1	133.2		
Non-oil Latin-American countries	32.7	38.0	45.5	60.4	51.1	82.1	60.4	94.4	68.3	98.2	81.2	114.9		
Argentina	4.0	4.3	4.3	5.9	3.5	7.0	4.9	7.0	5.1	7.9	6.2	10.7		
Brazil	8.7	10.4	13.0	18.0	15.3	25.0	18.3	32.0	20.5	33.8	27.2	43.5		
Chile	4.3	4.3	5.2	5.4	4.6	5.0	4.1	4.9	3.7	4.5	4.4	5.5		
Colombia	2.7	2.9	2.9	3.9	2.9	4.3	2.9	4.3	2.9	4.0	2.8	4.3		
Mexico	6.7	8.4	11.2	12.4	14.0	21.0	18.0	25.0	21.7	26.4	24.8	29.8		
Peru	1.7	2.2	3.0	3.3	3.7	4.8	4.3	5.4	5.0	5.9	5.4	6.6		
Venezuela	2.3	2.3	2.1	3.2	1.6	4.8	3.4	8.2	4.7	10.1	6.9	15.1		

Sources: See Table 1; Deflator - IMF Industrial Countries Consumer Goods Price Index in International Financial Statistics.

exports needed to service the debt will be given by debt figures deflated by the more broadly based price index. In practice one can raise objections to all of the available price indexes as debt deflators. Perhaps the most broadly based of available indexes is the IMF's measure of consumer price changes in industrial countries. Using this index as deflator, the nominal debt has been expressed in real terms in Table 2. This table indicates that in real terms the outstanding debt of the less developed countries doubled between 1972 and 1978; for the Latin-American countries as a whole it was up 2.5 times, for Mexico almost four times.

Confirmation of the increase in real debt can be obtained in another way, though the alternative approach is not unproblematic. Table 3 shows, for the seven countries under consideration, the growth in the ratio of augmented nominal debt less reserves to nominal GNP⁴ from 1974 through 1978. For Chile the level of external debt was already very high in 1974 and has not increased in the last four years. For Colombia as well, the debt-to-GNP ratio has remained roughly constant. But for the other five countries the increase has been substantial. This type of ratio begins to give some indication about another question of interest: that is, is the existing debt too heavy and should the creditors and the countries themselves be concerned about its size? I shall return to this issue later.

The Net Value of Debt

I now turn to yet one more concept of debt—net debt. Traditionally we conceive of countries borrowing because their imports exceed their exports. But that notion is oversimplified. Some of the borrowed funds are used to enhance official reserves; other funds are used by the private sector to acquire financial assets abroad. If all borrowings by LDCs from commercial banks were simply redeposited in commercial banks net debt would be zero and there would be little cause for concern. In fact, that is the case for the aggregate of non-oil less developed countries outside of Latin America. For these countries as a group deposits in commercial banks are equal to outstanding loans. Of course some countries are net borrowers, others net creditors. The gross liabilities at the end of June 1979 of the non-oil countries to commercial banks were \$143 billion, the liabilities net of deposits were only \$46 billion. For Latin America, the gross liabilities were \$103 billion; the net \$59 billion.

Several problems exist with assessing the net debt. Some of the bank deposits are presently credited to Swiss and other developed country trust accounts, but are really owned by individuals and possibly LDC governments. In addition some privately owned external financial assets are held in forms other than bank deposits and are not included in the BIS data. With regard to a country's official reserves some are in the form of bank deposits, others in such assets as US Treasury securities. Reserve figures are not reported in a way that allows one to judge the degree of overlap between the reserve figures and the bank

Table 3

DEBT RATIOS

Net interest and dividends/exports

	1972	1973	1974	1975	1976	1977	1978
All Latin America	.13	.13	.10	.12	.11	.13	.15
Argentina	.24	.21	.21	.27	.19	.09	.10
Brazil	.12	.11	.10	.18	.20	.19	.24
Chile	.15	.08	.11	.16	.15	.14	.14
Colombia	.16	.14	.10	.12	.10	.08	.07
Mexico	.19	.21	.23	.29	.31	.29	.27
Peru	.10	.12	.09	.14	.21	.19	.23
Venezuela	.14	.16	.05	.01	... ^a	.02	.04
Net augmented debt ^b /GNP							
Argentina			.08	.13	.11	.09	.11
Brazil			.07	.12	.14	.15	.17
Chile			.35	.37	.34	.29	.29
Colombia			.18	.20	.16	.11	.09
Mexico			.14	.24	.30	.31	.33
Peru			.16	.33	.39	.44	.50
Venezuela			-.16 ^c	-.16 ^c	-.03 ^c	.05	.22

^aNet interest payments were positive.^bNet augmented debt = augmented debt-official reserves.^cReported net augmented debt was negative.

deposits recorded by the BIS; thus one cannot estimate a composite total of reserves plus nonreserve bank deposits. Lastly, even if we knew the figures, we would still be in a quandary as to how to treat private holdings of foreign assets. One individual or firm in Brazil may hold dollar balances, another dollar debts. Will the one's assets be available to pay the other's liabilities? Clearly one needs to know more about the distribution of foreign liabilities and assets before netting out.

Table 4 gives the World Bank debt figures net of official reserves, and the augmented debt figures net of reported deposits in foreign commercial banks. For the LDCs as a group netting out bank deposits reduces the external debt by half; for the non-oil countries the reduction is more than one-third. In the case of Latin America, for all countries netting reduces debt by one-third, only about one quarter for non-oil countries. Whether we subtract reserves from official debt, or bank deposits from total debt, the effect of netting is most marked in the case of Venezuela, least in the case of Peru. In the case of Argentina and Brazil, it is clear that the nonguaranteed component of the external debt is large; but it would also appear that the private sector in both countries holds large deposits in overseas commercial banks.

Table 4

EXTERNAL DEBT NET OF FOREIGN ASSET HOLDINGS 1972-78 (billions US \$)

	World Bank debt less official reserves					Augmented debt less bank deposits						
	1972	1973	1974	1975	1976	1977	1978	1974	1975	1976	1977	1978
All developing countries	49.8	59.7	54.1	64.6	76.3	104.9	166.5	58.6	84.6	106.2	117.9	175.2
Non-oil countries	45.9	53.5	62.2	83.8	98.8	123.5	156.8	70.3	100.2	122.2	132.9	174.8
All Latin-America countries	14.4	16.7	22.4	29.7	38.4	49.6	68.3	25.1	45.0	58.7	68.6	90.2
Non-oil countries	13.5	16.0	25.2	34.3	41.4	50.1	63.9	27.8	47.8	58.1	65.9	82.1
Argentina	2.1	1.9	2.0	2.5	2.9	1.7	1.2	2.5	3.6	3.0	3.1	6.0
Brazil	1.7	1.7	4.2	8.3	9.4	12.0	15.4	8.5	16.1	21.0	25.3	32.8
Chile	2.5	2.7	3.4	3.6	3.2	3.1	3.3	3.4	3.5	3.6	3.4	4.1
Colombia	1.3	1.5	1.7	1.8	1.4	1.0	0.4	2.4	2.9	2.8	2.5	2.3
Mexico	3.3	4.7	6.9	9.9	14.4	18.7	23.0	6.3	13.5	17.3	19.9	23.4
Peru	0.7	1.1	1.3	2.6	3.4	4.4	5.0	1.9	3.5	4.3	5.1	5.8
Venezuela	0.5	0.2	-4.5	-7.1	-5.1	-3.3	0.9	-2.9	-3.3	-0.2	1.3	5.6

CHANGES IN THE BALANCE OF PAYMENTS

One interpretation of the fourfold increase of the external debt of Latin-American countries is that at the end of 1973 the price of oil went up and the non-oil countries went into debt to pay for their oil imports. That indeed is a significant part of the problem, but far from the entire story. Consider, for example, 1977: in that year the countries of Latin America excluding Venezuela borrowed \$11 billion. But the deficit in their trade account was zero. Of considerably greater importance in explaining the increase in their debt in that year were the net interest and dividend payments which amounted to \$9.2 billion, and the additions to reserves, which amounted to \$5.1 billion. To understand what has happened to external debt one must clearly know more than what has happened to oil prices.

The change in external debts is but one item in the balance of payments: in summary the increase in debt is equal to the current account deficit plus the change in reserves. A more elaborate balance of payments statement is given for all Latin America and the Caribbean with the exclusion of Venezuela.⁵ The trade item covers merchandise imports and exports plus all services payments, except interest and dividends, which are shown separately. Unrequited transfers are usually included in the current account but in this paper are shifted to what are called the financial accounts. The figures in the capital accounts are presented net, that is, outflows have been netted against inflows.⁶ The short-term capital movements are a composite including errors and omissions.

Aggregation over countries is somewhat misleading in the case of balance of payments analysis; space, however, does not permit an analysis of each country's experience. However, it is useful to note a few common traits for the countries of the area, again excluding Venezuela, whose external balances have moved so strongly against the trend (Table 5). 1973 saw an improvement in the trade accounts for most Latin-American countries, particularly because of a favorable movement in the terms of trade. In 1974 both imports and exports exploded; in dollar terms exports rose 45 percent, imports 60 percent, but price increases were responsible for almost all of the growth. Because aggregate prices indexes are unreliable, I have made no formal attempt to separate price movements from real changes but the overall effect is clear from the country accounts. Because of the more rapid rise in import prices and the deterioration in the terms of trade, the trade deficit increased by \$8 billion. In 1975 the trade deficit increased another \$1 billion, raising the aggregate deficit for Latin America excluding Venezuela to \$10 billion. To meet the huge deficits the countries borrowed heavily and drew down their reserves.

1976 and 1977 were years of substantial improvement. Aggregate trade, in deficit by \$10 billion in 1975, was in balance by 1977 due to sharply higher export prices. In 1978 there was a deterioration in the overall trade balance; price

Table 5

BALANCE OF PAYMENTS FOR THE NON-OIL LATIN-AMERICAN COUNTRIES (billions US \$)

	1972	1973	1974	1975	1976	1977	1978
Goods and services	-4.5	-5.0	-14.0	-16.3	-12.4	-9.1	-12.8
Trade	-1.6	-1.1	-9.1	-10.5	-4.8	0.1	-1.7
Exports	20.6	29.1	43.1	40.4	49.2	59.8	65.4
Imports	-22.2	-30.2	-52.1	-50.9	-54.1	-59.7	-67.2
Interest and dividends	-2.9	-3.9	-4.9	-5.8	-7.6	-9.2	-11.1
Net dividends	-1.4	-1.9	-2.2	-2.0	-2.4	-3.3	-3.7
Interest receipts	0.5	0.8	1.7	1.3	1.3	1.7	2.6
Interest expenditures	-1.9	-2.8	-4.4	-5.1	-6.4	-7.6	-10.0
Financial accounts	7.3	9.0	13.9	14.3	16.8	14.2	22.2
Unrequited transfers	0.4	0.5	0.5	0.7	0.8	0.7	1.0
Capital accounts	7.0	8.5	13.4	13.6	16.0	13.5	21.2
Direct plus portfolio	1.6	2.4	2.1	2.9	2.8	4.6	4.5
Other long-term	4.8	5.8	10.5	9.7	12.1	11.0	14.3
Short-term plus E and O	0.6	0.3	0.8	1.0	1.1	-2.1	2.5
Reserves	-2.8	-4.0	0.1	1.9	-4.4	-5.1	9.4

Source: IMF *Balance of Payments Yearbook*, Supplement to Volume 30, December 1979.

and quantity indexes are not yet available, so one cannot determine the factors responsible for the change. Borrowing continued to be heavy throughout the three years, as the countries moved to rebuild reserves, particularly in 1978. Preliminary trade figures for the first half of 1979 appear strong; however, toward the end of 1979 oil prices again increased substantially and, though some export prices were also up, the trade deficit probably grew in the last half of 1979 and the beginning of 1980.

The current account as traditionally measured has remained in deficit throughout the period. Over the years 1972-78, the total deficit amounted to \$74 billion. But there is a considerable difference between the trade and current account deficits. For the non-oil countries the combined trade deficit in the years 1972-78 amounted to only \$29 billion; the other \$45 billion was for net payments of interest and dividends, which grew from \$2.8 billion in 1972 to \$11.1 billion in 1978. Thus interest and dividends contributed much more to the deficit than did trading factors, particularly in the years 1977 and 1978. It is questionable, however, whether interest payments should be included in the current account deficit.

In spite of their large nominal volume, net interest payments in real terms have been effectively zero. Again one must realize the issue of the appropriate price measure to use in analyzing real as distinct from nominal interest payments. In the prior section it was suggested that there are advantages in using a price index which reflects inflation in the developed countries; it shows less inflation over this period than the prices of the imported or exported goods of the LDCs. Since 1972 the average annual increase in the index of developed

countries' consumer goods prices has been 8.7 percent; over that period the average interest paid by Latin-American countries on their external debt has been 5.9 percent, implying a negative real rate of interest of almost 3 percent on average.

A zero real rate of interest would mean that the real value of the debt was depreciating by an amount equivalent in value to the payment of interest. A negative real rate indicates an even greater depreciation. How then should we conceive of the billions actually being paid in interest? Consider how the balance of payments accounts would look in a price-stable world with a zero interest rate. There would be no net interest paid and the current account deficit would equal the trade deficit. That would also be the case in an inflationary world with a zero real interest rate in which the balance of payments had been adjusted for inflation. An amount equivalent to the depreciation in the value of the debt would be added to the current account or subtracted from interest payments. In either case the effect would be the same; the current account deficit would be reduced by an equivalent amount. With a zero real rate of interest, interest payments should be treated not as a current account but as a capital account item, that is, as part of amortization. Interest payments in an inflationary world are primarily a repayment of principal in the form of a payment to the lender of an amount needed to compensate him for the loss in principal value due to inflation. This suggests that if the real rate of interest is approximately zero, the trade deficit as defined measures the deficit "better" than the more traditional current account deficit.

It may be useful to add an additional thought on what will probably be a controversial point and that is to consider these interest payments from a welfare standpoint. At a high nominal, but zero real interest rate, a debtor who borrowed in order to purchase and store the items in the price index would find that he could sell in the future the items he held for the amount needed to pay both principal and interest on his debt. But what of the borrower who used the funds to finance consumption at higher prices? To repay his debt he would have to reduce his future consumption. At a zero real interest rate, the reduction would be equivalent to the amount consumed, at a negative interest rate, less than the amount consumed. Still, future consumption would be less because of the borrowing and in a welfare sense is not cost-free.

The decade of the 1970s has been one of extraordinary turbulence in the balance of payments of less developed countries in general, and Latin-American nations in particular. In the six years between 1972 and 1978 the value of imports and exports of Latin-American countries almost tripled, but most of the growth was due to price movements. While the decade has in general been inflationary, prices of traded goods rose particularly rapidly. But the price movements have been anything but constant. Consider, for example, Brazil: between 1970 and 1977 export prices rose 221 percent; import prices 172 percent; the terms of trade improved 18 percent. But comparisons over the entire period

are misleading; a different impression emerges from a year-to-year comparison. In 1971 terms of trade worsened 13 percent; in 1972 improved by 6 percent; in 1973 improved by 5 percent; in 1974 worsened by 11 percent; in 1975 worsened another 9 percent; in 1976 improved by 5 percent; and in 1977 improved a staggering 31 percent. In 1974, for example, the change in the terms of trade of Brazil led to a \$2.6 billion increase in the trade deficit equivalent to 2 percent of GNP.

In addition to the price swings, the years since 1974 have been ones of much slower real growth in the world economy. This has meant slow growth in real exports. Of the countries under study only Argentina and Chile show any substantial growth in real exports, though in the case of Colombia there may be some hidden, unrecorded growth. As regards real imports the picture is mixed. Argentina, Chile, and Colombia have experienced little growth in real imports during the period. Brazil's real imports rose very rapidly in 1974, fell somewhat in 1975, and then remained at that level. By 1977 real imports to real GNP was roughly the same as in 1970, but there had been quite a bulge in the intervening years. Peru allowed real imports to rise very rapidly between 1972 and 1975 and then took measures which caused them to fall to their 1972 level. Venezuela experienced an 18 percent per annum growth in real imports over the period. Even with the extraordinary rise in oil prices, this led to substantial deficits in 1977 and 1978.

The countries of Latin America have been able to cope with the shocks due to price increases and slow export growth only to a degree through reserve adjustments. Most of the non-oil countries allowed reserves to fall in 1974 and 1975. But reserves serve as transactions and precautionary balances, and by the end of 1975, most countries apparently judged their reserves in relation to imports to be too low, especially given the rapid rise in import prices. From 1975 onward most countries have been rebuilding their reserve position. In addition, the private sectors in most countries were adding to their holdings of foreign financial assets. This seems to have been most marked in Argentina, Mexico, and Venezuela.

The other form of adjustment was external borrowing. The deficits in the non-oil countries were matched by surpluses in certain oil countries, who channeled their surplus funds to commercial banks who then re-lent the funds to the deficit countries. As mentioned earlier, the huge expansion in bank lending to less developed countries, after netting out deposits, reduces to the effects of a few Middle Eastern oil companies lending to a few Latin-American countries. Brazil and Mexico were clearly the most important recipients of such flows but the other major countries of Latin America were also substantial net borrowers.

The increase in debt has resulted in substantial growth in interest payments. By the end of the decade net interest and dividends payments were close to double the trade deficit. Countries had to borrow to finance their interest payments. But as long as these payments were close to zero in real terms, borrow-

ing to finance them did not add to a country's debt burden. The next section examines the debt measurement question, and the future for external debt.

THE FUTURE FOR EXTERNAL DEBT

What are "safe" levels and rates of change for borrowing by LDCs? This is no longer an academic question, if indeed it ever was; rather it represents an issue of considerable concern to the world's major commercial banks and international lending institutions, to the agencies responsible for commercial bank regulation, and to the developing countries themselves. This problem has received substantial attention over several decades: J. Avramovic wrote his book on growth and debt [2] in 1964 but the issue of the safe limits of debt and country credit risk evaluation have become a matter of much more immediate concern since the debt explosion following the oil price increases in the 1974-75 period.

The Burden of Existing Debt

The attempt to analyze a country's debt position can be broken down into assessments of the near term and the longer term. The near-term issue is usually one of liquidity: whether a country will have the cash flow to pay both what is due on interest and principal and to finance imports. The longer-run problem focuses upon what can be called country "solvency." Here, usage of the term "solvency" is not equivalent to the corporate concept of solvency, for unlike a firm, a country's external liabilities will never exceed its assets. The analogue to corporate insolvency is the point at which the lenders might be forced to write down, not simply reschedule a country's debt. Liquidity problems occur when a country does not have enough foreign exchange to meet its bills, which could presumably occur at any level of debt. Solvency becomes a concern when a country has a "high" level of debt and the conditions are such that debt is growing more rapidly than GNP.

A complete analysis of these issues, which is beyond the scope of this paper, would consist of three parts: an appraisal of the burden of existing debt, an analysis of the rate at which debt would accumulate under alternative conditions, and an appraisal of the point at which external debt would exceed a country's ability to repay. This paper has little to say about the last point, though there have been suggestions that developing countries should repudiate their debt when the net flow becomes negative, that is, when what they had to pay exceeded what they were receiving. Clearly that analysis is too simple, as it ignores the question of risk. A good name is a necessary condition to have access to credit. The standby capacity to borrow in the future, if it proves necessary, is worth some present sacrifice.

Let us consider the other two questions — the measurement of the burden of existing debt and the speed at which debt might accumulate. Various analysts favor different measures, but most utilize a ratio, the numerator being

a measure of debt or debt servicing and the denominator a measure of exports or GNP. Given these concepts, there are a variety of ways to measure both numerator and denominator; for example, debt may be treated gross, or gross but adjusted for the fact that loan terms differ. Alternatively, a country's holdings of foreign financial assets may be netted out of debt. When debt servicing is used as the numerator, it may include only interest, or interest plus amortization payments, or interest plus dividend payments, and all units may be measured by gross or net of receipts. As regards the denominator, exports may be measured gross or net of the import content of exports or net of "incompressible" imports. Furthermore, each of the ratios may be measured in absolute terms or first differences. Thus, though there are only a few concepts, there are many potential measures and at the present time, too little experience to judge which are the better indicators.

To date the choice of measures has been ad hoc.⁸ The ratio of debt servicing to exports seems most useful as a short-run liquidity measure; the ratio of debt to GNP appears more appropriate as a longer-run solvency measure. Table 5 gives one possible measure of each concept for the various countries. The measure of debt servicing reported in Table 5 is net payments of interest and dividends. Countries have generally little trouble rolling over maturing debt. Amortization payments have been excluded from the measures of debt servicing. To measure the burden of debt servicings, the import content of exports and perhaps all of incompressible imports should be netted out of the denominator. For the present study, this proved too complicated, and thus the figures in Table 3 underestimate the "burden." On the other hand, the estimates are biased upward by the underreporting of interest receipts which are not repatriated. It is not clear how better measures would affect the countries' comparative rankings.

In spite of the substantial growth in total debt there has been surprisingly little change in the burden of servicing the debt for Latin America for the years under study. This is because export prices almost tripled during the period. Over the six years the burden of servicing the debt of Argentina, Colombia, and Venezuela has, in fact, declined substantially while Chile's is changed little. For Brazil, Mexico, and Peru, the burden of servicing debt has grown substantially. In terms of levels, debt servicing is equally heavy for these three countries, much lighter for the others.

The ratio of debt to GNP is a longer-run measure of debt burden. It is more useful than the debt-to-export ratio if over the longer run a country can change the fraction of output that it exports. Also this measure is less influenced than the former by the change in the prices of exports relative to other goods, which has been so marked in recent years. But this debt-to-GNP ratio is more stable than the debt-to-export ratio. Ideally, such a ratio would be preferable to measure debt in terms of present rather than face values to take into account that some loans contain a substantial element of subsidy. This also proved too time-

consuming for this paper. To assess burden it makes sense to measure debt net of holdings of foreign financial assets. In the measure reported in Table 5 only official reserves have been netted out.

Furthermore there is a problem of measuring GNP in dollar terms, because of under- and overvaluation of exchange rates. In view of this problem, GNP figures reported by the World Bank in which exchange rate changes have been smoothed have been used. By this measure Brazil, Mexico, Peru, and Venezuela show a rapid increase in their debt burden from 1974 to 1978, Argentina a small increase. Chile shows a small decline while Colombia halved its debt burden over the four years. Using this measure Peru's debt was much the heaviest of the seven countries at the end of 1978; Mexico and Chile followed. Though huge in absolute size, Brazil's debt relative to income and foreign exchange reserves appears modest. Some slight modification of the relative rankings would be necessary if gross debt or debt net of BIS holdings were used as the numerator.

The two rankings provide different perspectives about what has happened to the debt burden over the last half of the 1970s and of the relative rankings of different countries. They are most different in the case of Argentina and Venezuela. Both countries show increasing debt-to-GNP ratios, but falling debt-servicing ratios. The difference apparently lies in the large private holdings of financial assets. The large accumulation of privately held foreign assets is not captured by netting out only official reserves.

In terms of relative positions, Brazil, Chile, and Peru are most interesting. Inclusion of dividends in debt servicing but exclusion of investments from debt changes Brazil's ranking. Were direct investments added to debt, Brazil's ratio of external obligations to GNP would increase substantially more than that of other countries. Chile and Peru, on the other hand, have a higher component of loans from official lenders at lower interest rates than the other countries; in the case of Chile 35 percent of total loans came from official sources; in the case of Peru, the figure is 38 percent. For comparison, for Brazil and Mexico, the figures are 12 percent and 13 percent respectively.

Potential Future Problems

The second issue concerns the conditions under which debt is likely to become troublesome. Here it is useful to distinguish between "internal" factors and "external" disturbances to the balance of payments. In a recent paper, Robert Aliber [1] argued that most of the debt crises in recent years were "monetary in origin, best viewed as a consequence of an appreciation of the real exchange rate." Due to overvalued exchange rates, he argues, deficits in the current accounts widened. Fears of devaluation led to overflows in the capital account rather than additional borrowing to finance the deficits. In three-fourths of the cases, debt crises were coupled with devaluations and in the others, Ali-

ber argues, it should have been. Thus, Aliber's position is that debt crises are the result of internal policy errors, namely excess domestic money creation leading to inflation, which with a fixed exchange rate can cause overvaluation of the currency, current account deficits, capital outflows, and debt crises. Floating exchange rates, Aliber feels, will go far to prevent this kind of crisis. Aliber's focus appears to be short-run liquidity problems, rather than long-run solvency problems, for he appears to argue that the crisis is independent of the level of debt. He may well be correct that many — though not all — of the past debt repayments crises were produced by internal policy mistakes.

Aliber's analysis gives a partial explanation of the recent buildup in external debt by the Latin-American countries. Overly expansionary domestic policies led to overvalued exchange rates in Chile in the early 1970s, in Mexico and Peru in the mid 1970s, and in Venezuela in the late 1970s. But the increase in debt in most countries was not caused by excessive imports, as one would expect if domestic policies were overly expansionary. Rather, it was caused by slow export growth and, more important, by deteriorating terms of trade and increasing interest payments. Perhaps one can say that the countries did not match the deteriorating external conditions with a sufficiently contractionary domestic policy. However, a significant portion of the debt buildup, particularly in Argentina, Mexico, and Venezuela was used to finance the acquisition of foreign financial assets by the private sector. Whether one calls this portfolio diversification or capital flight, there were conditions in domestic capital markets which led private citizens to feel that it would be wise to invest part of their capital abroad, though the reasons for this were probably different in Venezuela than in the other countries.

Though overvaluation of the exchange rate may cause balance of payments difficulties, external factors are clearly another potential source of trouble. What are the most likely types of external shocks? Two have already been mentioned; adverse movements in the terms of trade, and world recession leading to slow export growth. Shocks emanating from the financial markets, such as higher real interest rates and credit rationing, could also be of importance.

Credit rationing is more a liquidity issue than a solvency problem, capable of producing short-term embarrassment but not likely to lead to long-term problems. But the Federal Reserve has directed US banks that loans to any one LDC should not exceed 10–15 percent of bank capital. For the larger countries (Brazil and Mexico) existing loans already are above that level for many of the major US banks. Other industrial country central banks have approached the problem somewhat differently, but the net effect has been to discourage lending to countries with large absolute debts already outstanding to commercial banks. For countries without excessive debt burdens, credit rationing by commercial banks is only likely to delay the flow of funds, but in the short run that delay could prove troublesome.

This paper stressed the low or even negative interest rates that have prevailed over much of the period under study. But in the last half of 1979 and in early 1980, interest rates have moved up sharply. My argument for not including net interest payments in the current account balance was only that the payments in recent years have been at a zero real rate. Real interest payments should certainly be included in the current account. As noted, it is difficult to measure precisely the real interest rate on international debt; but by whatever measure chosen, the real rate would appear to be higher in 1980 than in earlier years. For a country like Peru with a debt equal to 50 percent of GNP, a rise of 2 percent in the real interest rate is equivalent to an annual tax of one percent of GNP; for Brazil with its lower debt, the tax would be half that. What would cause the real interest rate to rise differs among countries. For Brazil's external debt the real rate depends upon what happens to LIBOR. Other countries have more fixed interest rate debt; while also affected by changes in real LIBOR, the average real interest rate which they pay on their external debt is more influenced by the rate of inflation.

Growth in External Debt

I now attempt to employ a simple model to demonstrate how the factors mentioned might lead to a buildup of debt over much of the decade of the 1980s. The model used was developed for a more general analysis of the external debt of the non-oil less developed countries [3]. It is a simple model and no claim is made for its elegance or ability to forecast. It allows exploration of what might happen to debt under various scenarios. As the measure of debt's burden to a country, I have chosen the debt-to-GNP ratio. All changes in the model are expressed in real terms.

The first equation is a definition of the increase in external liabilities (D) which is the difference between imports (M) and exports (X), plus interest payments on the outstanding debt (iD); plus the amount added to foreign financial assets (a) less what is received in unrequited transfers (T).

$$(1) \quad D_{t+1} - D_t = M_{t+1} - X_{t+1} + iD_t(A_{t+1} - A_t) - T_{t+1}.$$

In order to express the change in debt as a function of the change in income, the stock of debt and the real interest rate, I shall make a number of assumptions, the justification of which is that they reduce the number of variables and appear to be reasonable long-run approximations.

Let us assume that the trade gap ($M - X$) less what is received in unrequited transfers is proportional to output (Y).

$$(2) \quad M_t - X_t - T_t = aY_t.$$

Further assume that the change in a country's holdings of financial assets is proportional to the change in imports:

$$(3) \quad A_{t+1} - A_t = b(M_{t+1} - M_t).$$

Lastly assume that imports are a fixed proportion of output.

$$(4) \quad M_t = cY_t.$$

Substituting Equation (4) into Equation (3) and Equations (2) and (3) into (1) we get the change in debt expressed as a function of income, the change in income, the stock of debt, and the interest rate.

$$(5) \quad D_{t+1} - D_t = aY_{t+1} + iD_t + bc(Y_{t+1} - Y_t).$$

Equation (5) can be solved for the debt to GNP ratio:

$$(6) \quad D_{t+1}/Y_{t+1} = a + (1+i)/(1+r)(D_t/Y_t) + bc[r/(1+r)],$$

where r is the growth rate of output. Let $G_t = D_t/Y_t$, then Equation (6) can be rewritten as

$$(7) \quad G_{t+1} = (1+i)/(1+r)G_t + (a + ar + bcr)/(1+r).$$

Let $k = (1+i)/(1+r)$ and $j = (a + ar + bcr)/(1+r)$.

We can then rewrite Equation (7) as

$$(8) \quad G_{t+1} - kG_t = j.$$

This first-order difference equation has the following solutions:

$$(9) \quad G_t = (G_0 - j)/(1 - k)k^t + j/(1 - K),$$

when $k \neq 1$ and $G_t = G_0 + jt$, when $k = 1$.

Using Equation (9), we can calculate both the number of years it will take for the debt to GNP ratio to increase to any specified value, and the limit to which debt will grow, for given values of the parameters, a , b , c , i , and r . If k is between zero and one (that is, both the interest rate and growth rate are positive and the growth rate greater than the real interest rate on external debt), G_t , the debt-to-GNP ratio, will converge in the limit to $j/(1 - k)$, the approach path being nonoscillatory.

This is not a fully interactive model; the rate of growth of GNP is not independent of the growth of imports and exports or the size of the trade gap. Rather than be specific about the relationship, I shall allow both the trade gap and the growth rate to vary; that is, the projections will be conditional. I shall follow the same approach with the real rate of interest.

Once feasible parameter values have been determined the model can be used to make conditional debt projections of various kinds. I shall use the model to determine the rate at which debt would increase, measured as the number of years required for the ratio of debt to GNP to increase by 10 percentage points from its present level. The key parameter values in the model are the deficit in the current account, the level of initial debt D_t/Y_t , the real interest rate (i) and the rate of growth of GNP (r). Of lesser importance are the parameters which give the ratio of foreign-held assets to imports (b) and the ratio of imports to GNP (c). In the model borrowing to finance the acquisition of assets

has little impact on the debt/GNP ratio, eliminating the need for considering whether we are interested in gross or net debt. The reason for the apparent difference between the model and recent experience in this regard is inflation. The model is constructed in real terms; countries have been borrowing to add to reserves, not because real imports were growing but because rising prices have inflated trade values.

Consider the case of Brazil: the present debt is 25 percent of GNP; the deficit in the trade account 2 percent of GNP; GNP growth has been 8 percent per year; the real interest rate on debt is effectively zero; imports have been 10 percent of GNP; and foreign asset holdings are about 40 percent of imports. Let us consider how rapidly debt might accumulate relative to GNP for various adverse changes in economic conditions. Real interest rates might rise and real growth rates might fall. A number of factors, such as adverse movements in the terms of trade, an overvalued exchange rate, a world recession coupled with export decline, might lead to an increase in the current account deficit. Holding constant the accumulation of foreign assets, we can calculate how each of these changes, or a combination of them, would affect debt accumulation.

Changes in the size of the current account deficit most affects debt accumulation. If the deficit is only one percent of GNP, the debt ratio will decline at real rates of interest below two percent. But with a deficit of 5 percent debts will grow rapidly even if the real rate of interest is zero; in fact, with a 5 percent deficit and zero real interest rate the debt would grow from .25 to .35 of GNP in less than three years. A slowdown in growth, other things the same, will also lead to a more rapid buildup in debt. At a 2 percent real interest rate and a deficit of 3 percent of GNP, it would take 6.3 years for the debt to grow from .25 to .35 of GNP, only 4.3 years if the growth rate is only 5 percent. An increase in the real interest rate from 0 to 2 percent would shorten the period for debt to accumulate by 10 percentage points from 9.5 to 6.3 years, if the deficit is 3 percent of GNP and the growth rate 8 percent.

I have worked out comparable figures for the other countries, given the conditions prevailing in each. Rather than present the entire set, let us consider how various scenarios might affect the debt ratio in various countries. I shall consider the following examples: an adverse movement in the terms of trade for Chile; higher real interest rates for Peru; capital flight in the case of Mexico; world recession and an export decline in the case of Peru; disaster — namely a decline in growth, rise in interest, and a rise in the deficit — in the case of Brazil. The results are summarized in Table 6.

All countries are to a degree exposed to each of the problems considered. My estimate of the countries most exposed to the problems, given in the second column, is impressionistic. The third column indicates the parameter in the model which has been changed to reflect a particular adverse development and the numerical change in the parameter is shown in the fifth column. The fourth column gives the country chosen to illustrate the problem and the applicable

Table 6

SPEED OF EXTERNAL DEBT GROWTH - ALTERNATIVE SCENARIOS

Problem	Countries most exposed	Impact in model	Example ¹ country	Impact assumed	Years debt increase ²
Adverse terms of trade	Brazil, Chile, Peru	Increase in trade deficit (a)	Chile $r = .03$ $i = .01$	$a = .01$	25.0
				$a = .05$	2.3
Higher real interest rates	Brazil, Mexico, Peru	Higher interest rate (i)	Peru $r = .05$ $a = .03$	$i = 0$	13.3
				$i = .02$	6.1
Capital flight	Mexico, Venezuela	Higher financial holdings (b)	Mexico $i = .02$ $r = .06$ $a = .02$	$b = .3$	12.5
				$b = .4$	4.3
Export decline	Argentina, Colombia, Peru	Increased trade deficit (a)	Peru $r = .05$ $i = .01$	$a = .03$	7.7
				$a = .05$	3.0
Disaster		Decline in growth (r); rise in interest (i); rise in deficit (a)	Brazil	$r = .08$	Neg ³
				$a = .01$	
				$i = 0$	
				$r = .05$	
				$a = .05$	
				$i = .02$	1.9

¹Under each country are listed the other parameter values assumed constant for each example. In the model a is the size of the trade deficit expressed as a percentage of GNP, t is the fraction of imports held as reserves; i is the real interest rate on external debt, and r is the rate of growth of GNP.

²The number of years for debt ratio to rise by 10 percentage points under conditions holding in that country.

³The debt ratio would decline.

country parameters. The sixth column gives the impact that that particular problem would have on the speed of debt accumulation. For each case two figures are given; the first is the number of years it would take debt to accumulate by 10 percentage points with the base value for the parameter, the second the number of years assuming the more adverse conditions. The impact of other scenarios could be tested in a similar fashion.

CONCLUSIONS

The facts about debt and trade presented in this paper are too numerous to summarize. Therefore, I shall confine concluding remarks to methodological issues. In the first section of the paper, two methodological points were raised, the first dealing with the "correct" deflator for translating nominal into "real" debt. It was argued that the "real" value of financial assets is a questionable concept. But if one wants to estimate the growth in "real" debt over time, one should deflate the nominal figures by an index that measures underlying "inflation" and is as free as possible of short-run changes in relative prices. The second issue concerns the concept of "net" external debt. Not all borrowings are used to finance a current account deficit; a part is used to finance the

acquisition of foreign assets by both the public and private sector. It is not clear how one should deal with this problem in appraising the growth in external debt.

In the second section of the paper an attempt was made to analyze why the external debt of particular countries had risen so rapidly in the years 1972-78. One factor was the large sums borrowed to finance the payment of interest. But it has been argued that the inflationary component of interest payments should not be included in the current account of the balance of payments; rather this should be treated as debt amortization in the capital accounts. During the period under study that would eliminate from the current account essentially all of the interest payments. Funds borrowed to finance such payments are essentially an inflationary adjustment, and do not add to a country's real debt burden. A substantial sum, though less than the amount borrowed to pay interest, was obtained by both the public and private sector to finance the acquisition of foreign financial assets. That we do not know how to treat private sector holdings of financial assets has already been mentioned. But financial assets earn roughly what is paid on external debt. Debts contracted to finance official asset purchases and, depending upon the repatriation of interest, debts contracted to finance the private holdings of foreign exchange add little to the debt burden.

The third section sorted out some issues involved in country credit risk analysis and debt projections. An attempt was made to separate liquidity from solvency issues, internal from external disturbances, and present debt and debt servicing levels from possible future developments. Liquidity has to do with cash flow; solvency with the accumulation of debt relative to the ability to service debt. Various measures of each are possible. Both better principles for formulating measures of debt burden, and better empirical studies for assessing the predictive value of alternative measures are needed.

A model was developed to assess the rapidity with which debt might accumulate under alternative conditions. Argentina, Colombia, Mexico, and Venezuela would appear to be in relatively strong positions vis-à-vis their external debts. The positions of Brazil, Chile, and Peru are more problematic. Expansionary domestic policy, adverse movements in the terms of trade, higher real rates of interest, or a slowdown in the growth of GNP or exports could all lead to a rapid accumulation of debt relative to income. Difficulties in either Chile or Peru would cause domestic complications, but problems in Brazil would have more widespread repercussions, for this country is the keystone on which the edifice of commercial bank lending to less developed countries is built. The slightest tremor in that key relationship would certainly cause a reappraisal of the present mechanisms for recycling the surpluses of the oil-exporting nations to meet the deficits of the others.

The economist's tools have lagged behind developments in the real world. This paper represents an attempt to contribute to the techniques for debt analysis. The analysis of external debt and country risk is in its infancy. Problems abound. We do not know how to construct or interpret debt measures, let alone analyze country risk. Economists are accustomed to thinking about external borrowing in a growth context, not in a stabilization context. The monetary approach to the balance of payments ignores both the increase and the level of external debt; countries who follow this approach do so only at considerable peril.

NOTES

* My thanks are due to Francisco Padilla who produced the many tables in this paper quickly and accurately.

1. Excluded are the Bahamas, Bermuda, the Cayman Islands, and Panama which are offshore banking centers.

2. The BIS data for 1974 is less complete than for later years; debt growth figures calculated using the 1974 figures as the base are likely to be somewhat exaggerated.

3. In the case of Brazil, the government reports their own estimates of the outstanding debt. The reported figures are \$17.1 billion for 1974; \$21.1 billion for 1975; \$26.0 billion for 1976; \$32.0 billion for 1977; and \$43.5 billion for 1978. These figures are in reasonable agreement with those calculated using the procedure already described.

4. There are various ways to translate GNP figures in domestic currency into dollar terms. I have taken figures from the World Bank atlas which attempts to compensate for exchange rate movements.

5. In the draft of the paper presented at the conference, the balance of payments of each of the countries was examined separately. In order to reduce the paper to a publishing length, the country analysis has been eliminated.

6. As mentioned in the prior section, acquisition of financial assets abroad by the private sector is not insignificant and should be included in a more thorough analysis.

7. Attempts have been made to apply more sophisticated statistical tools to the issue of country risk analysis. The results to date are mixed. For a critical review, see [5].

REFERENCES

1. Robert Aliber, "A Conceptual Approach to the Analysis of External Debt of the Developing Countries," mimeo.
2. J. Avramovic and others, "Economic Growth and External Debt" (Baltimore: Johns Hopkins Press, 1964).
3. Millard Long, "Balance of Payments Disturbances and the Debt of the Non-Oil Less Developed Countries: Retrospect and Prospect," *Kyklos*, Vol. 33 (Fall 1980), pp. 475-98.
4. ——— and F. Veneroso, "A Note on the Real Value of International Financial Assets," *Review of Income and Wealth* (forthcoming).
5. Kriskan Saini and Philip Bates, "Statistical Techniques for Determining Debt-Servicing Capacity for Developing Countries," Research Paper #7818 (New York: Federal Reserve Bank of New York, September 1978).

