

A NOTE ON THE REAL VALUE OF
INTERNATIONAL FINANCIAL ASSETS:
AN APPLICATION TO NON-OIL DEBT

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I. INTRODUCTION

In nominal terms, the international debt of the non-oil less developed countries (NOLDCs) has expanded rapidly during the last five years—from \$63 billion at the end of 1972 to \$187 billion at the end of 1977—the last year for which it is possible to make a comprehensive estimate.¹ However, it is not at all clear what has happened to the value of external debt in real or constant-purchasing-power terms. Most analysts have argued that the value of the debt of these countries has not grown significantly in real terms because of the moderating effects of inflation. Stephen Goodman in a collection of Export-Import Bank conference papers on NOLDC external debt states:

The prices of developing country exports have more than doubled since 1971; indeed, in a single year—1974—export prices rose a startling 44 percent. Because of this rapid rise in prices, there has been a substantial reduction in the real value of the developing countries' debt-service burden from what would otherwise have been the case. In the 1971 to 1976 period, the debt relief provided through inflation averaged \$13 billion annually—more than twice the average annual flow of grants during the period. . . . In real terms, the disbursed debt outstanding of the developing countries is only about 15 percent greater today than it was in 1971 compared with about a 150 percent increase in the nominal value of the developing countries' debt during the period.²

Other writers have reiterated this basic position. Gordon Smith, in a recent paper on the external debt prospects of the NOLDCs, argued:

The real value of outstanding LDC debt has been declining at a remarkable rate due to inflation. For example, total present value of debt service payments due over the period 1973–82 on the public debt outstanding at the end of 1972 was reduced nearly 40% by inflation during 1973–76 alone. . . . In all, some \$42 billion at 1972 export prices (\$72.5 billion at 1976

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¹The basis for these estimates can be found in Long and Veneroso, "The Debt Related Problems of the Non-Oil Less Developed Countries", to be published in *Economic Development and Cultural Change*, 1980.

²Stephen Goodman, "Introduction" in Stephen Goodman, ed. *Financing and Risk in Developing Countries*. Praeger, 1978.

prices) had been transferred to NOLDCs in a reduced burden on the debt by the end of 1976 . . . the size of the implied relief was so large that there is reason to believe that LDC indebtedness would have ceased, at least for a while, to be such a pressing issue had not recession and the oil price increase also intervened.³

In a similar vein, after deflating NOLDC debt with the export price index, Helen Hughes of the World Bank states: "Despite the rise in nominal terms, the increase in the developing countries' external debt was not as great in real terms as it has been in the 1960s."⁴

In this paper we shall argue that the above positions are incorrect and that debt of the NOLDCs has risen substantially in this period, though it is not possible to say by exactly how much. Those concerned with the ability of the NOLDCs to service their debt must take this into account. Any assessment of the real value of the debt is only one indicator of the "burden of the debt" and is no substitute for a more complete analysis of the growth in debt and its servicing costs relative to the growth in income and export earnings.

Appraising the real value of the debt involves an index number problem, but not one of the usual sort. It revolves around the choice of deflator. The income from international debts represents generalized purchasing power and can be used to purchase a variety of market baskets. Therefore, there is no unique basket of commodities whose prices can serve as deflator. There is in fact no "real value" of the debt, only stories to be told about the real value, some of which are more meaningful than others. The story that is told by deflating the debt by the export price index we consider to be misleading. If our position is accepted—that there are only stories to be told—then one might wish to tell different stories about the real value of the debt from the standpoint of different actors, that is, creditors and debtors. However, we shall take a strong position, namely, that the most relevant story is told when deflating the nominal debt by some measure of world inflation for which the best available proxy measure is probably the implicit price deflator of the GNP's of the industrial countries. The choice of deflator would not be a serious issue in a period in which prices moved roughly together, but in the last five years there have been substantial changes in relative prices. For example, export prices of the NOLDCs,⁵ as measured by the IMF's index, have risen 126% while the implicit deflator of the U.S. GNP has risen only 42%.

II. DEFLATING DEBT STATISTICS

Deflating an historical series of values to obtain a new series which measures changes in quantities is straightforward when one is dealing with a basket of goods whose composition does not change over time. In that case, "deflation" eliminates changes in aggregate value due to price changes and provides a measure of

³Gordon W. Smith, *The External Debt Prospects of the Non-Oil Exporting Developing Countries*, Overseas Development Council, Washington, D.C., 1977.

⁴Helen Hughes, "The External Debt of Developing Countries," *Finance and Development*, Vol. 14, December, 1977.

⁵Export and import price indices are published monthly by the IMF in *International Financial Statistics* under "Other (Non-Oil) Less Developed Areas."

changes in the physical quantity of goods—a volume index.⁶ However, a problem arises when deflating the value of financial aggregates. Prices refer to particular goods and in deflating financial aggregates, particularly such aggregates as the external debt of the non-oil LDCs, it is not clear what is the appropriate reference basket of goods and services. Financial assets are monetary claims which can be exchanged for an equivalent value of any basket of real goods. In deflating financial aggregates, we must choose from among all possible baskets of goods that basket which we believe to be most appropriate. What is appropriate may change with the objective of the analysis.

The creditors of the NOLDCs are directly the international agencies and the commercial banks and indirectly the owners of the bonds and deposits used to finance these institutions. Should the creditors decide to exchange their financial contracts for real assets, it is not likely they would purchase a basket of goods similar to the exports of the NOLDCs. Rather they would be more likely to purchase the goods of their country of residence or of the industrial countries in general. Thus creditors would be interested in the purchasing power of their international financial contracts in terms of those goods. As the creditors, themselves, are a diverse group, it is not clear what to take as the appropriate set of reference commodities, but clearly these are better approximated by the output of the industrial countries than the exports of the NOLDCs. Looking at the rates of interest actually charged the NOLDCs on commercial loans reinforces the view that the creditors are concerned about price changes in the developed countries. Nominal interest rates reflect expectations of inflation. The nominal rates on NOLDC loans are comparable to those on developed country loans, and in both cases, the inflation premium in interest rates appears to incorporate expectations of price changes in developed country economies, not NOLDC export prices.

As regards the debtors, one might wish to tell a different story. The analysts quoted above have used the IMF's export price index of the NOLDCs as deflator, presumably because they wished to measure the change in the physical quantity of exports that would be needed to repay the debt. If that is the story they wished to tell, they have from their own viewpoint chosen the wrong index. All of gross earnings are not available to service debt. It is only the domestic value added to imported factors that is available for debt service. For example, for an export industry engaged in the assembly of imported goods using cheap domestic labor, it is only the value added from domestic labor, land, and capital that generates foreign exchange which can be used to service debt. This value added will not necessarily move with export prices, for changes in export prices may well be caused by changes in the prices of imported inputs.

III. THE INTERNATIONAL PRICE OF DOMESTIC VALUE ADDED IN EXPORTS

Any attempt at constructing an index in international prices of the domestic value added in exports of the NOLDCs is challenging both conceptually and practically. First, what commodities should be included and excluded in export

⁶Of course, for most magnitudes in economics which we are interested in deflating, the composition of the basket does change over time. This is the familiar index number problem.

value added? Should only *de facto* exports or all exportables be included; and should only imports used directly as inputs be excluded or should the indirect inputs, such as imported food and fuel used by workers in export industries, also be subtracted to obtain an estimate of domestic value added? Second, what exchange rate should be used to translate domestic prices of value added into international prices? The *de facto* exchange rate can be misleading because of under- or over-valuation at any particular moment, but the alternative—the calculation of a series of shadow prices for foreign exchange—involves numerous problems no matter what estimation procedure is used.

To illustrate, consider the purchasing power parity (PPP) approach to calculating the change in the international price of NOLDC domestic value added. For this calculation, we need to divide the change in the price of the domestic value added price series (ΔP_{DVA}) by the change in the equilibrium exchange rate. According to the PPP theory, the change in the equilibrium exchange rate will be the change in some appropriate domestic price series (ΔP_D) divided by the change in some broadly based international price series (ΔP_F). Therefore the change in the international price of domestic value added would be: $\Delta P_{DVA} \div \Delta P_D / \Delta P_F$. Now in the literature on the PPP theory⁷ there has been a continuing debate about the correct domestic and foreign price indices to be used in constructing equilibrium exchange rates, and a consensus has yet to be reached. But if the domestic price index (ΔP_D) chosen for PPP calculations is the same or even roughly the same as that used to construct the price of domestic value added, the resulting deflator for international debt calculated in this fashion would be simply the foreign price index (ΔP_F). This very different approach leads us back to our contention that it is a broadly based foreign price index, such as would be used in calculating an equilibrium exchange rate, that is the more interesting deflator for calculating the real value of international debt, rather than a narrowly based export price index.

An alternative approach to this problem is to construct an index of domestic value added directly in international prices. Recognizing that the change in export prices is a weighted average of the change in import prices and the change in the international price of domestic value added, one can express the change in the international price of domestic value as:

$$\Delta P_E = Q_M \Delta P_M + (1 - Q_M) \Delta P_{VA} \quad \text{or} \quad \Delta P_{VA} = \frac{\Delta P_E - \Delta P_M Q_M}{1 - Q_M}$$

where P_{VA} is the international price of domestic value added, P_E is the international price of exports, P_M is the international price of imports used in export industries, and the Q_M is the fractional value of imports in exports.

There are unfortunately as many problems associated with this as with the prior approach. Again it is not clear that only *de facto* exports should be included or what imports should be excluded. Furthermore, since we are dealing with the differentials in two price indices which move together, small errors in these indices

⁷For a complete discussion of the PPP approach to exchange rate determination see Lawrence Officer, "Purchasing Power Parity Theory of Exchange Rates: A Review Article," in *IMF Staff Papers*, 23: 1-60, March 1976.

may lead to major errors in the calculated index. Unfortunately, the NOLDC export and import price indices available from the IMF are not very accurate.⁸

In spite of these reservations, using *de facto* exports and guesstimates⁹ of the import content of exports, we have calculated a price index for the value added in NOLDC exports. Because the overall movement in import and export prices over the five years is so similar, the end year comparison indicates that the international price of value added measured in this way has increased in line with export prices. Thus, as shown in Table 1, there is little difference during this period in deflating

TABLE 1
ALTERNATIVE ESTIMATES OF THE REAL VALUE OF NOLDC EXTERNAL DEBT
(IN U.S. \$ BILLION IN 1972 PRICES)

	1972	1973	1974	1975	1976	1977
Nominal Debt	62.6	76.9	102.6	130.5	159.0	187.0
Deflated by Price Index:						
U.S. GNP	62.6	72.7	88.5	102.6	118.8	132.1
OECD GNP	62.6	66.9	81.0	91.4	108.1	121.6
World Consumer	62.6	70.1	81.2	90.9	99.4	105.0
NOLDC Imports	62.6	60.8	54.0	65.3	79.5	91.6
NOLDC Exports	62.6	56.1	54.4	71.8	82.7	82.3
NOLDC Export Value Added	62.6	55.4	55.1	74.1	84.1	79.6
Nominal Debt/Nominal GNP	0.26	0.28	0.29	0.33	0.35	0.35

Source: Long and Veneroso "The Debt Related Problems of the Non-Oil Less Developed Countries", *Economic Development and Cultural Change*, op. cit.

by export prices or the value added index. However, for another period in which there might be substantial divergence between import and export prices the value added index so constructed might not parallel the export price index.

IV. DEFLATION AND RELATIVE PRICE MOVEMENTS

This exercise, however, raises a fundamental question of the meaning of deflating external debt by the observed, short run changes in a price index, when what we are really interested in is the "long run" changes in real values. Individual

⁸The export price index covers only a subset of NOLDCs, with some rather important countries missing. For some countries not reporting export prices but heavily dependent on a single export commodity, the IMF creates an export price index based on reported prices for that commodity. Overall the IMF's index appears to be too heavily weighted by a few commodity exports which have risen substantially in relative price during this period.

⁹For the NOLDCs as a whole, imports in dollar terms were 18% of domestic GNP. GNP is composed only of domestic value added while exports are measured gross, including both domestic and imported inputs. Therefore, if exports had the same import component as GNP as a whole, Q_M as expressed in the above equation would not be 18% but 15%. However, because services which tend to use little imports are, in most countries, a higher proportion of GNP than of exports, we suspect the average import figure for the countries as a whole is somewhat below that for the export industry alone. Consequently, we have used a coefficient of 25% as the direct and indirect import component of exports. We also assumed that the prices of the imports used in export industries moved with the general index of NOLDC import prices. Both of these assumptions about Q_M and P_M are crude and could be further refined.

loans are, of course, repaid in the short run, but the total debt of the NOLDCs will continue to grow over time, at least in nominal terms. Even during 1977, a relatively favorable year for the NOLDCs, the debt increased by \$28 billion. The interesting questions about the real value of the external debt are placed in a longer run, historical context, not in the short run. For example, let us assume the price of a country's basic export, coffee, were to rise sharply in the short run. Even if in that year it would require less coffee to repay debt, the country would not be likely to reduce imports to repay its debt simply because the coffee price was high and certainly not if the high price was generated by a short-fall in the quantity available for export.

Conceptually, the price increase indicated by a particular deflator can be decomposed into two parts—the change in price due to inflation, and the change in the prices of the commodities in the index relative to the prices of other goods. Relative price movements can be set off by short run changes, for example, a crop failure, and therefore may prove to be short lived. But even if the price change is permanent, it is likely to set off adjustments in demand or supply which will, over the longer run, tend to push the movement in price of an individual commodity more into line with world prices.

An historical example will illustrate the problem as regards the exports of the NOLDCs. The prices of basic commodities rose in relative price three times in the 20th century—in 1919–21, 1951–53, and in 1972–74. In the first two cases the increase was followed by a gradual decline in the relative prices of commodities compared to the prices of industrial products. From their Korean War highs export prices of the non-oil LDCs declined by more than 20% over the next decade; in absolute terms the export prices of the NOLDCs were no higher in 1971 than they had been 20 years earlier. The relative increase in NOLDC export prices in the period 1951 to 1953 proved transitory. Recent trends suggest that excepting oil, the same story may be told about the 1972–74 episode. In 1972 through 1974, export prices of the NOLDCs rose 87% while U.S. prices rose 16%. But, since 1974, industrial country prices have been rising somewhat more rapidly than the prices of NOLDC exports. The question is whether the remaining difference will be dissipated in the longer run.

Whether the increase in the relative price of exports is relevant from the debtor's viewpoint in assessing the real value of its debts depends in large part on whether the change in relative price is transitory or permanent. If the nominal value of the debt is deflated by price indices containing large, transitory movements in relative prices, the implications about the debt's real value could turn out to be seriously misleading over a longer time horizon in which the relative component in prices would be dissipated. In fact, if we use one of the trade related indices as deflator, the estimated real value of the NOLDC would fall in 1974, in spite of this being the year in which the percentage increase in nominal debt was greatest.

From the debtor's standpoint, a more conservative approach, and judging by past history the more accurate one, is to assume that over the longer run the relative price component will disappear and the NOLDC's export prices will move in line with a broader measure of world prices. Therefore, to judge what has happened to the real value of the debt, even from the perspective of the debtor, it

is better to deflate the debt's nominal value by an index of world prices measuring inflation alone, rather than by an export price index containing a large component of relative price movement.

V. CONCLUSION

Our purpose in this paper has been to show that the story told by deflating the debt of the NOLDC's by the export price index can be misleading and that a more interesting story is told by deflating the debt by an index which better reflects the underlying inflation in world prices. Clearly that is a broadly based index, but which of the several proxies available would be best is open to question. There are objections to each of the three that most quickly come to mind, the IMF's world consumer goods price index, the implicit price deflator of the OECD countries' output, and the implicit price deflator of the United States GNP. But as we are only telling stories about the real value of the debt, and as each of these deflators tells roughly the same story, we need not concern ourselves with refinements.

The results of deflating the external debt of the NOLDC by the various indices are shown in Table 1. Using the export index as deflator, the real value of the debt grew by only 31%. As this is in line with the growth in real output and real exports of the NOLDCs, there would not seem to be a serious debt problem. However, if, as we have argued, deflation by a measure of developed country prices is more relevant, the real value of the NOLDC debt has doubled in this five year period; that is, it has grown much more rapidly than the resources available to service the debt. This result is supported by the observation that in nominal terms the debt has grown from 26% of GNP in 1972 to 35% in 1977. Assessing whether this level of debt will cause problems for the NOLDCs is, however, beyond the scope of this paper.¹⁰

¹⁰For a conditional assessment, see Long: "Balance of Payments Disturbances and the Debt of the Non-Oil Less Developed Countries: Retrospect and Prospect", *Kyklos* 1980.