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DEBT AND CONDITIONALITY UNDER ENDOGENOUS TERMS OF TRADE ADJUSTMENT

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ABSTRACT

The purpose of this study is to identify conditions under which renewed international lending will benefit both the developed and the developing countries. Our analysis will evaluate how the presence of terms of trade adjustment and distorted credit markets affect the conditions for the existence of beneficial lending. We demonstrate that in the presence of endogenous terms of trade adjustment, there are cases in which a competitive international banking system may not revitalize lending for investment purposes, even if such renewed lending is socially desirable. Renewed lending may require the appropriate conditionality, and the presence of endogenous terms of trade adjustment puts greater weight on investment conditionality.

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I. Introduction

The international capital market is presently characterized by effective credit rationing to developing countries. Most developing countries cannot obtain new credits from the international banking system. This situation is in sharp contrast with the 1970's, when the international banking system engaged willingly in substantial resource transfer to the developing countries. This remarkable switch from a functioning international credit market to a market characterized by credit rationing reflects the growing awareness of the country risk involved in further lending to developing countries. Most developing countries have reached a point where their willingness or ability to service their debt is questionable, thereby increasing the reluctance of the international banking system to extend new credits. This situation is further complicated by the drop in export prices experienced by the developing nations in recent years, a process that has further reduced their ability and willingness to service their debt.

A significant literature has evolved in recent years which attempts to study the unique characteristics of international country risk. The lack of simple enforcement mechanisms for international debt repayment tends to degenerate the international credit market into an equilibrium where the volume of international credit is limited by the effective penalties associated with defaults. These penalties are potential embargoes that would restrict the flow of both temporal and intertemporal trade (i.e., trade in goods and financial assets, respectively).[1]

While the above literature has provided clues regarding the problems of country risk, it has raised important policy questions of what can be (or should be) done in the present situation characterized by "over-borrowing" and debt overhang.[2] An open question is the degree to which the international system will be capable of revitalizing the resource transfer for investment purposes from the developed to the developing nations.

The purpose of this paper is to identify conditions under which renewed lending may benefit both the developed and the developing countries. We evaluate how the presence of endogenous terms of trade effects--that is, a situation in which terms of trade between debtor and creditor nations are significantly affected by the financial flows between them--affects the conditions for the existence of beneficial lending. This analysis has special relevance because a competitive international banking system does not internalize terms of trade effects, and may not revitalize lending for investment purposes, even in situations in which renewed lending is socially desirable. This may suggest an important role for policy-makers in imposing the appropriate conditionality (i.e., by imposing guidelines regarding the domestic policies that should follow renewed lending). We will attempt to evaluate conditions under which such a role is desirable.

We start our analysis by reviewing the behavior of the terms of trade of developing nations in recent years. The relevance of terms of trade effects for the debt situation depends mainly on the existence of a less than perfectly elastic demand for developing countries' exports. Existing econometric studies conclude that developing countries face a downward-sloping demand curve for their exports, at least when taken as a group. In addition, the sharp

deterioration in terms of trade of debtor countries since the start of the debt crisis, and the recent behavior of commodity prices suggest the existence of a strong connection between terms of trade changes and the debt situation.

We continue our analysis by describing a model of the international credit market which is characterized by insolvency on the part of debtor countries. This means that repayments do not suffice to cover all obligations, and therefore become more closely related to available resources in the debtor economy than to existing debt. As a consequence, the debtor countries cannot borrow as much as they would like to[3], and find themselves credit rationed. In these circumstances, we assume that debtors and creditors negotiate 'contracts' that offer increased lending based on some conditions on the use of the resources agreed to by the debtor country, and on the extent of the attachment of the debtors output to repayment. This simple framework is intended to capture some of the main features of the current rescheduling negotiation process.

The debt negotiations are assumed to take place in the context of a two-period, two-good world economy composed of two blocks of nations: creditors and debtors. Each block produces one good, and consumes both. In the first period, debtors and creditors try to reach a deal, or contract, to increase lending. The contracts are defined as a resource transfer to the developing nations in the first period that specifies a marginal propensity to invest out of the transfer and a marginal propensity to repay out of the proceeds of the new investment in the second period. A contract is a 'Pareto-improving contract' if both blocks of nations benefit from the marginal resource transfers. We obtain the conditions for the

existence of Pareto contracts, and describe them.

In the absence of terms of trade effects (perfect substitutability between the two goods) the key results can be summarized in the following way. The condition guaranteeing the existence of Pareto contracts is that the marginal productivity of capital in the developing countries should exceed that in the developed countries. In the absence of distortions (other than the international credit market insolvency situation) this condition is identical to the requirement that the interest rate be higher in the developing than in the developed nations. The larger the excess of the marginal productivity of capital in the developed countries, the larger the range of Pareto contracts. The presumption is that this condition is indeed satisfied because the interest rate in the heavily indebted countries tends to be higher than in the industrial countries. Nevertheless, in a real world situation, the marginal resource transfer will not occur in the absence of either appropriate incentives or conditionality on the debtor country.

We turn then to the analysis of the consequences of endogenous terms of trade adjustment due to limited goods substitutability on the region of Pareto contracts. We show that the Pareto region is enlarged for strict conditionality contracts (contracts that require high marginal propensity to invest in the debtor country) and is reduced for contracts requiring low marginal propensity to invest on the part of the debtor country. We also analyze an alternative type of contract between debtors and creditors. In this case the amount of the repayment is the only variable to be agreed upon, and investment is assumed to be undertaken in an optimal manner by the developing country. We show how, in this framework, the existence of endogenous

terms of trade modifies the region of Pareto-improving contracts.

It is noteworthy that the terms of trade effect is not internalized by the international banking system. This has the consequence that in the negotiation process the interests of the banking system may diverge from those of a representative consumer in the creditor country. This possibility may suggest an important role in the debt renegotiation process for governmental institutions that may provide the international banking system with the proper incentives needed to implement the desirable contracts.

II. The Empirical Relevance of Terms of Trade Effects

The relevance of terms of trade effects for the debt situation depends on the answer to the following question: do debtor countries face a downward-sloping demand curve for their export products? There are two reasons to believe that they do. The first is that although perhaps all debtor countries can be considered small economies, often they are all simultaneously affected by the same shocks, and their joint response is of a large magnitude. For example, the increasing unavailability of foreign borrowing since 1982 affected most debtor countries; their response included a generalized increase in exports, and a terms of trade deterioration followed.[4] This means that even if the actions of each individual debtor country cannot affect its terms of trade, on occasions the debtor country may find falling prices every time it tries to increase the volume of its exports because other debtor countries are doing the same.

The second reason is that an increasing portion of debtor countries' exports are manufactured products, the markets for which are, in many cases, well described by a differentiated products structure. In a differentiated-products framework (such as Spence (1976))[5] there is a whole continuum of goods that can be produced by a given industry, each of them differing only slightly from the point of view of consumers' preferences. With increasing returns, each firm will specialize in a different product on the continuum, and it will command a certain degree of market power.[6] If this is the case, the manufactured exports from debtor countries will face a downward-sloping demand curve, irrespective of size considerations.

Econometric studies of the elasticity of demand for developing country exports by industrial economies have usually taken developing countries as a group. Estimates of this import demand elasticity range from somewhat less than 1 to over 4.[7] The studies use, however, different aggregations for the definition of the import commodity, and different aggregations for the importer economy, apart from different sample periods. Despite that fact, it appears that a number slightly above 1 is a reasonable synthesis of econometric estimates of import demand elasticity. It is interesting to note that the median (across products) elasticity estimated by Grossman (1982) is equal to 1.2, the median (across countries) elasticity estimated by Marquez and McNeilly (1987) is also equal to 1.2, and the elasticity estimated by Dornbusch (1985) for the aggregate of non-oil developing countries is also equal to 1.2.[8] Such a figure is also in line with estimates of import price elasticities for industrial goods irrespective of the country of origin of exports (see Goldstein and Khan (1985)). This elasticity applies, however, to the aggregate of

developing country exports, although for some particular goods, a few exporters account for most of the supply.

In fact, the evolution of the terms of trade of the group of fifteen heavily indebted countries appears to reflect quite strongly the debt problems faced by them since 1982, as suggested by the data displayed in Table 1. Since 1982, the combined non-interest current account for this group of countries displays a sharp turnaround. The non-interest current account, that averaged a *deficit* of over $2 billion in the period 1968-81, moved to an average *surplus* of over $32 billion during 1982-87. This turnaround reflects the loss of access to international credit from private sources of many debtor countries. At the same time, these fifteen debtor countries experienced a sharp deterioration in terms of trade, a cumulative 22 percent relative to 1981 levels. Despite that deterioration, the volume of exports showed a cumulative increase of over 10 percent in the same period.

In addition to the general picture portrayed by Table 1, there are other pieces of evidence that indicate an interaction between the foreign debt situation and terms of trade developments. One of these is the behavior of the prices of non-oil commodities produced by developing countries. Despite continuous economic expansion in industrial countries the relative price of non-oil commodities fell sharply since 1983. Econometric studies have often found that non-oil commodity prices can be explained well by business cycle developments in industrial countries and the dollar exchange rate (see Dornbusch (1985)). However, since 1983, there appears to be break in traditional relationships, (Morrison and Wattleworth, (1987)). Chart 1, that plots an index of industrial production and the relative price of non-oil commodities since 1975, also suggests the existence of such

break in the relationship between these two variables.

An additional piece of evidence concerns the differentiated products argument. A large part of the increase in debtor countries' exports since 1982 consisted of manufactures, among which there are a number of goods which can easily fit the differentiated products description. Although disaggregated data on price and quantity indices of industrial exports are hard to obtain, there exists published information in the case of Chile. These data do show large increases in the volume of industrial exports accompanied by sharp drops in prices, as displayed in Table 2. Since 1982, the volume of manufactured exports grew by a cumulative 76 percent. However, this growth required deep cuts in prices, and the dollar prices of manufactured exports fell by a cumulative 36 percent. Relative to the prices of manufactures exported by industrial countries, the fall in export prices is even larger. Relative to the unit value index of their own imports, however, the decrease is smaller, which is partly explained by the decrease in commodity prices and in prices of exports originated in other developing countries. In addition, we conjecture that there might be a quality effect hidden in the data. As imports became more expensive and real income adjusted downwards, there might have been a switch towards lower quality products in imports. This interpretation is suggested by a disaggregation of import price data, which shows a very sharp decrease in the prices of consumption good imports, and only a slight decrease in the prices of capital good imports.

III. A Framework of Analysis

The purpose of our analysis is to identify conditions under which an increase in the resource transfer from developed to developing countries would be beneficial, and to study the consequences of endogenous terms of trade adjustment. The simplest framework to deal with these issues is a two-period, two-good world economy composed of two blocks of nations: developed and developing nations. Each block produces one good, and consumes both. For simplicity of exposition it is convenient to assume that in the long-run the relative price of the two goods is exogenously fixed by the technology of production. In the short-run the supply is given, and the relative price of the two goods is determined by the prevailing demand conditions. We will identify the short run with the first period, and the long run with the second.

On the supply side, let X and Y denote the good produced by the developed and the developing nations, respectively. Let $\bar{X}_i$ and $\bar{Y}_i$ denote the output level of the two goods in period i, i=1,2. The output level is exogenously given in period one. In the second period, the output level is determined by investment carried out in period one, which is denoted by I. We assume an asymmetric environment: good X can be either consumed or invested to increase the future output of both good X and Y, while good Y can only be used for consumption purposes. The investment technologies also differ. In the developed economy, second-period output is linked to investment according to:

$$d\bar{X}_2 = (1+r)\, dI$$

where I refers to investment in the production of good X by the developed economy, and r is the interest rate in the developed country. Thus, optimality conditions ensure that the marginal product of capital is always equal to the interest rate in the developed economy. The supply level of a good is indicated by a bar over its name. In the debtor economy, investment translates into output according to:

$$d\bar{Y}_2 = m(I^*)\, dI^*$$

where I^* refers to the use of good X for investment purposes in the developing country, and m is a function of the volume of investment, displaying decreasing returns. We do not make the assumption that the marginal product of capital equals the interest rate in the developing economy. Instead, the volume of investment is determined by an economic authority, and it is the subject of bargaining between debtor and creditor. Specifically, we assume that a fraction β is invested out of every extra dollar of net borrowing:

$$\frac{dI^*}{dB} = \beta \qquad (1)$$

and that the value of β is subject to debt negotiations. In fact, the actual subject of the debt negotiations could be an economic policy package for the debtor economy, which contains a set of measures (say taxes and subsidies) that ensure that the level of investment in the economy is consistent with the given value of β.

Note that the domestic interest rate in the debtor country (which we will denote by r^*) will not be equal to the interest rate in the creditor country, r. This is a consequence of the situation of insolvency which we assume the debtor country to be in. This situation implies that, in period one, the debtor country can obtain net foreign resources only up to a certain limit B, which it cannot control. Thus, if this is a binding constraint, the debtor country is credit-rationed, and r^* will exceed r.

The situation of insolvency also implies that repayments by the debtor country will fall short of its obligations and will thus be linked the debtor's capacity to pay. Specifically, we assume that, in period two, the debtor country repays an amount R which is linked to its available resources by:

$$\frac{dR}{d\tilde{Y}_2} = \chi \qquad (2)$$

The value of χ is determined by negotiations between the debtor country and its creditors. We assume that there exists previous indebtedness, contracted before period one, of a level that is larger than any value that R can attain. Note that this also implies that R can be larger or smaller than (1+r)B. In the absence of credit rationing and insolvency, interest rates would be equalized, and repayment would equal total existing debt (plus the corresponding interest).

Let $P_{z,i}$ denote the price of good z in period i, where z = X,Y, and i = 1,2; and by Q_i ($= P_{Y,i}/P_{X,i}$) the relative price in period i. It is convenient to use good X as the numeraire, normalizing $P_{X,1}$ to

one. We will assume that the future relative price of the two goods is constant, say $Q_2 = 1$.[9] The motivation is basically to concentrate on the terms of trade effects in the first period, when the flow of international resources is from the developed country to the developing country. The budget constraints faced by the developing country are:

$$X_1^* + QY_1^* + \frac{X_2^* + Y_2^*}{1+r^*} = Q\bar{Y}_1 + B - I^* + \frac{\bar{Y}_2 - R}{1+r^*} \qquad (3)$$

$$X_1^* + QY_1^* = Q\bar{Y}_1 + B - I^* \qquad (4)$$

where all variables are defined in terms of good X, B stands for net borrowing by the developing nations from the developed nations in period one, R stands for the flows of payments in the second period from the developing to the developed nation, and r^* is the domestic interest rate in the debtor economy. Stars identify a variable as corresponding to the debtor country. Q is used as shorthand for Q_1. Equation (3) is the standard lifetime budget constraint faced by the representative agent in the debtor country. In addition, the credit constraint puts a separate restriction on the debtor country in period one, namely that the debtor country cannot borrow beyond the exogenous limit B. This restriction is represented by equation (4).

Similarly, the budget constraints faced by the developed economy are:

$$X_1 + QY_1 + \frac{X_2 + Y_2}{1+r} = \bar{X}_1 - B - I + \frac{\bar{X}_2 + R}{1+r} \qquad (5)$$

$$X_1 + QY_1 = \bar{X}_1 - B - I \qquad (6)$$

1. Debt Negotiations

In this sub-section, we will discuss the existence of contracts that could make an increase in lending attractive to both debtors and creditors. We assume that negotiations may take place over the value of two parameters: β and χ, that is, over the proportion of new lending that is devoted to investment and over the proportion of the increase in debtor country's GDP that will be paid back to creditors. We will identify values of β and χ for which both the debtor and the creditor countries will find it worthwhile to engage in increased lending. In the presence of risk of debt repudiation, there are reasons to believe that the optimal contract may not be implemented by a competitive banking system. Consequently, it may be useful to identify conditions under which policy actions can lead to such contracts.

Let us assume that utility functions of the representative consumer in the developing and the developed countries are given by:

$$U^*(X_1^*, Y_1^*, X_2^*, Y_2^*) = u^*(X_1^*, Y_1^*) + \rho u^*(X_2^*, Y_2^*) \qquad (7)$$

$$U(X_1, Y_1, X_2, Y_2) = u(X_1, Y_1) + \rho u(X_2, Y_2) \qquad (8)$$

We can obtain the welfare effects on the creditor and debtor economies derived from increased lending by differentiating (7) and (8), and making use of the standard optimality conditions on the marginal rates of substitution, and of the budget constraints (the detailed derivation is presented in the Appendix):

$$\frac{dU^*}{dB}\frac{1}{u^*_{1,X}} = Y_1\frac{dQ}{dB} + 1 - \beta + \frac{\beta(1-\chi)m}{1+r^*} \qquad (9)$$

The first term in (9) measures the welfare consequences of the change in the terms of trade, given by the volume of exports ($Y_1 = \bar{Y}_1 - Y_1^*$) times the improvement in the terms of trade. The other terms reflect the increase in consumption. Consumption goes up in period one by $1-\beta$, and in period two by $m\beta(1-\chi)$. The second-period increase in consumption stems from an increase in output equal to βm, with a fraction χ of that increase being paid back to the developed countries.

The same procedure applied to the developed economy leads to:

$$\frac{dU}{dB}\frac{1}{u_{1,X}} = -Y_1\frac{dQ}{dB} - 1 + \frac{\beta\chi m}{1+r} \qquad (10)$$

Equation (10) shows that welfare in the developed countries changes in proportion to the amount of imports due to the terms of trade effect, decreases due to the direct drop in wealth resultant from the transfer, and increases due to the increase in repayment from the developing nation in the second period.

2. The Existence of Pareto-Improving Contracts

The international capital market setup is one in which the debtor country cannot service its obligations in full (or cannot be forced to). Its creditors may nevertheless be willing to provide additional resources, perhaps as a defensive strategy for previously contracted loans (Krugman (1987)). In this context, we assume that debtors and creditors bargain over the conditionality attached to any additional lending. This conditionality is summarized by the two parameters (β and χ) that determine investment and repayment.[10]

We will now try to identify the range of values of the parameters χ and β for which both blocks of nations could benefit from increased resource transfers to the developing nations. We will call this region the region of Pareto-improving contracts. A region of Pareto-improving contracts will exist if additional lending increases the world's total welfare. We can compute the global change in world welfare generated by an increase in international lending by adding up the welfare changes in each block, equations (17) and (18):

$$\frac{r^* - r}{(1+r)(1+r^*)}\,\beta\chi m + \beta\left(\frac{m}{1+r^*} - 1\right) \qquad (11)$$

The first term measures the consequences of shifting resources from developed to developing nations. It is proportional to the interest rate differential, and to the marginal investment rate in the developing nations (β). This corresponds to the fact that resources are being transfered from a low to a high interest rate country, where more productive investment projects exist. The second term measures the potential distortion in the capital markets of the developing

nations. In the absence of distortions--other than the international credit market situation--this term is zero, because investors will equate the marginal product of capital (m) to the interest rate $(1+r^*)$. In the presence of distortions, the term in brackets is a measure of the distortion wedge, and the change in welfare is proportional to the distortion times the change in the distorted activity (β).[11] Note that the overall change in world welfare is proportional to the marginal investment rate in the developing country. If no new investment is triggered by the transfer there are no aggregate wealth changes.

We start our analysis considering the limiting case in which the two goods are perfect substitutes $(dQ/dB = 0)$, and we will later evaluate the consequences of imperfect substitutability on the region of Pareto contracts.

3. Pareto-Improving Contracts with Perfect Substitutability

To obtain the region of Pareto-improving contracts we start by tracing an indifference curve on the (β,χ) plane. This curve is the locus of the pairs of values of β and χ for which the country is indifferent with respect to (marginal) additional lending. The curve forms the boundary of the region where the country benefits from a marginal increase in the resource transfer. Applying the same procedure to the two countries allows us to identify the conditions under which the region of (χ,β) where both countries will benefit from resource transfer is not empty.

The configurations of χ and β for which the developing nations

are indifferent with respect to increasing credit in the margin are obtained from (9):

$$\beta = \frac{1}{1 - \frac{m(1-\chi)}{1+r^*}} \qquad (12)$$

Equation (12) defines the curve DD in Figure 1. In Figure 1, a point like H corresponds to a contract that increases the credit available to the developing countries under the conditions that a fraction β_H of the marginal credit is devoted to investment and that a fraction χ_H of the increase in future output is paid to the developed countries. All points to the southwest of DD form the region for which the developing countries benefit from an increase in the resource transfer.[12] Therefore, as long as $0 < \chi, \beta \leq 1$, the developing countries benefit for all possible contracts.[13]

The parallel condition for developed countries is given by:

$$\chi\beta = \frac{1+r}{m} \qquad (13)$$

This condition defines curve CC (Figure 1), drawn for the case in which the marginal productivity of investment in the developing nations exceeds the interest rate in the developed nations. All points to the northeast of CC form the region for which the developed countries will benefit from an increase in resource transfer. The interpretation of (13) is straightforward. An increase in lending in period one of one dollar generates an increase in payoff in period two of $\beta m\chi$. That implicit rate of return is compared to the domestic rate r to determine the convenience of increasing lending.

The area between the two curves in Figure 1 defines the Pareto contracts. The condition that guarantees the existence of Pareto-improving contracts is that the marginal productivity of capital in the developing countries exceeds that in the developed countries. The greater is the excess of the marginal productivity of capital, the greater is the area of Pareto contracts.

There is a strong presumption that this condition for the existence of Pareto-improving contracts is indeed satisfied in the real world, because interest rates in heavily-indebted countries tend to be much higher than in creditor countries, and presumably the divergence of the marginal product of capital with respect to the interest rate is not so large. However, also in a real world situation, the marginal resource transfer will not occur in the absence of proper incentives or of conditionality on the debtor country to satisfy the terms (β,χ) of the contract.

4. Pareto-Improving Contracts with Imperfect Substitutability

Under limited goods substitutability, an increase in the resource transfer will have some impact on terms of trade. In the next section, we develop a model that determines the terms of trade effect explicitely. In the meantime, an approximate analysis can be made using only information on the sign of dQ/dB.[14]

From (9) and (10) we obtain the new boundaries of the sets of contracts that are advantageous to the debtor and the creditor country, respectively:

$$\beta = \frac{1 + Y_1 \frac{dQ}{dB}}{1 - \frac{m(1-\chi)}{1+r^*}} \qquad (14)$$

$$\beta = \frac{1 + Y_1 \frac{dQ}{dB}}{\frac{\chi m}{1+r}} \qquad (15)$$

Consider first the case in which $-1 < dQ/dB < 0$. Both the CC and DD curves shift towards the origin. The set of contracts for which developing countries are willing to receive additional resources is in fact smaller. Some contracts in the upper-left part of the unit square are no longer beneficial because the welfare effect of the terms of trade deterioration offsets the additional consumption possibilities generated by the increased lending. In contrast, the set of contracts for which developed nations are willing to increase lending is now larger, because the existence of a relative price effect is favorable to the developed countries.

We conclude that a deterioration in the terms of trade of developing countries has the consequence of shifting the location of the Pareto region leftwards and downwards. This means that the developed countries may obtain "softer" conditionality terms, because part of the economic repayment is implemented via terms of trade adjustment. This effect would be larger the lower is the substitutability between the two goods. It is noteworthy that from the point of view of the banking system the curve CC continues to be the relevant contract indifference curve. This has the potential consequence that at the negotiation process the interests of the banking system may diverge from those of the other parties. There

exist some contracts that are Pareto-improving but are associated with losses to the banking system. This possibility suggests an important role in the process for policy actions to provide international banks with the proper incentives needed to implement such contracts.

Consider now the case of dQ/dB positive. Both the CC and DD curves will shift outwards. The developing countries will now be willing to accept some contracts that produce a negative payoff when evaluated at the domestic interest rate, because the terms of trade improvement more than compensate for that. From the point of view of creditor countries, however, the set of beneficial contracts is now smaller. This would be a situation in which the creditor country would attempt to regulate banks in order to restrain them from increasing lending under some contracts that generate profits for the banks but make the creditor country worse off.

Consequently, the impact of endogenous terms of trade is determined by the direction of the terms of trade adjustment to the marginal increase in credit. We now turn to study the factors determining the sign of dQ/dB.

5. A Model Linking Terms of Trade to International Lending

The framework of lending and investment is as described above, and the budget constraints (3) to (6) apply. We assume that the demand structure in the developed nation can be summarized by:[15]

$$X_1 = E_1 g(Q); \quad QY_1 = E_1(1-g(Q)) \tag{16}$$

$$X_2 = E_2 g(1); \quad Y_2 = E_2(1-g(1)) \tag{17}$$

$$E_2 = \rho(1+r)E_1 \tag{18}$$

where E_i is total expenditure in period i ($E_i = X_i + Q_i Y_i$). The function g(Q) determines the distribution of expenditure between the two goods as a function of the relative price.

The demand functions for the developing world are entirely symmetrical. However, we assume that each country may consume a larger proportion of the domestically produced good. This can be represented by:

$$X_1^* = E_1^* ag(Q); \quad QY_1^* = E_1^*(1-ag(Q)) \tag{19}$$

$$X_2^* = E_2^* ag(1); \quad Y_2^* = E_2^*(1-ag(1)) \tag{20}$$

$$E_2^* = \rho(1+r^*)E_1^* \tag{21}$$

where $a \leq 1$. The parameter a measures the domestic bias in consumption.[16] To simplify further, it is useful to consider the special case in which the g functions are given by:[17]

$$g(Q) = hQ^{\alpha}, \quad h < 1 \tag{22}$$

Therefore, α is equal to the elasticity of demand with respect to the relative price of the two goods.

Regarding investment demand, we assume an assymetric structure. In the creditor country, there exists a linear technology that transforms investment into output $d\bar{X}/dI = 1+r$, r being a technological constant.[18] Therefore, in the creditor country, investment is the

variable that adjusts to support the savings/investment/current account balance. By contrast, in the debtor country, investment is determined by the economic authority, as explained above.

6. Adjustment to an Increase in Net Borrowing

Given the demand and supply structure detailed above, the equilibrium of the system can be represented in the following way. In period one, with the credit constraint binding, consumption in the debtor country cannot exceed the exogenous limit $Q\bar{Y}_1 + B - I^*$. The domestic interest rate adjusts to obtain that level of consumption. The distribution of consumption across goods is given by (19) and (20). In the developed economy, consumption is set according to the level of wealth but, given the exogeneity of B, the investment level I has to adjust to satisfy the first-period budget constraint. This is of no consequence, because of the linear technology. Market-clearing in the first period is then given by:

$$\tilde{X}_1 = \left(Q\tilde{Y}_1 + B - I_Y\right)ag(Q) + \left(\tilde{X}_1 - B - I_X\right)g(Q) + I + I^* \qquad (23)$$

$$Q\tilde{Y}_1 = \left(Q\tilde{Y}_1 + B - I^*\right)(1-ag(Q)) + \left(\tilde{X}_1 - B - I\right)(1-g(Q)) \qquad (24)$$

In the second period, there is effectively only one good, since supply can costlessly accomodate any combination of X and Y. Then, there is only an income/expenditure equilibrium condition in each country. Given the credit constraints, second period consumption, which is determined according to the intertemporal conditions (18) and

(21) equals:

$$Y_2^* + X_2^* = \rho(1+r^*)\left[Q\bar{Y}_1 + B - I_Y(r^*)\right] \tag{25}$$

$$X_2 + Y_2 = \rho(1+r)\left[\bar{X}_1 - B - I_X\right] \tag{26}$$

And consumption must equal income in each country, which is given by production and repayment:

$$\bar{Y}_2(I^*) - R(\bar{Y}_2) = \rho(1+r^*)\left[Q\bar{Y}_1 + B - I^*\right] \tag{27}$$

$$\bar{X}_2(I) + R(\bar{Y}_2) = \rho(1+r)\left[\bar{X}_1 - B - I\right] \tag{28}$$

Equilibrium can then be represented by equations (23), (or (24)), (27), and (28). These equilibrium conditions determine the value of the following endogenous variables: the first period terms of trade, the interest rate in the developing countries, and investment in the developed countries (Q, r^*, and I). The levels of net borrowing B, and of investment by the debtor country I^* are exogenously determined in the debt negotiation process.

Suppose now that the developed nations initiate a marginal increase in the available credit ($dB > 0$), and let us evaluate the normative and positive aspects of the adjustment to such an increase in lending. The response of the terms of trade to the increase in lending, evaluated at $Q = 1$, is equal to:[19]

$$\frac{dQ}{dB} = \frac{1}{\Omega}\left[-(1-h)\frac{dI+dI^*}{dB} + (1-a)h(1-\beta)\right] \tag{29}$$

with $\Omega = ah\bar{Y}_1 + \alpha h(aE_1^* + E_1)$. This expression is positive for values of β that are in the Pareto region defined above curve CC (i.e. for $\beta\chi m/(1+r) > 1$). The change in investment is given by:

$$\frac{dI^* + dI}{dB} = \beta - 1 - \frac{1}{1+\rho}\left(-1 + \frac{\chi m \beta}{1+r}\right) \qquad (30)$$

Consider the case of $a = 1$.[20] The homothesticity of utilities and the absence of a local habitat effect imply that wealth increases or welath redistributions will not affect the relative price Q. Therefore, the change in investment in the two countries will determine the change in terms of trade. From (30), it can be seen that the change in I^* is given by β, while the change in I is a one-for-one fall with the increases in lending and in consumption, where the latter is proportional to the change in wealth in the creditor country: $-1 + \frac{\chi m \beta}{1+r}$.

Note that (30) implies that, when $\chi m\beta/(1+r) = 1$ (which defines curve CC, i.e. the lower bound of contracts acceptable to the creditor when terms of trade do not change), for $\beta = 1$ there is no change in aggregate investment and thus in Q, for $\beta < 1$ aggregate investment and Q fall, and for $\beta > 1$, aggregate investment and Q increase. This means that only when investment in the debtor country increases more than one for one with increases in borrowing will terms of trade turn in favor of the creditor country.

We can now use (14), (15), and (29) to determine the region of Pareto-improving contracts. The new boundary for the creditor country is defined by:

$$\beta = \frac{1 + \frac{Y_1}{\Omega}\left[\frac{(1-h)\rho}{1+\rho} + (1-a)h\right]}{\frac{\chi m}{1+r}\left[1 - \frac{Y_1(1-h)}{\Omega(1+\rho)}\right] + \frac{Y_1}{\Omega}\left[(1-h) + (1-a)h\right]} \qquad (31)$$

This means that with imperfect substitutability ($\Omega < \infty$), the curve CC rotates to a position like C'C'(see Figure 2). For values of $\beta < 1$, the terms of trade move in favor of the debtor economy, and this fact excludes some contracts that would be beneficial without the relative price change. Note that, for $\beta < 1$, there is now a region (labeled region A) of contracts that are profitable for banks (whose relevant cut-off continues to be still CC), but not for the representative consumer in the creditor country. At $\beta = 1$ the two curves overlap because, as can be seen from (29), there would be no change in terms of trade. For values of $\beta > 1$, the terms of trade change in favor of the developed economy, and a typical consumer in the developed economy would benefit from contracts that are not acceptable to banks, such as those in region B.[21]

Therefore, accounting for imperfect substitutability between goods produced by different countries changes the conditions under which a beneficial increase in lending may exist and creates a divergence of opinion between international banks and a representative consumer in the creditor country. In the context of the present model, this divergence of opinion can be summarized in the following way: for contracts with "softer" investment conditionality ($\beta < 1$), banks are more likely to find opportunities for increased lending, but the creditor country will find convenient contracts with "harder" investment conditionality ($\beta > 1$) and smaller repayment (χ) that actually produce losses to creditor banks.

7. An Alternative Framework [22]

The model above assumed that debtors and creditors negotiate over the addition to investment (β) and to repayment (χ) that should be attached to an increase in lending. Such framework appears to be in line with observed behavior in the recent rescheduling negotiations. Often in those negotiations, some conditionality on the debtor country's policies--usually within the framework of a Fund-supported program--is part of the agreement. In the model this policy conditionality is represented as a certain value for the composition of spending, that is, the value of the parameter β. In addition, negotiations determine how much is paid and how much is rescheduled, a decision that is highly dependent on the economic performance of the debtor. In the model, this is represented by the parameter χ.

It can be argued, however, that negotiating over (β,χ) is not the best policy for the creditor. The creditor could leave the investment decision entirely up to the debtor, which (in the absence of distortions in the debtor economy) would maximize second-period output if the proper incentives are in place. In order to provide such proper incentives, repayment should be agreed as a fixed amount, because then the debtor can keep the return to any increase in investment that it achieves.[23]

The alternative framework for negotiations would therefore not attach policy conditionality to the increased lending. In the absence of domestic distortions, investment in the debtor economy would therefore be determined by equating the marginal product of capital to

the domestic interest rate r^*. The new contract being negotiated would simply determine the marginal repayment that will follow the increase in lending, which we will denominate Z. That is, Z is defined by:

$$Z = \frac{dR}{dB} \tag{32}$$

The equilibrium of this system is essentially the same as the one above. It is still represented by equations (23), (27), and (28), but now the effect of an increase in lending has to consider (32) and that investment in the debtor economy will be given by:

$$\frac{d\tilde{Y}_2}{dI^*} = m = 1 + r^* \tag{33}$$

$$\frac{dI^*}{dr^*} = \frac{1}{m'} < 0 \tag{34}$$

where $m = m(I^*)$. The effect on terms of trade of an increase in lending can now be computed:

$$\frac{dQ}{dB} = \frac{1}{\Delta}\left[\Gamma\left((1-h)\frac{\rho(1+r)+Z}{(1+\rho)(1+r)} + h(1-a)\right) - \frac{1-ah}{m'}\left(\rho(1+r^*)+Z\right)\right] \tag{35}$$

where:

$$\Delta = \Omega\Gamma + \frac{1-ah}{m'}\rho(1+r^*)\tilde{Y}_1 > 0$$

$$\Gamma = \frac{(1+r^*)(1+\rho)}{m'} - \rho E_1^* < 0$$

and Ω is as defined under equation (29). It can be shown that $\frac{dQ}{dB}$ is positive for all relevant values of a.

The region of Pareto-improving contracts can now be determined. This region only refers to values of Z. If there are no changes in terms of trade, it is clear that the creditors would not accept any contract unless it sets $Z > 1+r$, and debtors would not accept any contract unless it sets $Z < 1+r^*$. As before, $r^* > r$ is the necessary condition for the existence of a non-empty Pareto-improving region. In Figure 3 we plot the region of Pareto-improving contracts as a function of α, which represents the degree of substitutability between the two goods. In the limit, as α goes to infinity and the two goods are perfect substitutes, there is no terms of trade effect, and the Pareto region is as described above. In contrast, for finite values of α, creditor countries require a value of Z exceeding $1+r$ to engage in further lending, and debtor countries accept a value of Z higher than $1+r^*$, because the terms of trade effect benefits the debtor country.

These results qualify the conclusions from the previous framework, in the sense that if investment is done in an optimal manner in the debtor country and debt negotiations provide the correct incentives to achieve such investment, there are no contracts that the creditor country would be willing to engage in that would not be achieved by a decentralized banking system. But, in addition, there is a set of contracts under which the decentralized banking system would engage in further borrowing that are not optimal from the point of view of the representative consumer in the creditor economy. Ultimately, the relevance of this and the previous framework depends on an explicit account of the reasons for credit rationing and

under-investment. We suspect that the existence of defensive lending, different time horizons between governments and the private sector, distorted capital markets, and asymmetric information make the conclusions of the former framework the more relevant ones.

IV. Concluding Remarks

This paper studied the conditions under which renewed lending to heavily-indebted countries could be advantageous for both creditor and debtor countries. In dealing with the debt overhang issue it is useful to distinguish between the redistributive versus the efficiency issues. The purpose of our analysis was to highlight the potential efficiency losses emerging from the drop in investment in the developing countries due to the presence of credit rationing, and to investigate mechanisms to revitalize the investment process. The analysis focused on the case where there are two dimensions for the conditionality: the determination of the marginal propensity to invest out of the new funds and of the marginal propensity to repay out of future output. We demonstrated the potential trade off between these two dimensions and pointed out that endogenous terms of trade adjustment gives greater weight to investment conditionality. We now close the paper with some interpretive comments regarding qualifications and extensions.

Our discussion demonstrated that (in the absence of strict investment conditionality) renewed lending to developing countries tends to be associated with an improvement in the terms of trade of the developing countries and vice versa. This is consistent with the

terms of trade deterioration observed in recent years. In the eighties, there was a switch from a regime that transferred resources to the developing countries to a regime that transfers resources from the developing countries. The importance of the terms of trade adjustment stems from the observation that it has first-order welfare effects on the consumers in the creditor and debtor nations, despite the fact that it is not internalized by the private banking system.

There are some qualifications to our results in this paper. The framework developed in the paper considers debt and credit rationing at the global level. Even if each indebted country has limited market power in its products, the group of indebted countries as a whole has significant market power. Because most indebted countries are facing presently similar constraints, we have used an aggregate version of a two-block world--creditors and debtors. However, if it is only the collective response of debtor countries that is large enough to produce terms of trade changes, individual debtor countries would not be willing to accept a less favorable contract in consideration of the terms of trade effect. If this is the case, the set of contracts acceptable to debtors is not changed by the existence of a terms of trade effect of increased lending. Another qualification is that it is not entirely clear that the decisions of economic authorities are consistent with the representative consumer's interest when it comes to issues such as terms of trade changes. It appears that the protection of import-competing industries in industrial countries may be, in fact, more important for the authorities.

This last point suggests an interesting extension to the present framework. Some consistency is required between the conditionality attached to renewed credit and commercial policies adopted in the two

blocks of countries, particularly in the creditor countries. Even in the absence of renewed lending, repayment of past loans will require consistent commercial policy (i.e., intensive application of quotas may defeat any sincere attempt for debt repayment). This suggests that the incorporation of commercial policy actions to the policies considered in the debt negotiation process could have important implications for the design of mutually advantageous debt contracts.

APPENDIX

Some Derivations

This appendix provides the details of the derivation of two expressions used in the main body of the paper. The first expression concerns the effects of increased lending on utility. Differentiating the utility functions (7) and (8) we obtain:

$$\frac{dU^*}{u^*_{1,X}} = dX^*_1 + dY^*_1 \frac{u^*_{1,Y}}{u^*_{1,X}} + dX^*_2 \rho \frac{u^*_{2,X}}{u^*_{1,X}} + dY^*_2 \rho \frac{u^*_{2,Y}}{u^*_{1,X}} \qquad (a1)$$

$$\frac{dU}{u_{1,X}} = dX_1 + dY_1 \frac{u_{1,Y}}{u_{1,X}} + dX_2 \rho \frac{u_{2,X}}{u_{1,X}} + dY_2 \rho \frac{u_{2,Y}}{u_{1,X}} \qquad (a2)$$

We assume that marginal rates of substitution are given by the standard optimality conditions:

$$\frac{u^*_{1,Y}}{u^*_{1,X}} = \frac{u_{1,Y}}{u_{1,X}} = Q \qquad (a3)$$

$$\rho \frac{u^*_{2,X}}{u^*_{1,X}} = \rho \frac{u^*_{2,Y}}{u^*_{1,X}} = \frac{1}{1+r^*} \qquad (a4)$$

$$\rho \frac{u_{2,X}}{u_{1,X}} = \rho \frac{u_{2,Y}}{u_{1,X}} = \frac{1}{1+r} \qquad (a5)$$

Making use of these marginal rates of substitution, we obtain:

$$\frac{dU^*}{u^*_{1,X}} = dX_1^* + QdY_1^* + \frac{1}{1+r^*}(dX_2^* + dY_2^*) \qquad (a6)$$

$$\frac{dU}{u_{1,X}} = dX_1 + QdY_1 + \frac{1}{1+r}(dX_2 + dY_2) \qquad (a7)$$

Differentiating the budget constraint (3), we obtain:

$$dX_1^* + QdY_1^* + Y_1^* dQ + \frac{1}{1+r^*}(dX_2^* + dY_2^*) - \frac{Y_2^* + X_2^* - (\bar{Y}_2 - R)}{(1+r^*)^2} dr^* =$$

$$= \bar{Y}_1 dQ + dB - dI^* + \frac{1}{1+r^*}(d\bar{Y}_2 - dR) \qquad (a8)$$

Note that $Y_2^* + X_2^* = \bar{Y}_2 - R$, because of the credit constraint, which means that the change in the interest rate in the developing nations (r^*) does not generate a direct wealth effect. In fact, neither the domestic nor the foreign interest rate affect wealth of the debtor country. This is a consequence of the credit rationing/insolvency situation. Because of credit rationing, the country as a whole does not have a net position on assets carrying the domestic interest rate r^*, and because of insolvency, repayments R are not linked to interest rates. With "normal", fully-integrated capital markets, an increase in the *world* interest rate reduces the borrower's wealth by the change in the interest rate times the external indebtedness position. The credit rationing and insolvency situation truncates this channel, because it de-links debt service from the world interest rate.

Finally, from (a6) and (a8), and making use of our assumptions regarding marginal investment and repayment rates in the debtor country, we obtain expression (9) in the paper, and an entirely

parallel procedure applied to the developed economy leads to equation (10):

$$\frac{dU^*}{dB}\frac{1}{u^*_{1,X}} = Y_1\frac{dQ}{dB} + 1 - \beta + \frac{\beta(1-\chi)m}{1+r^*} \qquad (9)$$

$$\frac{dU}{dB}\frac{1}{u_{1,X}} = -Y_1\frac{dQ}{dB} - 1 + \frac{\beta\chi m}{1+r} \qquad (10)$$

The second expression this appendix is concerned with is the change in the terms of trade generated by an increase in lending, dQ/dB. We recall that the system can be represented in the following way (the equation numbers are the same as in the paper):

$$Q\tilde{Y}_1 = \left(Q\tilde{Y}_1 + B - I^*\right)(1-ag(Q)) + \left(\tilde{X}_1 - B - I\right)(1-g(Q)) \qquad (24)$$

$$\tilde{Y}_2(I^*) - R(\tilde{Y}_2) = \rho(1+r^*)\left(Q\tilde{Y}_1 + B - I^*\right) \qquad (27)$$

$$\tilde{X}_2(I) + R(\tilde{Y}_2) = \rho(1+r)\left(\tilde{X}_1 - B - I\right) \qquad (28)$$

These equilibrium conditions determine the value of the following endogenous variables: the first period terms of trade, the interest rate in the developing nations, and investment in the developed countries (Q, r^*, and I). The levels of net borrowing B, and of investment by the debtor country I^* are exogenously determined in the debt negotiation process. Differentiating the system, at Q = 1, we obtain:

$$\frac{dQ}{dB}\bar{Y}_1 = (1-ah)\left(\frac{dQ}{dB}\bar{Y}_1 + 1 - \beta\right) + E_1^*\left(-a\alpha h\frac{dQ}{dB}\right) + \\ + (1-h)\left(-1 - \frac{dI}{dB}\right) + E_1\left(-\alpha h\frac{dQ}{dB}\right) \qquad (a9)$$

$$m\beta - \chi m\beta = \rho(1+r^*)\left(\frac{dQ}{dB}\bar{Y}_1 + 1 - \beta\right) + E_1^*\frac{dr^*}{dB} \qquad (a10)$$

$$(1+r)\frac{dI}{dB} + \chi m\beta = \rho(1+r)\left(-1 - \frac{dI}{dB}\right) \qquad (a11)$$

It can be seen that there is some recursivity in the system, in that the variable r^* can be determined after the rest of the system is solved. The role of r^* is only to ensure that spending in the debtor economy, E_1^* is equal to the resources avaiable in the first period, and only the level of E_1^* matters for the rest of the equilibrium. Collecting terms in (a11) we obtain:

$$\frac{dI}{dB} = \frac{-\chi m\beta - \rho(1+r)}{(1+r)(1+\rho)} \qquad (a12)$$

Using (a12) in (a9), we obtain:

$$\frac{dQ}{dB}\left(\bar{Y}_1 ah + \alpha h(E_1^* + E_1)\right) = (1-ah)(1-\beta) - (1-h) + (1-h)\frac{\chi m\beta + \rho(1+r)}{(1+r)(1+\rho)} \qquad (a13)$$

And some further transformations produce equation (29) in the paper:

$$\frac{dQ}{dB} = \frac{1}{\Omega}\left[-(1-h)\left(\beta - 1 - \frac{1}{1+\rho}\left(-1 + \frac{\chi m\beta}{1+r}\right)\right) + (1-a)h(1-\beta)\right] \qquad (29)$$

with $\Omega = ah\bar{Y}_1 + \alpha h(aE_1^* + E_1)$.

Footnotes

1 For an analysis of country risk see for example, Harberger (1976), Kharas (1981), Eaton and Gersovitz (1981), Sachs (1984), Kletzer (1984), Cohen and Sachs (1985), Dornbusch (1985), Krugman (1985), Smith and Cuddington (1985), Edwards (1985), Folkerts-Landau (1985), Dooley (1986), Aizenman (1986), Bulow and Rogoff (1986), Aizenman (1987), Helpman (1987), and Borensztein and Ghosh (1988).

2 The literature on "solutions" to the debt situation is also quite impressive. Important studies that summarize advantages and disadvantages of existing proposals include: Krugman (1985), Dornbusch (1987), Fischer (1987), Feldstein et al (1987), and Bergsten et al (1985).

3 That is, as much as it is necessary to equate the domestic interest rate to the international rate.

4 The link between real commodity prices and debt service is suggested in Feldstein et al (1987).

5 An extensive analysis of this market structure in the context of international trade can be found in Helpman and Krugman (1985).

6 Alternatively, the differentiation could arise from reputational or learning problems.

7 This range is taken from the survey included in Marquez and McNeilly (1987).

8 The estimates reported by Khan and Knight (1988) also lie between 1 and 2.

9 This would be consistent with an environment where there exists a technology in period two that costlessly transforms good Y into good X at a fixed rate (say one). The existence of credit rationing would prevent the exploitation of arbitrage opportunities. The assumption is also consistent with the idea that the second period represents a long-run position in the context of constant returns to scale and perfect competition.

10 We abstract from monitoring problems, assuming that contract conditions are perfectly enforceable.

11 Note that the consequence of credit rationing is 'under-investment' in the developing nations relative to the first best. The distortion wedge is measured by the interest rate differential. The change in welfare is the result of multiplying the distortion by the change in the distorted activity.

12 In fact, this requires $(1-\chi)m/(1+r^*) < 1$, which we assume to hold in the relevant range. It will always hold if, for example, $m = 1+r^*$.

13 But contracts with (β,χ) outside the unit square are also possible, and some of them benefit the debtor country.

14 This analysis is not fully correct because dQ/dB will itself depend on the parameters β and χ.

15 An example of a utility function that generates this type of demand function is:

$$U(X_1,Y_1,X_2,Y_2) = \ln\left(\frac{X_1^{1-\gamma}}{1-\gamma} + \frac{Y_1^{1-\gamma}}{1-\gamma}\right) + \rho\ln\left(\frac{X_2^{1-\gamma}}{1-\gamma} + \frac{Y_2^{1-\gamma}}{1-\gamma}\right)$$

16 The case of $a = 1$ corresponds to the case where there is no 'local habitat', and the demand functions are the same in both countries. The case of $a < 1$ corresponds to the case where each country prefers its own good.

17 We assume that the range of values of Q is such that $hg(Q) < 1$ always.

18 This linear technology serves the purpose of isolating intertemporal marginal rates of substitution in the developed economy from feedback from international lending to the developing world. Our analysis can be extended to the case where r is endogenously determined, without affecting the logic of our discussion.

19 The derivation is contained in the Appendix.

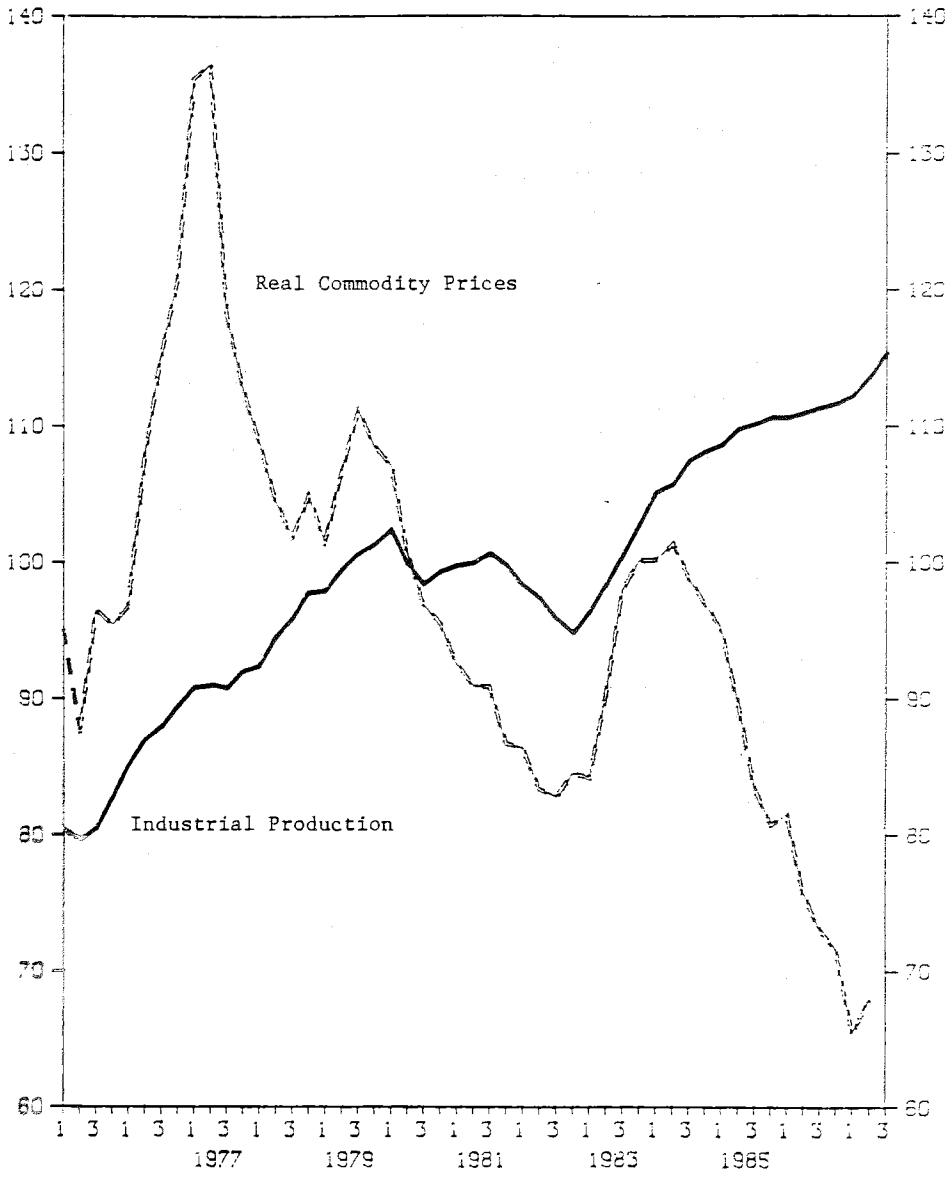
20 Note that, for $a < 1$, in the absence of new investment we get an improvement in the terms of trade of developing countries due to the "local habitat" effect. This is in line with the classical transfer criterion (for analysis using transfer considerations see Frenkel and Razin (1987) and van Wijnbergen (1988)). Note also that, with a unitary marginal investment ($\beta = 1$), the terms of trade adjustment is independent of any local habitat effect.

21 The closer substitutes goods X and Y are, the smaller the terms of trade change that would occur, and the smaller the shift in the CC curve. This can be seen from equation (32), where the elasticity of substitution is positively associated with Ω. Also, the larger the local habitat effect (smaller a) the larger the impact of the terms of trade change on the Pareto region (i.e. the larger the shift in CC).

22 We thank Elhanan Helpman and Assaf Razin for comments that led to this section.

23 In fact, the optimal policy for the creditor is dependent on the nature of uncertainty in the model, and on the possible existence of asymmetric information, as the results in Krugman (1987) and Froot, Sharfstein and Stein (1988) show.

Chart 1. Industrial Production and Real Commodity Prices[1/]



1/ Industrial production in industrial coutries and prices of non-oil commodities exported by developing countries deflated by prices of manufactures exported by industrial countries.
Source: IMF, International Financial Statistics.

Table 1. Fifteen Heavily Indebted Countries

	Terms of Trade	Export Volume	Non-Interest Current Account 1/
1981	100.0	100.0	-2.1 2/
1982	95.9	97.4	2.8
1983	92.5	100.2	31.5
1984	94.8	110.2	51.7
1985	92.9	112.4	50.7
1986	78.5	109.6	29.6
1987	77.5	107.5	31.0

Source: International Monetary Fund, World Economic Outlook.

1/ Current account, excluding investment income other than direct investment, in billions of dollars.
2/ Average 1968-81.

Table 2. Chile: Exports of Manufactures

	Index of Volume	Index of Price 1/	Index of Relative Price 3/	Index of Relative Price 3/
1981	100.0	100.0	100.0	100.0
1982	121.7	75.7	77.3	86.3
1983	137.2	69.0	72.5	87.2
1984	133.0	73.2	79.4	92.3
1985	148.7	60.1	64.4	76.4
1986	176.1	64.2	58.3	...
Cumulative Change 81-86	76.1	-35.8	-41.7	-23.6

Source: Banco Central de Chile, Boletin Mensual and Indicadores de Comercio Exterior.

1/ In current US$.
2/ Relative to Index of Industrial Countries Manufactures export prices (IMF: World Economic Outlook).
3/ Relative to Import Unit Values.

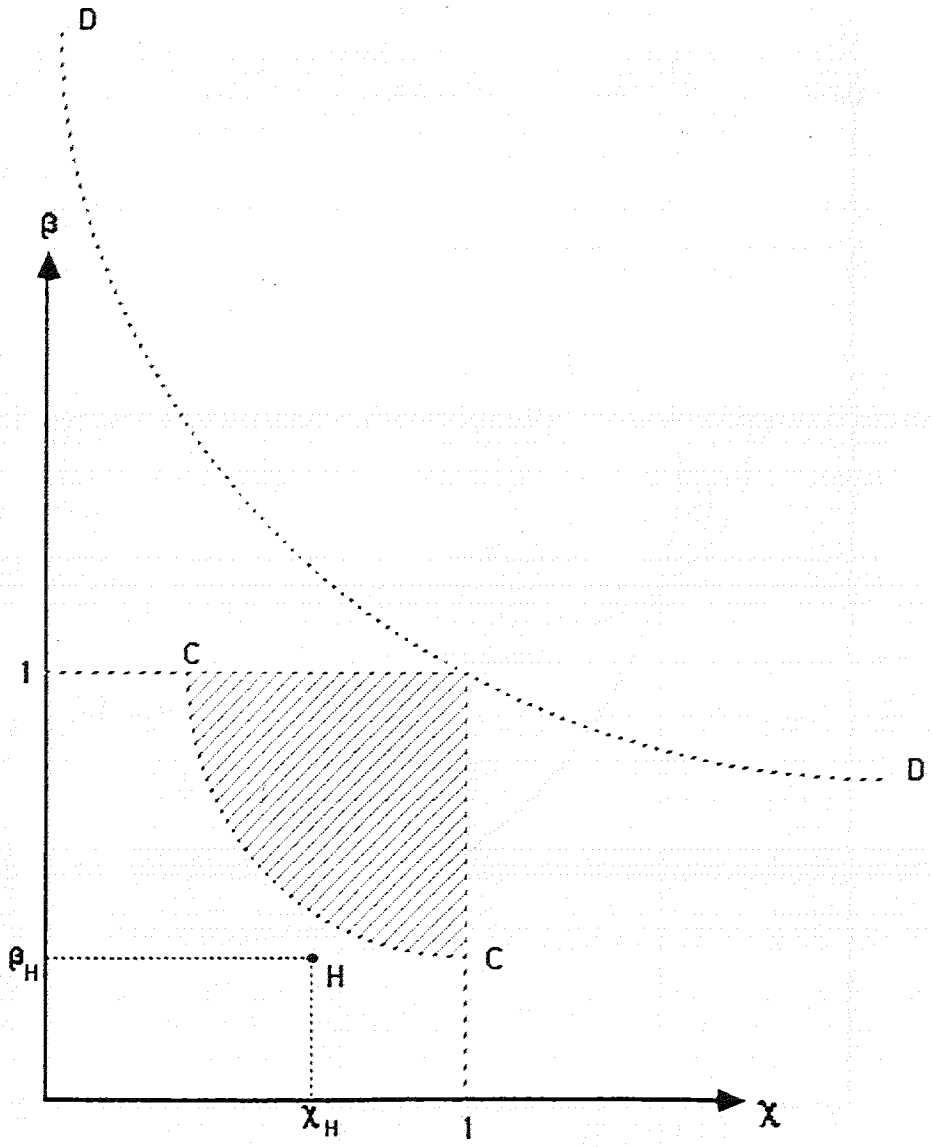


FIGURE 1

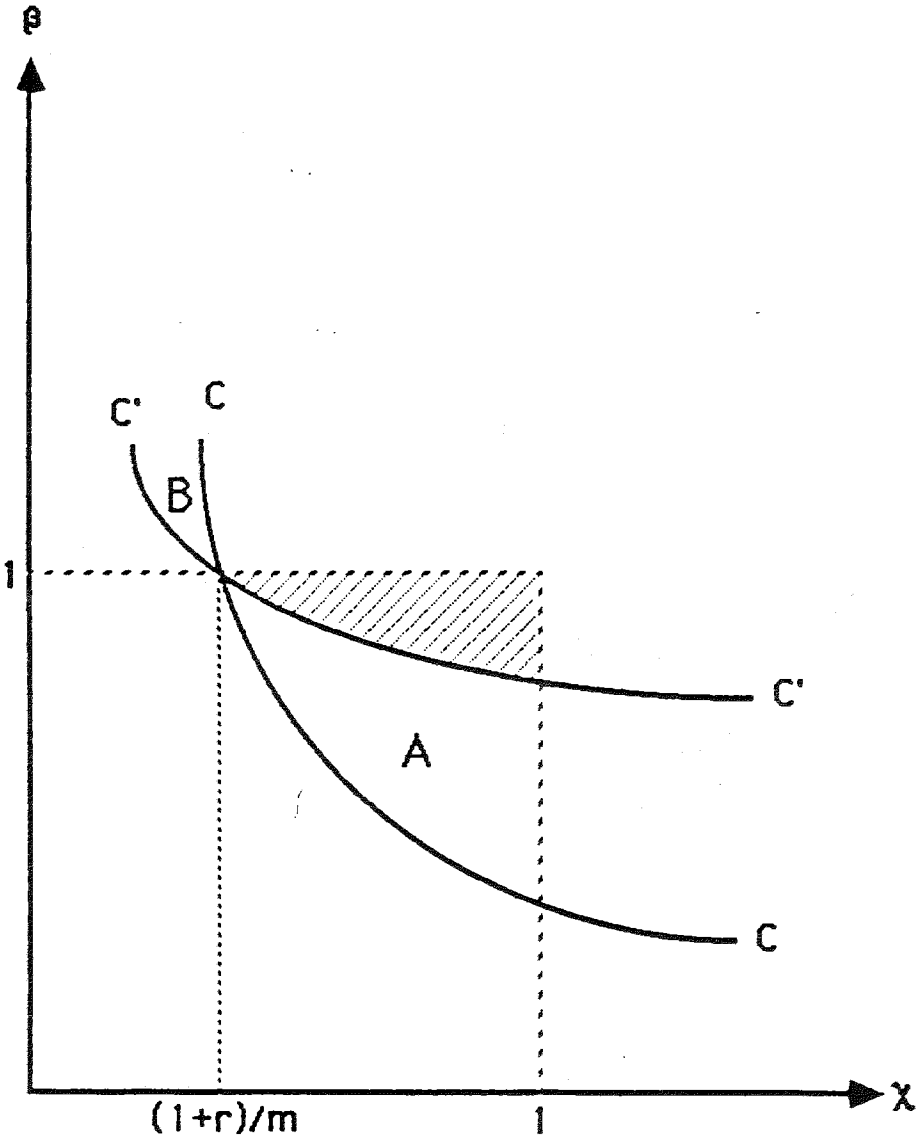


FIGURE 2

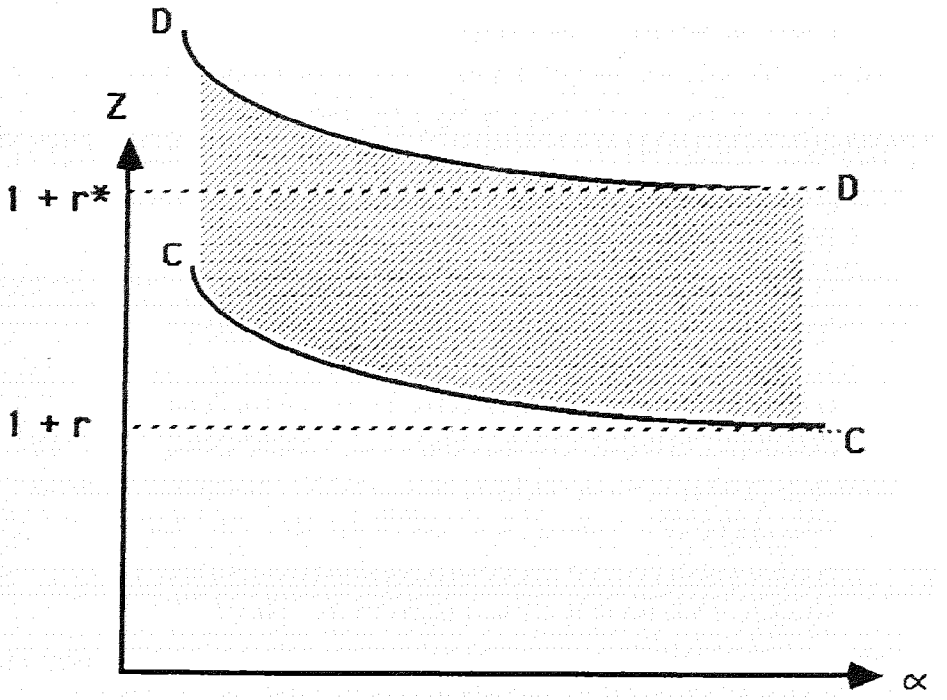


FIGURE 3

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