# INTERNATIONAL ECONOMIC LINKAGES AND THE INTERNATIONAL DEBT SITUATION

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## CONTENTS

# INTRODUCTION

"Coping with the debt crisis" was a major recurrent theme in international economic affairs during the 1980s. Managing the legacy of the crisis remains a major challenge of the 1990s, both for OECD creditor countries and for the debtor countries themselves.

During the 1980s, following the Mexican payments crisis of August 1982, a number of debt "plans" and "strategies" have been introduced, but overall progress has been slow; one major achievement, however, has been to avoid a major banking crisis. This article results from a project to investigate the relationship between macroeconomic developments in OECD countries and those in debtor countries'. From the light that this throws on the interaction of international linkages, including those between OECD macroeconomic policies and debtor countries, we can better understand why many of the hopes and expectations of these plans were not realised.

To analyse the relationship, between the macroeconomic environment, debt, and economic performance, the approach taken here was to build small macroeconometric models for Latin America (DEMOD) that are simulated in combination with the OECD world model, INTERLINK[2]. These models, whose broad structure is outlined in the Appendix and described more fully in Dittus and O'Brien (1990), take many variables from INTERLINK, analyse their impact on Latin America, and then provide feedback to the main system. This builds on the strengths of INTERLINK — its global character, providing explicit modelling of international linkages of trade volumes, prices, interest and exchange rates, as well as assuring world consistency — with the additional benefit of more detailed information on Latin American debtor countries.

The following section provides a brief overview of the history of the debt crisis during the 1980s. It is followed by three sections which look at different aspects of the relation between debt and macroeconomic developments. First, we look at the influence of the world economy and of domestic policies on the evolution of the debt crisis from 1982 to 1986; then we look at some conditions under which new money packages may be beneficial, and discuss how debt-reduction schemes fit into this picture; following this, we consider the impact that

macroeconomic imbalances – another recurring theme of the **1980s** – may have on Latin America performance and the debt situation. The final section draws some conclusions.

## I. THE DEBT CRISIS IN THE **1980s**

The Mexican payments crisis of August **1982** triggered a wave of concern through the international financial community about the size of the accumulated stock of external debt in a number of middle-income developing countries. There arose widespread fears that many depositors would start to withdraw funds from the heavily-exposed banks. In other words, the exposure of commercial banks from the OECD area at the end of **1982** to middle-income debtors was judged by the international financial community as large enough to trigger a serious and widespread international banking crisis. Consequently, it was the immediate threat to the stability of the international financial system that initially occupied the agenda of OECD policy-makers.

It is clear from Table **1** that debtor countries were confronted with major external shocks in the period **1979-82.** Adjustment considerations suggest that the highly indebted countries should have reduced their domestic demand and current-account deficits, and also should have allowed their real exchange rates to depreciate. However, not all debtor governments responded effectively to these global shocks. In a recent NBER study, Dornbusch **(1989)** analysed the responses

Table 1.  World macroeconomic indicators
**1970-82**

| Indicators | 1970-79 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|
| Real commodity prices' | 99 | 97 | 100 | 88 | 76 |
| Oil price | 43 | 64 | 100 | 116 | 111 |
| Libor interest rate[2] | 8.0 | 12.1 | 14.4 | 16.5 | 13.1 |
| Inflation[3] | 8.6 | 9.0 | 11.7 | 9.9 | 7.4 |
| OECD growth[4] | 3.4 | 3.5 | 1.3 | 1.6 | –0.1 |

1. Commodity prices deflated by manufactured export prices of OECD countries.
2. Short-term dollar interest rate (London inter-bank offer rate, per cent).
3. Change in consumer prices of OECD countries (per cent).
4. Change in output of OECD countries (per cent).
*Source:*  OECD Analytical Data Bank.

of Brazil, Mexico, Argentina, Chile and Korea to changes in the international environment in the period 1978-82. He concludes that ''... external factors were by no means the only influence in the debt crisis. On the contrary, domestic policies were an important, often the main, influence in bringing about a large accumulation of debt. External factors reinforced the impact of these debts in 1981-82 via the interest rate shock'' (Dornbusch, 1989, p. 342 and Sachs, 1989). Hence, in the period 1979-82 both external shocks and policy mistakes in debtor countries seriously hampered the economic performance of countries with debt-servicing problems.

Nonetheless, at the time most analysts thought that the major debtors would be back to the capital markets on a voluntary basis by 1986 or 1987. The analytical model for dealing with the external debt crisis in the first phase of debt management, in the years from 1982 to 1985, was based on the notion that a debtor can simultaneously increase its external debt and credit-worthiness. If indicators such as the ratio of debt to GNP or to exports are used to signal changes in credit-worthiness[3], this means that the denominators are expected to grow faster than debt, the numerator. Cline (1983) in particular developed scenarios showing that under apparently reasonable assumptions about the evolution of the world economy, and given sufficient domestic adjustment, most debtors could expect declining debt-export ratios in the years following 1982.

The international management of the debt crisis in its early years was based on such "working assumptions" (IMF, 1982). It provided the analytical underpinning for the view that, for most countries, debt service problems could be regarded as temporary phenomena, or liquidity problems. Such projections implied that debt problems would recede without any profound policy changes in either the OECD area or the debtor countries, provided that OECD growth was not lower than 3 per cent. It was envisaged that there would be sufficient new money in the form of concerted loans by the commercial banks and the international financial institutions to overcome temporary liquidity problems of the debtors. Moreover, it

Table 2.   Debt indicators for the 17 highly indebted countries; 1978-85

Per cent

|  | 1978 | 1982 | 1983 | 1984 | 1985 |
|---|---|---|---|---|---|
| Total debt/exports | 203 | 259 | 295 | 277 | 296 |
| Total debt/GDP | 31 | 45 | 57 | 57 | 59 |
| Interest/exports | 10.2 | 13.8 | 14.5 | **14.7** | 16.7 |

*Source:*   World Bank (1990), World Debt Tables.

was thought that this co-operative strategy would bring the debtor countries fairly quickly back to normal access to private capital markets.

In the event, this debt strategy was only a partial success. An international banking crisis was avoided. But most of the countries involved did not become more credit-worthy. By 1985, indicators for the seventeen heavily indebted countries had not only not improved, but had actually deteriorated relative to 1982, as shown in Table 2.

## A. The Baker initiative

Not only had debt indicators deteriorated further by 1985, but also the process of concerted lending had run into difficulties. Without improvement in debt indicators, and somewhat strengthened by increased reserves on their balance sheets, banks were increasingly reluctant to take part in new money packages; "debt fatigue" had set in.

From the point of view of the debtor countries, the outlook did not appear favourable either. The seventeen highly indebted countries had achieved a large turnaround of their current account, from an aggregate deficit of $52 billion in 1982 to a slight surplus in 1984 and 1985. However, since cuts in domestic demand were largely achieved by reducing investment, the medium-term growth prospects of these economies had been undermined. Table 3 illustrates how, for the examples of Brazil and Mexico, the improvement in the non-interest current account (often referred to as the "resource transfer") had been accompanied by changes in investment. Between 1975-82 and 1983-86, Mexico increased the

Table 3.   Resource transfers and investment

Per cent of GDP

|  | 1975-82 | 1983-86 | Change |
|---|---|---|---|
| Mexico |  |  |  |
| Gross domestic investment | 24.0 | 16.9 | −7.1 |
| Real resource transfer | −0.8 | 7.0 | t7.8 |
| Brazil |  |  |  |
| Gross domestic investment | 23.1 | 16.2 | −6.9 |
| Real resource transfer | −3.7 | 3.6 | t7.3 |

Note:   The investment ratio has been calculated using 1980 dollar volumes. **The** real resource transfer is calculated as the non−interest current account **surplus** in constant 1980 dollars. Arithmetic averages have been used.
Source:   World Bank (1990), World Tables.

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resource transfer to the rest of the world by 7.8 percentage points of GDP; between these periods, the investment ratio declined by an almost equivalent amount, 7.1 per cent of GDP. In Brazil, an increase in the resource transfer of 7.3 percentage points of GDP was achieved by cutting the investment ratio by 6.9 percentage points of GDP[4].

Despite this dramatic adjustment, debtor countries were beginning to conclude in 1985 that a return to voluntary lending was not to be expected over the medium term. Thus the rationale for continued payment of debt service payments on commercial terms — from the point of view of debtor countries — seemed less strong than in 1982/83, when the diagnosis of the debt crisis as a short-term liquidity problem provided the possible incentive of a resumption of voluntary lending within the not too distant future.

The Baker initiative tried to strengthen the prevailing debt strategy, treating the process of bringing the debtor countries back to credit-worthiness as a longer term problem. The plan was based on a co-ordinated approach between commercial banks, international financial institutions, and governments to provide new money to debtors on a case-by-case basis; the stated goal was to reduce the net outflow from the debtor countries. Recognising the negative implications for growth of much of the short-term adjustments that debtor countries had undertaken, the Baker initiative also explicitly sought to reconcile growth and adjustment. It therefore asked for far-reaching structural reforms in three areas: trade liberalisations, liberalisation of policies for direct foreign investment, and reform of the state enterprise sector. Finance and reform were to be mutually reinforcing. New money would help carry out these reforms by avoiding sharp investment cuts of the 1982/83 type and serious structural reforms would justify providing new money to these countries.

This approach was successful in the sense that several debtor countries began to restructure their economies. It also succeeded in strengthening the international financial system. The banks raised new capital, and dramatically increased their provisioning in 1987 and the following years. Consequently, the exposure of U.S. banks to the debtor countries decreased (see Table 4). By March 1989, the Chairman of the Federal Deposit Insurance Corporation was able to state in his testimony to the U.S. House of Representatives Committee on Banking, Finance and Urban Affairs that even if all the debt of Latin American countries were written off, no U.S. money centre bank would be insolvent[5] (IMF, 1989, p. 19).

The Baker initiative was less successful as far as credit-worthiness indicators are concerned. These indicators worsened at first, in 1986 and 1987, before starting to improve in 1988 (Table 5) and only by end of 1989 were 1985 levels of credit-worthiness reached again. The Baker initiative was also less successful in reducing the resource outflow from the highly indebted countries, as new lending

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Table 4. **The exposure of U.S. banks**
1982-88

|  | 1982 | 1986 | 1988 |
|---|---|---|---|
| Nine major U.S. banks' | | | |
| All LDCs | **287.7** | **153.9** | **108.0** |
| Latin America | **176.5** | **110.2** | **83.6** |
| **All** other U.S. banks' | | | |
| All LDCs | **116.0** | **55.0** | **32.2** |
| Latin America | **78.6** | **39.7** | **21.8** |

1. Loans to **LDCs** and Latin America as a percentage of bank capital, end of year data.
*Source:* Federal Financial Institutions Examination Council **(1987, 1989).**

by commercial banks and official lenders was much less than envisaged. **Also,** despite initial good intentions, implementation of programmes of structural reform in the debtor countries themselves was uneven, with only Chile, and later Mexico, making determined efforts to restructure the economy; output growth after **1986** was poor. Thus, improved debt indicators seemed less a sign of successful adjustment and growing out of debt, than an indication of a low growth, high resource transfer, path. The debtor countries seemed to be stagnating out of the debt crisis.

Table 5. **Debt indicators for the 17 highly indebted countries (1985-89)**
Per cent

|  | 1985 | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|---|
| Total debt/exports | **296** | **353** | **358** | **321** | **300** |
| Total debt/GDP | **59** | **62** | **63** | **61** | **59** |
| Interest/exports | **16.7** | **18.1** | **15.5** | **20.8** | **19.4** |

*Source:* World Bank (1990).

## B. Debt reduction and beyond

With the danger for the world financial system under control, the debt strategy became more directly concerned with the consequences of the debt crisis for medium-term growth of the debtor countries themselves. **By 1988,** most

observers concluded that the new money with structural reform strategy was not working as hoped for the economic situation of the debtor countries, and in March **1989** OECD policy-makers explicitly recognised that the debt strategy needed to be re-invigorated. It was judged that many debtor countries were unlikely to grow out of their debt. Even if they were willing to undertake significant structural reforms, they might choose not to do so if most of the benefits were likely to accrue to foreign creditors. The "debt overhang hypothesis" provided the intellectual background against which a strategy of debt and debt service reduction appeared a more promising approach than new money to get debtor countries out of their low growth equilibrium.

Much of the intellectual argument for debt reduction hinges on incentive and confidence effects that are not easily modelled or quantified. In developing the models used in the preparation of the present study, for example, it was not possible to find a convincing role for debt-overhang effects (compare Claessens et *al.,* **1990).** Reaching agreement on the debt-reduction packages has proved to be no less difficult than for earlier rescheduling agreements; the amount of debt effectively or actually written off has generally been substantially lower than debtor countries might have originally hoped. Nevertheless, a number of debt-reduction agreements are now in place, though by their nature it is too early to say whether they are proving successful.


## II.   COPING WITH THE CRISIS: EXPECTATIONS AND REALITY, **1983-86**


At the start of the debt crisis, most analysts expected debtor countries to grow out of their debt, helped by resuming OECD growth and declining interest rates. This expectation was not realised. On the contrary, the debt situation worsened. This section quantifies the contribution of the world macroeconomic environment to this failure, using simulations with the DEMOD models in conjunction with INTERLINK. It also provides some indirect indication of the role of domestic policies in this context. The methodology is quite simple: we ask first what would have happened had the expectations widely held in **1982-83** materialised, and then proceed to replace the expected value for each value by its actual value, one by one. The result is a decomposition of the difference between the expected path for the debt to export ratio and its actual path.

This type of analysis has limitations that need to be borne in mind. First, and most important, the decomposition of the change in the net debt to export ratio is done against a baseline that represents the beliefs of analysts in **1982.** Thus, the figures that we have calculated can be used to say something about the expectations in **1982** only, and are not statements about the influences of external or

domestic variables per se. Second, the period under review is **1983** to **1985-86.** Since then, Mexico has embarked on significant structural changes, leading to a reversal of flight capital in **1989,** whereas the macroeconomic situation in Brazil has worsened, and capital exports have increased (OECD, **1990,** pp. **39-41).** However, during the period under review, these more recent trends had not yet appeared. Third, we do not consider all factors that could possibly explain the difference between projected and actual path of the debt to export ratio, but focus on those that can be analysed with DEMOD. The following variables are considered: domestic growth; OECD growth; the LIBOR interest rate; capital exports; the prices of raw materials, manufactures and energy; debt revaluation due to changes in the effective dollar exchange rate; net direct foreign investment; oil trade volume. Most of these variables are part of the international economic environment. Some, however, are more closely linked to domestic policies in the debtor countries: we use capital exports and net direct foreign investment flows as indirect indicators of the quality of the domestic economic policy framework.

The confidence that can be placed in this analysis depends on how well DEMOD explains the development of the debt to export ratio. The result of a dynamic simulation from **1979** to **1987** is shown together with the actual value of the debt to export ratio for Latin America in Chart **1.** The model tracks the debt

CHART 1

**DEBT TO EXPORT RATIO FOR LATIN AMERICA**
**Actual and the result of a dynamic simulation, 1979-87**
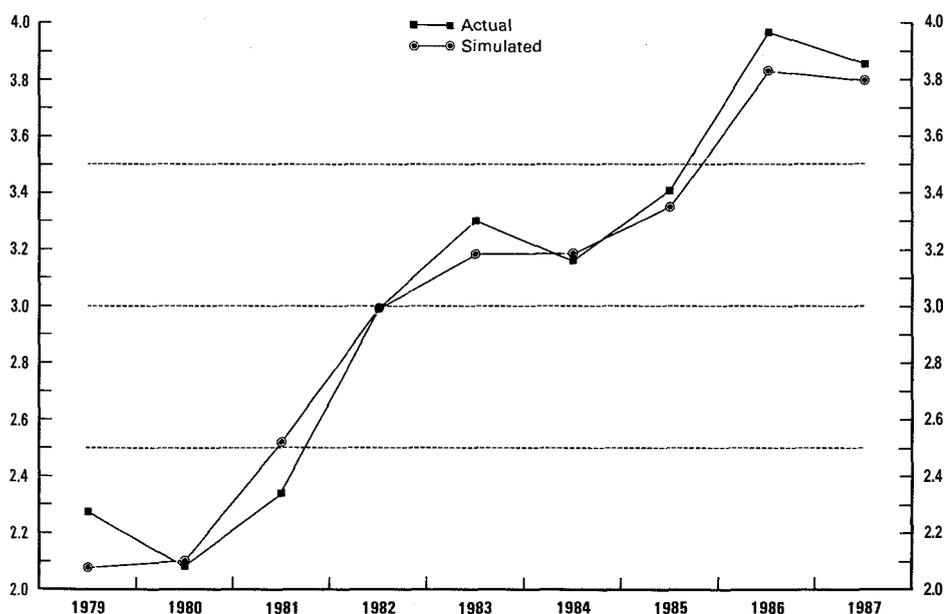
to export ratio well, with a root mean square simulation error of 4.3 per cent for Latin America as a whole, and 9.5 for Brazil and 3.5 for Mexico.

## A.   A counterfactual scenario for 1983-86

A representative example of the expectations held by most analysts in 1982 of how the world macroeconomy could evolve is in Cline (1983), from which we reproduce assumptions for the world economy in Table 6. OECD growth was projected at a steady 3 per cent annually and short-term dollar interest rates were expected to decline to 8 per cent; the dollar depreciates slightly. Oil prices were assumed to decline first, and then to increase in 1986. The path for raw material prices was taken to equal world export inflation plus dollar depreciation. Based on these assumptions for the world economy, and auxiliary assumptions for the debtor countries (to be discussed below), Cline's simulations for major debtor countries showed declining debt to export ratios. Even under various alternative scenarios, a decline in the debt to export ratios could be expected, provided OECD growth was 3 per cent or more. This is what was called the "Narrow Path" out of the debt crisis.

Table 6 also compares the assumptions used for Cline's base case with actual values. OECD growth turned out even higher than expected, and the interest rate decline was projected fairly accurately. Looking at these two vari- ables alone, the conditions to achieve the "Narrow Path" were met. Also, the oil price projections are close to actual values until 1986, when the oil price halved to only $15 per barrel. Wide of the mark were the projections for the dollar exchange rate and, related to this, for export prices other than oil (actual raw material prices are shown for comparison). The dollar continued to appreciate until 1985, and nominal non-oil export prices declined by 11 per cent between 1982 and 1986, instead of rising by 39 per cent as assumed in the base case scenario. In addition to this general world inflation effect, the terms-of-trade of Latin America declined somewhat.

Assumptions for domestic variables are also taken from Cline (1983). Four assumptions for the domestic economy are used: i) domestic real GNP growth rates; ii) capital exports; iii) net direct foreign investment; and iv) volumes of energy trade. After a decline of real GNP of 2 per cent in 1983, Cline assumes growth of 6 per cent per annum for Brazil, and 4.5 per cent for Mexico. The Cline projections implicitly assume no capital exports; estimations made during the development of DEMOD point to cumulative capital exports between 1983-86 of the order of $20 billion for Mexico, and $10 billion for Brazil. While these figures should be treated with caution, given the difficulty of defining and measuring capital exports, they certainly suggest that capital exports should be taken into account in debt projections. Net direct foreign investment inflows were assumed

Table **6.** **The world macroeconomic environment, 1983-86**

Cline assumptions and actual outturn

| | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|
| **OECD growth, per cent** | | | | |
| Assumed | **1.5** | **3.0** | **3.0** | **3.0** |
| Actual | **2.7** | **4.8** | **3.4** | **2.6** |
| **Oil price ($/barrel)** | | | | |
| Assumed | **34.0** | **29.0** | **29.0** | **34.0** |
| Actual (OECD import price) | **30.0** | **29.0** | **27.5** | **15.0** |
| **Interest rate (LIBOR)** | | | | |
| Assumed | **10.0** | **9.0** | **8.0** | **8.0** |
| Actual | **9.6** | **10.8** | **8.3** | **6.9** |
| **$ exchange rate (1982=100)** | | | | |
| Assumed | 95 | a7 | 87 | 87 |
| Actual | 105 | 110 | 113 | 96 |
| **Raw material prices (1982= 100)** | | | | |
| Assumed | 110 | 127 | 133 | 139 |
| Actual | 101 | 99 | 92 | 89 |

*Source:* Cline (1983) and OECD Analytical Data Bank.

by Cline in **1982** to grow by **3** per cent in real terms annually; they actually declined strongly. Energy exports and imports are assumed constant at their **1982** level; actual values differ from this assumption, especially for Brazil where import substitution policies reduced oil imports.

With these assumptions and those for the world economy fed into DEMOD, the models for Brazil and Mexico were solved dynamically over the four year period from **1983** to **1986** to produce alternative paths for the endogenous variables. The indicator for credit-worthiness used for this exercise is the net debt to export ratio[6], which is used to facilitate comparison with Cline's simulations; the results of the analysis are similar if indicators based on gross debt are used.

Chart **2** shows the actual values for the net debt to export ratio and the DEMOD simulations, for Brazil and Mexico. The Cline projections are also reproduced for comparison. Based on these simulations, together with some additional sensitivity analysis, it would seem that a "Narrow Path" out of the crisis may not only have appeared feasible, but even likely. It should be noted that the DEMOD simulation benefits from hindsight; the parameters in DEMOD incorporate information on the actual relationship between variables during this period; in addition,

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CHART 2

## NET DEBT TO EXPORT RATIO, 1982-86
## ACTUAL AND SIMULATED
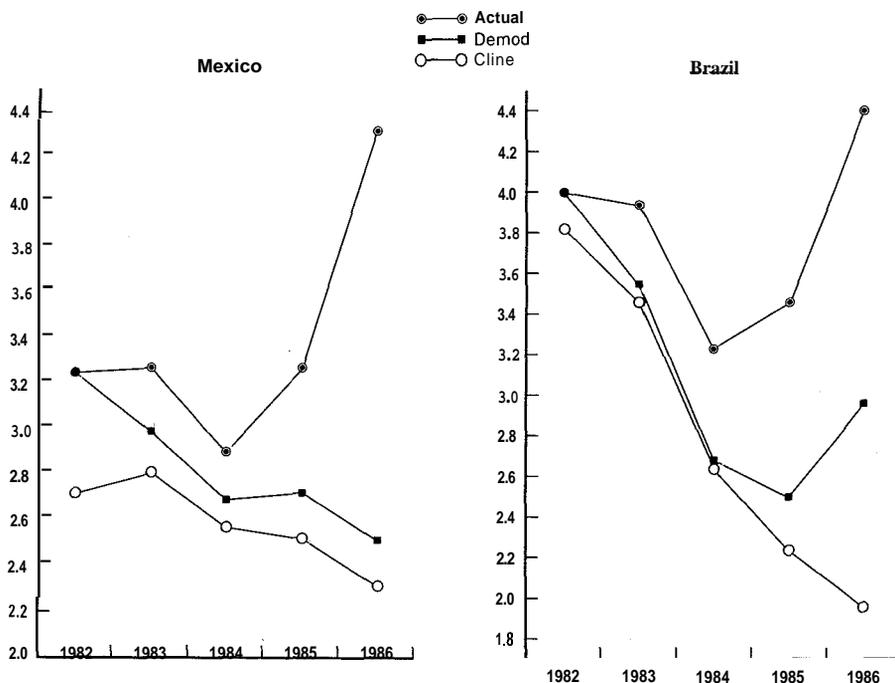


1 e data for 1982 are now known. By contrast, projecl ɪns made in 1982-83 were based on estimated data for 1982, and on projections of likely parameter values for 1983-86.

## B.   Where did expectations go wrong?

The following section quantifies the contribution of the difference between assumptions and actual value of variables on the evolution of the net debt to export ratio. These calculations need to be interpreted very carefully. The contributions shown in Tables 7 and 8 have been calculated using the simulated "Narrow Path" as starting point. Starting from there, the assumptions for different variables have been replaced by actual values one at a time. This has the advantage that the figures in the table are directly comparable. All contributions taken together, however, do not add up to the total difference between the

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Table 7. **Net debt to export ratio for Brazil, 1983-86**

"Narrow path" projection and actual path

| | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|
| "Narrow path" projection | 3.55 | 2.68 | 2.50 | 2.96 |
| Contribution of major factors: | | | | |
| Capital exports | 0.03 | 0.13 | 0.27 | 0.42 |
| Raw material prices | 0.14 | 0.39 | 0.68 | 1.00 |
| Manufactures prices | 0.27 | 0.43 | 0.43 | 0.38 |
| Oil volume | −0.01 | -0.14 | -0.22 | -0.37 |
| Contribution of other factors: | | | | |
| Domestic growth | -0.04 | -0.07 | −0.10 | −0.10 |
| Oil price | 0.03 | 0.04 | 0.04 | -0.04 |
| Debt revaluation | −0.10 | -0.20 | -0.23 | -0.17 |
| OECD growth | -0.02 | -0.25 | -0.28 | -0.32 |
| Net direct foreign investment | 0.05 | 0.09 | 0.15 | 0.28 |
| U.S. interest rate | −0.01 | 0.04 | 0.05 | 0.03 |
| Actual path | 3.94 | 3.23 | 3.46 | 4.40 |

Source: OECD.

Table 8. **Net debt to export ratio to Mexico, 1983-86**

"Narrow path" projection and actual path

| | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|
| "Narrow path" projection | 3.02 | 2.70 | 2.73 | 2.52 |
| Contribution of major factors: | | | | |
| Capital exports | 0.45 | 0.59 | 0.87 | 0.80 |
| Domestic growth | -0.20 | -0.37 | -0.55 | -0.98 |
| Oil price | 0.03 | 0.05 | 0.12 | 1.40 |
| Contribution of other factors: | | | | |
| Raw material prices | 0.03 | 0.08 | 0.10 | 0.10 |
| Manufactures prices | 0.04 | −0.00 | -0.12 | -0.23 |
| Debt revaluation | −0.10 | -0.23 | -0.27 | -0.14 |
| OECD growth | −0.01 | -0.14 | -0.18 | -0.18 |
| Net direct foreign investment | 0.05 | 0.10 | 0.15 | 0.17 |
| U.S. interest rate | -0.02 | -0.05 | -0.06 | 0.03 |
| Oil volume | −0.10 | -0.18 | -0.08 | 0.31 |
| Actual path | 3.28 | 2.91 | 3.28 | 4.32 |

Source: OECD.

"Narrow Path" and the actual value of the net debt to export ratio, because of non-linearities.

The mechanical nature of the decomposition of changes in the net debt to export ratio that is presented in these tables must be stressed. What are presented as separate effects may make economic sense only if they are considered together. For example, raw material prices depend partially on OECD activity and the dollar exchange rate; if a lower dollar exchange rate is used in INTERLINK model simulations, raw material prices would rise. The tables present such related effects separately in order to show the size of individual effects, but in interpreting the figures the partial nature of this decomposition should not be forgotten.

Table 7 decomposes the difference in the net debt to export ratio for Brazil between the DEMOD "Narrow Path" projection and the actual path. The factors which contributed most to this difference by **1985** are highlighted in the table, and, for convenience, illustrated in Chart **3.** It is also useful to group these factors into variables representing external shocks and variables determined more by domestic policies. This allows a comparison of the importance of the world macroeconomy with the influence of variables that are more easily influenced by domestic policy measures. Variables that reflect the quality of the domestic policy framework are capital exports and net direct foreign investment flows; it is these variables that basically reflect a kind of "voting with your purse". Domestic growth performance is also shown.

The strongest impact of the world macro-economy on the difference between projected and actual net debt to exports ratio comes from overestimated trade price inflation. This overestimation of raw material and manufactures prices alone accounts for a **111** percentage point difference between the actual and the simulated net debt to export ratio in **1985.** Lower than expected world inflation influences the debt to export ratio through two channels. First, lower export prices immediately reduce the value of exports and thus increase the ratio. Second, lower prices reduce the trade surplus and increase the current account deficit, thereby increasing the stock of outstanding debt and worsening further the debt to export ratio. These effects should not be misunderstood as terms-of-trade effects; in fact, the terms-of-trade for Brazil hardly changed between **1982** and **1985,** before improving dramatically in **1986** due to the falling oil price.

While external developments during **1983-86** have contributed significantly to the worsening debt situation in Brazil, domestic policies have also been important. If one views capital exports and net direct foreign investment as primarily influenced by domestic economic policies, then domestic policies appear to have been the second most important factor in explaining the actual path of the debt to export ratio, after raw materials and manufactures prices. Taken together, underestimation of capital exports and overestimation of net direct foreign investment account for a **42** percentage point difference between the actual and the simu-

lated "Narrow Path" trajectory of the net debt to export ratio. The import-substitution policy for oil is apparent in the negative contribution of oil volumes: oil imports in volume terms declined strongly during the period under review, which improved the net debt to export ratio due to a lower current account deficit and hence lower debt. Remaining factors have been of less importance. Higher than expected **OECD** growth made a positive contribution towards lowering the debt to export ratio, as did an appreciating dollar (by reducing the dollar value of the non-dollar part of the debt stock).

The analysis for Mexico is reported in Table **8** and an overview of main factors is shown in Chart 4. The picture for Mexico is remarkably different from that for Brazil. While in the case of Brazil the world macro-economy was found to be of major importance, for Mexico domestic factors emerge as the main reason for a higher than expected debt to export ratio − in the years up to and including **1985.** In **1986,** oil prices halved, which had a dramatic impact on Mexico, adding 140 percentage points to the net debt to export ratio.

CHART 3

**DECOMPOSITION OF THE CHANGE IN THE DEBT TO EXPORT RATIO FOR BRAZIL**
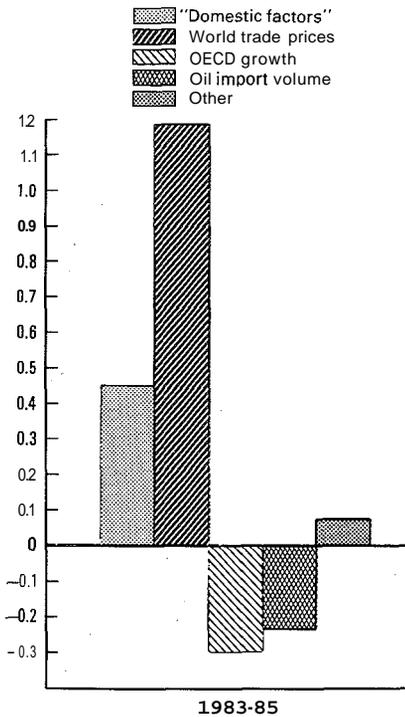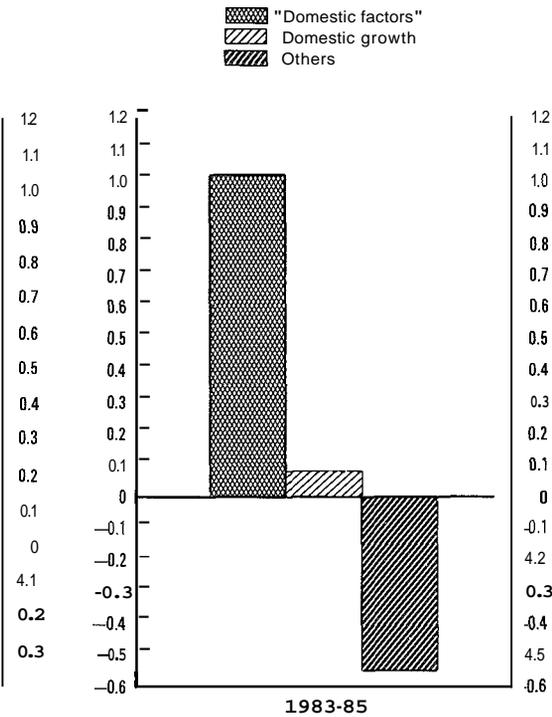
- "Domestic factors"
- World trade prices
- OECD growth
- Oil import volume
- Other

CHART **4**

**DECOMPOSITION OF THE CHANGE IN THE DEBT TO EXPORT RATIO FOR MEXICO**

- "Domestic factors"
- Domestic growth
- Others



1983-85



1983-85

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In focusing on domestic developments in Mexico, there are two points worth noting. First, growth was much lower than expected, leading to lower imports and hence contributing to an improvement in debt indicators. This effect was the stronger as imports in Mexico are closely correlated with investment: not only was growth lower than expected, but also the investment ratio decreased dramatically. During 1975-82 the ratio of investment to GDP was 24 per cent; based on longer time series, one would perhaps have expected to see an investment ratio of about 20 per cent during the eighties (this is the assumption used in the "Narrow Path" projection). The actual investment ratio for 1983-86 was only 17 per cent, reducing imports and debt stocks even more. Lower than expected domestic growth thus contributes towards improving the net debt to export ratio, by 55 percentage points in 1985, and by 98 percentage points in 1986 (due to the domestic recession associated with the oil price shock).

As a barometer for the domestic economic policies during this period of slower than expected growth and dramatic reductions in the investment ratio, we take again capital exports and net direct foreign investment. Judged by these indirect indicators, domestic policies appear to have contributed significantly to a worse than projected debt to export ratio. Higher than projected capital exports and lower than projected net direct foreign investment accounted in 1985 for 102 percentage points of the difference, and for 97 percentage points in 1986. The table suggests that Mexico could have done much better than it actually did. With better domestic policies, capital exports should have been lower and foreign investment higher. This would have allowed higher investment ratios, higher growth, and higher imports, without a worse debt to export ratio than was actually experienced.

What does this analysis tell us about the importance of the macroeconomic environment for the development of the debt situation between 1982-86? There are three main lessons. First, no single variable explains events in both countries. In Brazil, the unexpected development of the world macro-economy appears to have been the most important factor for worse than projected debt indicators; domestic policies different from those expected seem to have played only a secondary role. By contrast, in Mexico, domestic factors are most important in explaining worse than expected credit-worthiness, with capital exports being especially important, up to and including 1985. With the oil price collapse in 1986 external factors naturally become dominant.

Second, these large differences between the two most important countries in Latin America make it difficult to draw general conclusions for other countries. It is clear, however, that Brazil's export structure is more comparable to most Latin American countries than that of Mexico, especially before 1986, with raw materials and manufactures being the main export categories. The high value of the dollar and related lower than expected world trade prices were major, and

possibly the most important, factors explaining the unexpectedly small progress in credit-worthiness of Latin America during the first four years after 1982.

Third, there is indirect evidence – although DEMOD is not geared to analyse the impact of domestic policies directly – that domestic policies were a major factor responsible for the difference of actual from projected debt indicators. Capital exports have been sizeable, especially in Mexico, while the projections in 1982-83 assumed no capital exports. In addition, net direct foreign investment has been much lower than expected, contributing also to a higher than expected debt to export ratio. Higher than expected capital exports, and lower than expected foreign investment, indicate that macroeconomic and structural policies have failed to convince domestic and foreign investors to invest in the country as much as had been expected in 1982-83.


### III.   NEW MONEY AND STRUCTURAL ADJUSTMENT

During the years of the Baker initiative the key policy question was by how much debtor countries would have to adjust in order to combine new money flows with improving indicators of credit-worthiness. The question was not necessarily asked in this form at the time, and many analysts continued to rely on Cline type scenarios to show that new money could be compatible with improving credit-worthiness. But an implicit judgement that the necessary increase in exports would be forthcoming as financial flows to the debtor countries were increased was at the heart of the Baker initiative. The Brady plan's provision for debt reduction recognised that expectations of new lending had perhaps been unrealistic, and also that debt reduction gives a simple accounting improvement in conventional credit-worthiness indicators more easily. Emphasis on structural adjustment remains paramount, however.

This section analyses the impact of new lending on Latin American performance and credit-worthiness, and considers structural adjustment from the point of view of the necessary improvement in export performance to prevent credit-worthiness indicators from deteriorating. Increased net flows are also compared with debt reduction.


## A.   The baseline for the simulations

The simulations in this and the following section start from baselines for the OECD and Latin America for 1990 to 1994. Growth in the OECD area is assumed to be smooth, and projected at 2.9 per cent, the same as during the 1980s. Capacity utilisation in the area remains high, inflation peaks in 1990 at 4.6 per cent and declines thereafter to 3.6 per cent in 1994. This development is

mirrored by short-term interest rates, which decline from 9.2 per cent in 1990 to 7.6 per cent in 1994. The trilateral current account imbalances between the United States, Japan, and Germany remain roughly constant as a percentage of GDP. Thus there is little adjustment, but there is no crisis either. The assumption is that these imbalances can be smoothly financed, without major changes in exchange rates or interest rates.

The baseline for Latin America takes a cautiously optimistic view of the world. To the generally favourable external environment, slowly increasing net flows and low capital exports are added. This assumes that Latin American countries make some progress with macroeconomic stabilisation as well as structural reforms. Their aggregate current account deficit remains at about $10 billion. Taken together with satisfactory export growth, this would appear to allow growth to resume. Most variables have been projected using the DEMOD model itself. Output growth has been checked for consistency with project LINK and World Bank projections, and achieved mainly through add factors in the investment equations. Output growth in Latin America is projected at an average of 4.1 per cent, ranging from 1.1 for Argentina to 5.2 per cent for Chile. Overall imports grow at 9.6 per cent, which implies an import elasticity of 2.3. Relatively rapid export and GDP growth allow debt indicators to improve over time. For example, the debt to export ratio is projected to decline by one quarter; total debt increases to almost $500 billion by 1994.

It should be pointed out that this scenario could be considered optimistic on three counts. First, there are clearly risks in the baseline for the OECD area with respect to both output and interest rates which would cloud considerably the outlook for Latin America. Second, macroeconomic policies in Latin America may not improve very much, and fragile reform efforts under way could be derailed. In such a case, much higher capital exports, and lower investment and growth could be expected. Third, the baseline does not incorporate the most recent developments in central and eastern Europe and the impact of higher oil prices.

While these factors could by themselves lead to a significantly worse baseline, they are less critical for an evaluation of how specific factors may alter the outcome. We concentrate here on simulated deviations from baseline. Such simulations require assumptions about how policies respond to changed conditions. OECD countries are assumed to hold government expenditures constant in real terms; monetary policy is non-accommodating, such that broad money aggregates are unchanged from baseline values.

## B.   Increase in net flows

The results of a combined simulation of DEMOD and INTERLINK that incorporates increased net flows are shown in Table 9. Net flows to Latin America have

been increased by the equivalent of the savings in interest payments that would result from a debt reduction of 15 per cent. This figure is within the range of agreements under the Brady initiative. Increased inflows lead to higher investment and imports; the aggregate current account deficit deteriorates against baseline, and in combination with the debt dynamics leads to increasingly worse debt indicators. The deterioration is somewhat reduced by increased exports to the OECD area because of increased OECD import demand resulting from higher OECD GDP, caused, in turn, by increased exports to Latin America. Without this feedback, Latin America's current account deficit in 1994 would be 13 per cent higher than shown in Table 9. The impact of higher inflows on GDP and investment is significant, but not dramatic. After five years, the investment ratio has risen by 0.4 percentage points, and GDP has increased by 0.8 per cent over the baseline level, equivalent to a temporary rise in the rate of GDP growth for these years of less than 0.2 per cent.

This simulation may underestimate the positive impact of increased net flows. Some Latin American economies, like Chile and Mexico, are already undergoing rapid structural change, including large scale privatisation and better incentives to perform given by more realistic exchange rates and other prices. Even more countries have achieved the basic conditions for macroeconomic stability. These recent changes are not embedded in the equations of the model that has been used for the simulation. To the degree that structural reforms are improving, or, in some cases, have already improved the supply response, increased net flows may lead to a bigger improvement in investment, growth and exports than shown in this simulation, and the deterioration of credit-worthiness indicatois would be smaller.

Table 9.  Impact on Latin America of an increase of net flows equivalent
to a debt service reduction of 15 per cent

Change from baseline in percentage points

|  | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|
| GDP | 0.3 | 0.7 | 0.8 | 0.8 | 0.8 |
| Investment/GDP | 0.3 | 0.5 | 0.4 | 0.4 | 0.4 |
| Current account ($ million) | −1 821 | −3 915 | -4 351 | -4 831 | −5 319 |
| Debt/exports | 0.9 | 2.4 | 3.8 | 5.6 | 1.2 |
| Interest/exports | 0.0 | 0.1 | 0.2 | 0.4 | 0.5 |
| Debt/GDP | 0.1 | 0.3 | 0.6 | 0.9 | 1.2 |

*Source:* **OECD.**

The impact on the OECD of increased lending to Latin America is small. Increased investment, growth, and income in Latin America, lead to an increase in OECD exports by 0.2 percentage points. This increase in demand causes GDP to rise temporarily, but by an insignificant amount. Even this small rise is not sustained, however. With OECD economies running near full capacity, and with non-accommodating monetary policy, additional export demand triggers a rise in interest rates which then reduce investment and output over the medium term. Inflation increases by 0.1 percentage points. The temporary GDP rise increases imports for a time, giving Latin America an additional positive feedback.

While model simulations with DEMOD cannot directly show the influence of structural reforms, it is nevertheless possible to gain some understanding of the magnitudes involved. The approach is to start with the new money scenario, and then to ask by how much the performance of the economy needs to improve so that debt indicators do not worsen. From a microeconomic perspective, the investments financed by new money must have a rate of return that at least equals the interest rate on debt. From a macroeconomic point of view, domestic policies have to provide the right incentives for resources to be shifted to the tradeable sector in order to increase the net exports that are required to service the additional debt. In this context, a sensible condition of sustainable external borrowing is that the credit-worthiness indicators improve, or at least do not deteriorate. Indirect evidence for the necessary impact of structural reforms can therefore be gathered by calculating the increase in export growth necessary to prevent debt indicators from worsening.

Table 10 shows the results of the new money simulation where export growth has been increased such that the debt to GDP ratio stabilises; other

Table **10.** **Increased net flows and structural adjustment, exports being increased to keep the debt to GDP ratio unchanged**

Change from baseline in percentage points

| | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|
| GDP | 0.6 | 1.4 | 1.8 | 2.2 | 2.6 |
| Investment/GDP | 0.3 | 0.6 | 0.6 | 0.6 | 0.6 |
| Current account ($ million) | −1 271 | −2 822 | −2 410 | −1 873 | −1 014 |
| Debt/exports | −1.3 | −2.2 | −3.3 | -4.0 | −5.2 |
| Interest/exports | -0.1 | -0.2 | -0.3 | -0.3 | -0.3 |
| Debt/GDP | -0.1 | 0.0 | 0.0 | 0.0 | 0.0 |

*Source:* OECD.

indicators improve. The current account deficit is much lower than in the scenario presented in Table 9, which involves the same amount of new money but without an export response. Higher exports lead to higher GDP growth, and also the investment ratio increases compared to the new money only scenario. The additional increase in the growth rate of exports necessary to prevent the debt to GDP ratio from deteriorating is 0.9 percentage points. Given that exports in the baseline grow at an annual rate of 6.3 per cent, structural reforms would have to increase this rate to 7.2 per cent per annum over the simulation period[7].

Such an improvement in export performance seems feasible, provided strong programmes of structural reform are implemented. Nevertheless, such a new money strategy, as pursued under the Baker initiative between 1986 and 1988, would appear risky. Slippage in the implementation of reform programmes, or unexpected declines of the terms-of-trade or of trade prices in general, could quickly push this strategy from a just sustainable to an unsustainable path.

## C.   Debt and debt service reduction

From this analysis, one might conclude that debt reduction may be a safer way to improve Latin American growth prospects. A debt reduction of 15 per cent would have an immediate impact on credit-worthiness indicators. The debt to exports ratio would fall by 44 percentage points, and the debt to GDP ratio by 7 percentage points. On the other hand, while credit-worthiness indicators would improve, the impact of debt reduction on investment and growth is much less clear. The impact depends on whether debt is being serviced at present, and, if not, whether debt service is expected to resume in the future. The new money simulation is best understood as assuming full debt service; a direct comparison between new money and debt reduction should perhaps adopt this assumption, but we need to focus on the situation of countries in arrears as this is the background against which debt restructurings are taking place at present. The key difference is likely to be found in behaviour which is not well specified in DEMOD, nor indeed in any other empirical macroeconomic model.

There are two effects to consider. Debt reduction per se may not increase the resources available to debtor countries at all. This would be the case if debt has not been serviced for some time and is trading at a discount in secondary markets. A write-down of nominal debt in these circumstances may not influence the real value of debt at all, but lead only to a corresponding increase in secondary market prices, but still leave them at a discount to the nominal value. The country would not get any debt service savings from such a transaction, because the debt that was reduced on paper had not, in fact, been serviced before. Debt reduction would improve indicators of credit-worthiness, but would not loosen the finance constraint. If the finance constraint were binding, investment and growth would

therefore not be affected by debt reduction. This effect may also be present if new money is provided in the same circumstances.

But, even if debt reduction did nothing to ease the immediate finance constraint, it could still have an impact on performance by changing incentives, if residents and investors anticipate a resumption of debt service in the future. This is the so-called debt overhang argument. Its essence is that a high level of external debt may prove a disincentive to investment since it can be shown, under certain assumptions, to be equivalent to a high marginal tax rate on domestic investment (Krugman, **1988).** If these effects are important, then reducing external nominal debt could have a strong influence on domestic investment and growth through the change of incentives, with unchanged external finance.

The impact of debt reduction on performance thus hinges on the relative importance of these two effects. **If** the immediate external finance constraint is binding, then debt reduction will have no influence on domestic performance; if disincentive effects are at centre stage, debt reduction will have an influence on domestic performance. Empirical evidence indicates that on the external side, the finance constraint is, for most Latin American countries, the more important element influencing performance (compare Claessens *et al.,* **1990).** In this case, it would be desirable to combine elements of debt and debt service reduction with increased net flows. This combination could contribute towards improving domestic performance without worsening indicators of credit-worthiness, especially if combined with a strong programme of structural reform[8].


## IV.   MACROECONOMIC IMBALANCES AND THE DEBT SITUATION


Macroeconomic imbalances have been important for the evolution of the debt situation from the beginning. The evolution of private and public savings rates in the United States in the early eighties and, more recently, changes in the demand for savings arising from reforms in central and eastern Europe, have affected world savings-investment balances. In this section, the issue of macroeconomic imbalances, and, in particular, changes in public and private savings, is explored in more detail, and the magnitudes involved are quantified, with the help of two, largely symmetrical, scenarios. The first one is of a counterfactual nature, and considers the impact on Latin America if savings in the United States in **1981-86** had not declined as they actually did, together with appropriate assumptions for plausible paths of interest and exchange rates in the OECD area. The second considers the impact on Latin America if U.S. fiscal adjustment targets for the first half of the **1990s** are not met.

## A. A counterfactual scenario, 1981-86

The period 1981-86, independently of developments in the debt crisis, was a period in which patterns of international financial flows changed radically within the OECD area. In particular, in the United States this period saw a decline in the private sector savings rate and a substantial increase in the public sector budget deficit which, taken together, supported relatively rapid real growth and resulted in a substantial increase in total borrowing by the United States; the need to avoid monetisation of the fiscal deficit also kept interest rates relatively high. The resulting capital inflows were reflected in a rapidly increasing current account deficit, and, for the first few years, a large appreciation of the dollar.

The assumptions for the counterfactual simulation are taken from Shafer (1988), which investigated the consequences for OECD countries of the major macroeconomic developments in the United States during the first half of the 1980s. The method used in that study was to construct a counterfactual scenario for the period 1981-86 in which certain aspects of the behaviour of the U.S. economy were assumed to have been different. Specifically, the personal sector savings ratio was assumed not to have fallen (from around 7 per cent in 1981 to just above 3 per cent in 1986) but to have remained roughly constant; fiscal policy was assumed to have prevented the large rise in the public sector deficit and the U.S. dollar was assumed to appreciate steadily but slowly throughout rather than to have risen sharply from 1981 to 1985 and subsequently fall.

The alternative scenario includes lower interest rates resulting from higher savings in the United States and from non-accommodating monetary policy in other OECD countries faced with relatively lower U.S. demand. In the United States, interest rates are raised initially to higher levels than were actually reached in 1981 and 1982: a sharp deflationary monetary shock (to offset the effect of the much lower dollar, which would otherwise imply rather higher inflation) whose impact on inflation expectations is assumed to have been sufficient for U.S. interest rates to fall after 1982. These assumptions have been adopted to develop the scenario presented here.

Table 11 shows in summary form how this scenario differs from what actually occurred, the "baseline", for the OECD countries in the period 1981-86. GDP is considerably lower in the United States, and inflation somewhat higher (although it is on a declining path throughout the period); on the other hand, public finances are in considerably better shape, as is the current balance. Outside the United States, lower interest rates and exchange rates would have generated considerably higher GDP, without creating more serious inflation problems. The counterpart of the improvement in the U.S. current account would be found mostly in Europe, and partly in Japan.

This scenario presents quite a complicated combination of events external to Latin America – large changes in exchange rates, interest rates initially rather

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Table 11. The counterfactual scenario: selected OECD variables
1981-86

| | Interest rate[1] | Budget balance[2] | GDP volume[1,3] | | GDP deflator[3] | Current balance[4] | Effective exchange rate[4] | LAT rate deflator[3] |
|---|---|---|---|---|---|---|---|---|
| OECD | −1.3 | | t o.l | −0.1 | −0.0 | t 2 8 | | t 2.6 |
| **USA** | −0.4 | t 1.5 | −1.8 | −0.7 | t 0.8 | **t** 142 | −18 | |
| Europe | −2.2 | +1.0* | +1.0 | t 0.2 | −0.7 | −100 | +12** | |
| Japan | −2.5 | +1.2 | t 1.7 | t 0.5 | −0.1 | −25 | +9 | |

1. Deviation from baseline level, average for **1981-86.**
2. Deviation from baseline level as percent of GDP, **1986.**
3. Deviation from baseline growth rate, average for 1981-86.
4. Deviation from baseline level, **1986.**
   * Major **4.**
   ** Germany.
Source: **OECD.**

higher and later substantially lower than in the baseline, as well as a considerable shift in the global pattern of demand and output. It is not suggested here that such a scenario would necessarily have been either desirable or that it would have been a feasible or likely outcome of particular policy decisions. But as a possible alternative path the **OECD** could have taken, and one that has been investigated elsewhere, it is interesting to use **DEMOD** to investigate how debt indicators might have developed over this period of debt crisis.

Table **12** shows how such developments would have affected the Latin American economy. It is particularly striking that the effects on overall **GDP** would have been relatively small (there is some variation in response, with Chile and Brazil showing rather larger **GDP** gains than average). Throughout the period the Latin American current account would have been rather healthier, substantially **so** from **1983** onwards. Up to **1983,** increased export revenue − resulting partly from higher volume, but mostly from higher dollar prices, themselves a product of the lower dollar − is sufficient only to offset rather higher debt interest payments. But after **1983,** U.S. interest rates are lower than baseline and terms-of-trade gains are beginning to be felt. The improvement in the Latin American current account subsequently stimulates imports, which by **1986** are several per cent higher than baseline, while export volume does not gain further. This increase in import volume is sufficient for the trade balance to have fallen below baseline by **1986,** despite an improvement in the terms-of-trade gains of almost 4 per cent

Table 12. A counterfactual scenario, **1981-86:** impact on Latin America

Change from baseline in percentage points

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|
| GDP | −0.1 | −0.4 | −1.1 | 0.0 | −0.1 | 0.3 |
| Investment/GDP | −0.2 | −0.6 | −0.5 | 0.1 | 0.3 | 0.9 |
| Current account ($ million) | −358 | 534 | 5939 | 12610 | 12209 | 9475 |
| Debt/exports | −7.3 | −29.5 | −39.9 | −53.1 | −69.1 | −66.8 |
| Interest/exports | −1.4 | −0.6 | −2.6 | −6.8 | −7.3 | −9.1 |
| Debt/GDP | 1.9 | 3.2 | 3.7 | 1.8 | −0.2 | −5.7 |

*Source:* OECD.

by **1986.** The effect of this on the current balance is more than offset by lower interest payments.

Domestically, the improved external position allows increased investment. After initial declines, the share of investment in GDP rises, though by **1986** it is higher by only one percentage point. It is partly this rise in investment, of course, that explains the increased import volumes. Given the falls in the investment ratio in **1981-83** it is unlikely that productive potential would have been higher by **1986,** although it would have been on an improving trend.

Despite the rather small impact on the domestic economy, the impact on debt indicators is quite large, though the picture varies according to the indicator. The largest improvement is in the ratio of interest payments to exports. Three factors contribute: the rise in export revenue (which is due more to higher dollar prices than to higher export volume), lower interest rates, and a lower stock of debt. The first two factors are more important than the third: this can be seen from considering the ratio of debt to exports which improves by nearly 70 percentage points − but from a level of over **300** per cent in **1986** − compared with the interest to exports ratio which falls by nearly ten points, but from a baseline level of around 20 per cent in **1986.** The debt to GDP ratio shows even less improvement − lower by nearly **6** points in **1986** compared with a baseline level of over **60** per cent.

**B.** U.S. fiscal adjustment and the debt situation in the 1990s

It remains an important objective of U.S. macroeconomic policy, following the Gramm-Rudman-Hollings Amendment, its revisions, and the most recent

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budget agreement, to ensure that the fiscal deficit is eliminated over the next few years. This period is also one in which the liberalising countries of eastern Europe are expected to attract significant amounts of OECD saving in order to finance increased levels of investment, so the importance of savings and investment developments may be as great over the period 1990-94 as it was during 1981-86. We do not consider developments in eastern Europe explicitly here. But if the targets for the U.S. budget deficit are missed by a substantial amount up to 1994, as they have been in recent years, then the United States, *ceteris paribus,* will absorb a greater proportion of world savings than would otherwise be the case.

The simulation work for this section was done before the 1991 budget agreement. Year by year details of the magnitude of deficit cuts under this agreement are not available at the time of writing, so we retain our earlier analysis. There is no reason to believe that the new formulation would have substantially different macroeconomic effects for any given degree of adjustment in the deficit. Broadly speaking, the cuts under the new agreement would represent a shock up to one fifth stronger than that presented here, though from a rather higher starting point, and beginning only in 1991. If the United States were to have met the (revised) targets of the Gramm-Rudman-Hollings Amendment, as it stood in early 1990, then the budget deficit should decline from $152 billion in fiscal 1989 to zero by 1993. In the scenario presented here, by allowing somewhat faster public expenditure growth, we allow the budget deficit to remain roughly constant in nominal terms from 1990 onwards, thus deviating from the baseline by an increasing amount − $130 billion by 1994.

The impact of this variation in fiscal policy is dependent on the monetary policy response, both in the United States and in the rest of the OECD. In the simulation reported here, we consider the consequences of a strictly non-accommodating U.S. monetary policy, where short-term interest rates move so as to maintain broad money at the baseline level. This policy is followed not only in the United States but also in the other major OECD economies. Consequently, the effects of the fiscal policy change on economic activity are considerably muted with respect to the results of accommodating policy, though they are not negligible, as Table 13 shows.

The initial rise in domestic demand in the United States tends to increase output and inflation. Imports increase and the balance of payments deteriorates. Interest rates rise, by as much as 3 percentage points after two years, thus moderating considerably the increases in output and inflation. Real demand in other OECD countries is also increased somewhat in the early years and hence interest rates increase. As in the United States, while output is initially somewhat higher it falls below the baseline level by the last year of the simulation, as a result of interest rate pressures on demand and output.

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Table 13. Non-implementation of **Gramm-Rudman-Hollings** targets, 1990-94

**Selected OECD variables**

| | Interest rate' | Budget balance[2] | GDP volume[1,3] | | GDP deflator[3] | Current balance[4] | Effective exchange rate[4] | LAT rate deflator' |
|---|---|---|---|---|---|---|---|---|
| OECD | t1.1 | | t0.2 | −0.3 | t0.4 | +11 | | t0.6 |
| USA | t2.2 | −1.8 | +0.7 | −0.5 | +1.1 | t 2 | -4 | |
| Europe | +0.9 | 0.0* | t0.1 | − 0.1 | to.1 | t 8 | +1** | |
| Japan | t0.2 | − 0.1 | to.1 | − 0.1 | − 0.1 | −10 | +1 | |

1. Deviation from baseline level, average for 1990-94.
2. Deviation from baseline level as percent of GDP, 1994.
3. Deviation from baseline growth rate, average for 1990-94.
4. Deviation from baseline level, 1994.
 * Major 4.
 ** Germany.
*Source:* OECD.

There is rather little movement in current account positions. Lower saving by the U.S. public sector needs to be offset by increased saving elsewhere. Rather than this being supplied by non-U.S. savers, in the form of a U.S. current balance deficit, higher interest rates lead to increased saving in the U.S. private sector, more or less completely accounting for the changed public sector financing requirement.

For Latin American debtors there is both good and bad news in this scenario. World interest rates are noticeably higher, particularly dollar rates, which are the ones that matter most to Latin America. On the other hand, the higher inflation in OECD countries gives rather faster growth in Latin American export prices. While OECD activity is lower in 1994 than it would otherwise have been, average activity over the whole period is higher, particularly in the United States, the most important export market. Table 14 shows the results of a combined run of DEMOD and INTERLINK of this scenario.

The impact of the higher interest rates is seen immediately in a deterioration in the balance of investment income; this results in lower investment and imports are consequently reduced. Initially, higher OECD demand allows Latin American exports to increase in volume and there is a substantial improvement in the trade balance. But this improvement is not sufficient to compensate for increased payments of interest on debt and the current balance deteriorates. To start with, the deterioration is not large but OECD demand, after its initial increase, slows

Table 14. Non-implementation of Gramm-Rudman-Hollings targets, 1990-94: impact on Latin America

Change from baseline in percentage points

|  | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|
| GDP | 0.9 | 1.6 | 1.2 | −0.2 | −3.1 |
| Investment/GDP | 0.0 | −0.2 | −0.5 | −0.6 | −0.8 |
| Current account ($ million) | −657 | −3 628 | −7 358 | −10 124 | −12 291 |
| Debt/exports | −7.3 | −13.5 | −9.6 | 0.4 | 16.7 |
| Interest/exports | 1.1 | 3.6 | 5.3 | 5.5 | 4.2 |
| Debt/GDP | −0.4 | −0.3 | 0.6 | 2.0 | 3.8 |

*Source:* OECD.

again, causing Latin American exports to fall back; both export and import prices rise but the terms of trade deteriorate somewhat.

Overall then, external factors in this scenario all work towards a deterioration of debt indicators. When OECD countries follow a non-accommodating monetary policy, any initial benefit that Latin America might receive from higher real demand is more than offset – on the one hand, by the direct effect of the higher interest rates required to keep inflation under control in the OECD, and, on the other hand, from the "crowding out" effect that such interest rates have on demand, after a certain time lag. Despite the initial gains in GDP the debt to GDP ratio for Latin America as a whole is 4 percentage points above baseline by 1994, with the smaller countries showing rather worse deteriorations. The ratio of interest payments to exports also deteriorates.

While two of the debt indicators deteriorate unambiguously, one – the ratio of debt to exports – initially improves quite strongly. This is explained by increases in export volume, reinforced by higher export prices resulting from the initial inflationary pressure in the United States. The fact that the given debt stock is more expensive to service at the higher interest rates is not reflected in this indicator, while it dominates in the ratio of interest payments to exports. However, once the level of debt increases, following the worsening current account position, the fall in the debt to exports ratio is moderated. Subsequently, as export volumes begin to fall back, there is a rapid deterioration in this indicator too.

Table 14 shows that, by 1994, investment would be lower by nearly 1 per cent of GDP; this effect is rather stronger in Mexico and Chile, with falls of 1.4 and 1.5 percentage points of GDP respectively. Partly as a result of lower

investment, but also following the lower exports later in the simulation period, overall GDP is noticeably lower by 1994, after rising somewhat above baseline in the first two years. This is again most marked in Mexico, where GDP is lower than baseline by 3.5 per cent in 1994 and in Chile (lower by 3.0 per cent).

## V. CONCLUSION

This article has analysed the influence of the international macroeconomic environment on the evolution of the debt crisis. It has done so through simulations of the OECD's INTERLINK system in combination with the DEMOD models developed for Latin America. The most important message to emerge is that the international environment matters a great deal for the evolution of the debt situation. The worsening of the debt situation after 1982 was clearly linked to macroeconomic developments in the world economy, although domestic developments were also important, at times even more important. The balance between world savings and investment will continue to be of importance for Latin America, an issue that takes on added importance with the increased demand for funds related to the reconstruction of central and eastern Europe.

While the analysis emphasises the fact that debt indicators are very sensitive to certain kinds of OECD developments, and particularly those related to monetary policy and savings and investment balances, the impact of such changes on domestic Latin American indicators such as investment and growth is much less. Our analysis indicates that under plausible assumptions Latin America could have reached a debt position somewhat better in 1986 than it had been in 1982. However, the underlying productive capacity of the economies would not have changed very much and hence their vulnerability to adverse external developments would have persisted.

The analysis has focused on the contribution of the international environment, but it has also touched upon the role of domestic policies, and has provided some indirect evidence for the importance of the domestic policy framework. It would be desirable to extend the analysis of domestic policies by incorporating domestic policy instruments in the domestic block of DEMOD and providing a generally richer domestic structure, for example by modelling the link between fiscal policies and the debt situation along the lines set out in Reisen (1989). This would permit the analysis of the relationships between performance, structural reform, and the external environment. The importance of structural adjustment could thereby be made more explicit. Another desirable extension of the work presented here would be to model the incentive effects of a debt overhang, in order to compare in a quantitative manner the debt strategies of new money versus debt reduction.

# NOTES

1. This paper concentrates on the middle income debtors, and in particular on those in Latin America (Brazil, Mexico, Argentina, Chile, and the aggregate of **15** smaller countries). The debt crisis is perhaps even more acute in many smaller African and Asian countries. The concentration on Latin America reflects the fact that the aggregate of Latin American debtors is more important than any other debtor group to the world economy, not that debt problems in themselves are more serious here than elsewhere.

2. For a description of INTERLINK, see Richardson **(1988).**

3. It is well known that it may be problematic to equate changes in the debt to export ratio to changes in credit-worthiness. For example, the debt to export ratio may simply improve because the country cannot get any new loans, i.e. because the country is not credit-worthy. Nevertheless, most analysts agree that the debt to export ratio is in most cases a reasonable indicator to gauge changes in credit-worthiness, though it has to be inter-preted with caution.

4. On the relationship between external debt and domestic macroeconomic performance in general (Fischer, **1990).**

5. This may also be taken as an implicit recognition of just how dangerous the situation had previously been for many banks. Further, the absence of a risk of technical insolvency would not at all mean that all the banks in question would have remained commercially viable in the event of such a write-off.

6. The net debt to export ratio is defined here as gross external debt minus official reserves. Financial assets held abroad by private citizens are not taken into account in this defini-tion. It is worth noting, however, that private assets held abroad are usually significant for Latin American countries, sometimes exceeding official debt. This indicates that the debt crisis is more a crisis of the public sector than a crisis of entire countries (Reisen, **1989).**

7. The relationship between debt, growth, and credit-worthiness is analysed by Selowsky and van der Tak **(1986).**

8. The impact of debt reduction on economic activity is discussed by Dooley *et al.* **(1990).**

# DEMOD: MACROECONOMIC MODELS FOR LATIN AMERICA

This section provides only an outline of the structure of DEMOD, sketching the main paths of interaction between the OECD countries and the models of debtors countries, and outlines the structure of the domestic part of the models. A fuller description, with detailed equation listings and details on estimation procedure and simulation properties is in Dittus and O'Brien (1990). INTERLINK is described in Richardson (1988).

The major purpose of DEMOD is the analysis of the impact of OECD economic policies on middle-income debtors, and a quantification of the macroeconomic linkages. To this end we have developed models which: *i)* are based on individual country data for some major Latin American economies and include simple but useful representations of internal macroeconomic relationships; *ii)* are set up to match INTERLINK's structure of international trade relationships, allowing direct interaction between the two sets of models; *iii)* are based on a closer look at individual country data on debt structure than was possible in the development of INTERLINK's investment income equations.

Latin America (which is defined here to exclude Venezuela, treated as part of OPEC in the INTERLINK classification of non-OECD countries) is not modelled as one country, but using individual country models which are simulated separately and their results aggregated. This approach has some obvious advantages. It allows individual country differences – such as different countries' ability to transform additional external resources into income growth – to be taken into account. The focus on individual countries is also a prerequisite for linking country-specific information to the macroeconomic behaviour of Latin America as a whole, an advantage in the context of the OECD's periodic forecasting exercise.

DEMOD thus consists of five country modules – Brazil, Mexico, Chile, Argentina, and the aggregate of 15 smaller countries – each module having the same structural skeleton, presented in Chart 5. Variables exogenous to the country model are on the left hand side. These include the "economic environment" variables that DEMOD takes directly from INTERLINK: Prices for imports and exports, market growth for Latin America, the U.S. short-term interest rate, and the nominal effective U.S. dollar exchange rate. Additional exogenous variables are the inflation rate and the real exchange rate *vis-à-vis* the U.S. dollar. After the model has been solved, import demand is fed back to INTERLINK.

Ideally, a full macroeconomic model of each debtor country would be developed. Resource constraints led to the adoption of a less ambitious approach. Thus, while DEMOD features endogenous output determination, the output block has been kept small, designed to capture just a few essential aspects of external shocks on domestic growth performance. The domestic financial sector has not been modelled. The models thus consist of three blocks: the Output block, the Trade block and the Debt block. In addition, there are simple debt accounting models

CHART 5
# FLOW DIAGRAM OF THE DEMOD MODEL STRUCTURE
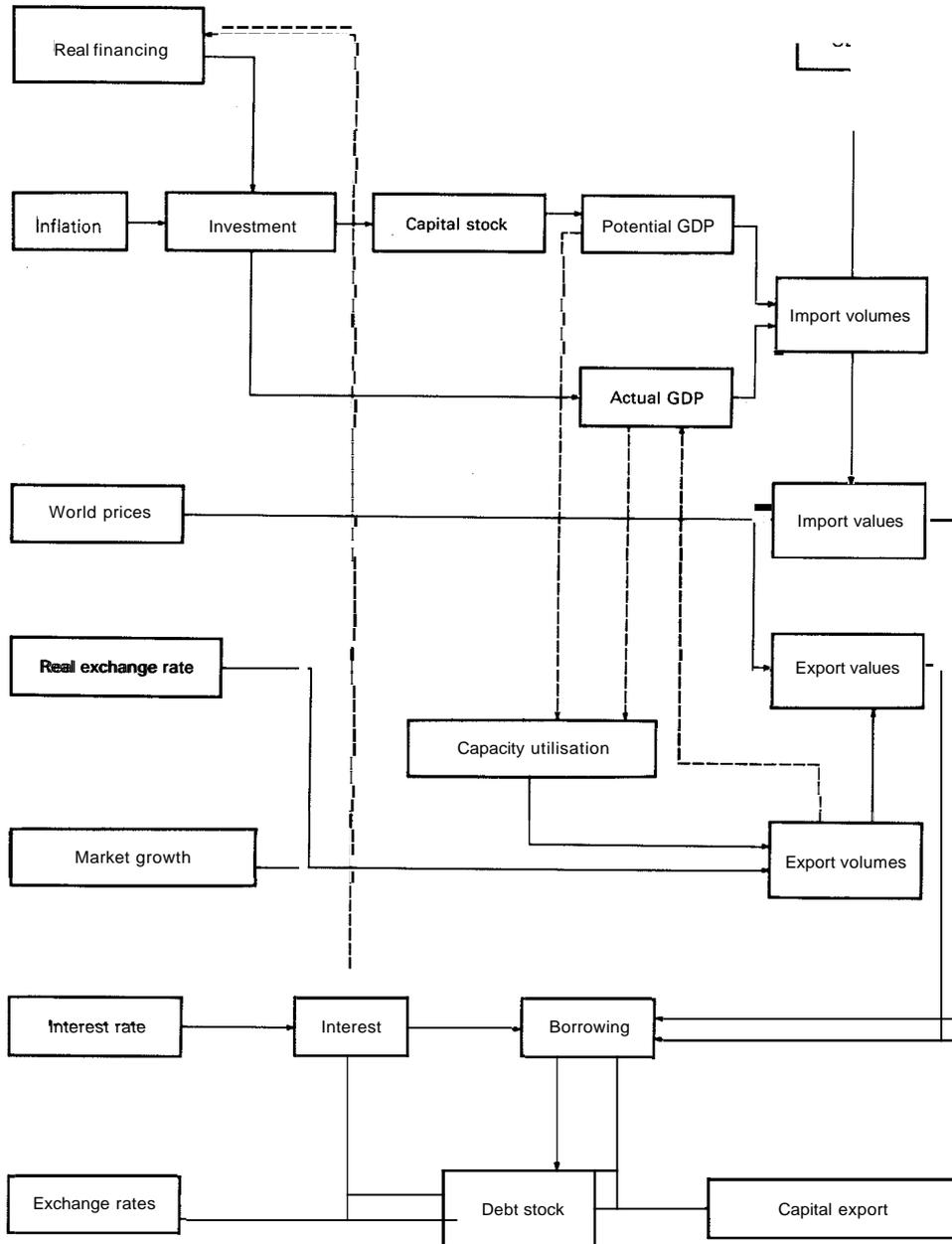
for a number of other debtor countries (referred to as HICs — Highly Indebted Countries), not all of which are in Latin America; these models take balance of payments information from DEMOD and INTERLINK to give estimates of the impact of simulations on each country's debt to exports ratio.

## A. The output block

The output block calculates potential and actual GDP and it is here that the main domestic macroeconomic relationships are incorporated. Potential output depends on the capital stock and on a time trend (representing both increases in the labour force and technological progress). Actual output, rather than being derived — as for example in INTERLINK — from the sum of its expenditure components, is determined directly in a partially reduced form as a function of investment and exports.

Of domestic demand components, only investment is determined endogenously, permitting endogenous variation in the capital stock and potential output. In addition to net external flows, inflation is an important conditioning variable in the investment equation, as a proxy for the macroeconomic framework. A major weakness of this version of DEMOD is the absence of any variable representing government policy, other than the rate of inflation. Lack of adequate and easily available statistics on government finance ruled out the use of a direct measure of fiscal or monetary policy at this stage. The inflation rate was used, not in the expectation that one could use it to study the impact of changes in policy, but as a crude conditioning variable, in an attempt to improve estimates of other parameters in the equations. Other analysts have found the rate of inflation a useful proxy for the policy framework of developing countries (e.g. Kormendi and McGuire, 1985).

Real net external finance is defined as inflows of long term finance net of amortisation and interest payments, expressed in constant dollars. It thus has an exogenous and an endogenous element: net flows are exogenously given, but interest payments are endogenously determined by DEMOD. Thus investment depends on foreign interest rates indirectly, via their effect on available finance. Brazil is an exception here; it was not possible to identify a positive correlation between external finance and domestic investment. The debt to GDP ratio is quite strongly negatively correlated with investment in Brazil, however, and has been included in the equation; this may be considered as evidence for the debt overhang hypothesis though it may well also be accounted for by omitted variables, such as stabilisation plans, precipitated by the debt situation.

This output block — despite its simple form and a number of shortcomings — allows the state of the world macroeconomy to directly influence economic performance of debtor coun- tries. The key variables in this linkage are: *i)* the U.S. short-term interest rate; *ii)* OECD output growth; *iii)* net flows to debtor countries.

The link between net real lending and investment is a key feature of the output block. Basically the approach taken here is to model Latin America as finance constrained. This is, however, a "soft" constraint. DEMOD does not impose that additional exports or finance lead to an exactly equivalent rise in imports. Such additional finance will be used to increase imports, but part may also implicitly be used to increase reserve holdings or other assets abroad.

In this context, another modelling choice may be of interest. There is agreement that the reduction in real lending that occurred in 1981-82 was a key factor in the decrease of investment and the ensuing slowing of growth. There is less agreement with regard to the mechanism by which this shock was transmitted. One possibility is that reduced net lending led to reduced imports, which in turn then caused declines in investment. The other possibility is

that reduced net lending led to cancellations of investment projects, which in turn led to declining imports. While it is quite likely that both channels are at work simultaneously, the data do not offer the scope for modelling both. For DEMOD, using real net lending variable to determine investment was the preferred solution, in particular because such a model tracks better. A model using the alternative approach gave roughly the same current account changes in response to a given shock to external finance.

## B. The trade block

DEMOD breaks trade into the same four categories — manufactures, raw materials and food, energy, and non-factor services — as INTERLINK (except that INTERLINK separates food from other raw materials). Export volumes depend basically on market growth, modified by domestic capacity utilisation. Only in the case of Brazil could a statistically significant competitiveness effect on exports be established, in the form of the real exchange rate. Imports are broken into the same categories as exports. In each category, import volumes are determined by domestic activity variables and capacity utilisation. Again, as for exports, it proved impossible to identify significant competitiveness effects.

Trade prices determined in INTERLINK, and therefore the same (in each category of trade) for each of the DEMOD countries, are used to calculate the dollar value of imports and exports.

## C. The debt block'

The debt block is basically a standard debt accounting module. It calculates debt and asset stocks dynamically over time, and uses them to determine factor service payments. Creditworthiness indicators like the debt to GDP ratio, the debt to export ratio, and the interest to export ratio are also calculated in this block.

Changes in debt stocks depend on two factors: net borrowing, and valuation adjustments. While DEMOD accounts are in U.S. dollars, part of the external liabilities are in other currencies. Changes in the effective nominal rate of the U.S. dollar *vis-à-vis* other currencies are used (EXCHE from INTERLINK), together with estimated non-dollar shares of debt, to derive valuation adjustments to the U.S. dollar stock of debt.

Capital exports are (mostly) unobserved but can be calculated ex post by residual, given the valuation adjusted change in debt stocks, net direct foreign investment, reserve changes and the current account balance. It would not be appropriate to view the derived capital exports figures solely as capital flight. Inter alia, it includes errors and omissions in the balance of payments, "legal" capital exports including trade finance, and errors in the estimation of the non dollar debt share. Nevertheless, the capital export variable bears a certain resemblance to patterns of capital flight analysed in other studies.

Investment income payments and receipts are calculated as multiples of estimated rates of interest on stocks of assets and liabilities. Debits on factor services consist mainly of interest payments on foreign debt and credits are treated as if they consisted entirely of interest receipts on reserve holdings. Average rates of interest on debt and assets are modelled as functions of dollar interest rates, taking into account information on the shares of long and short-term debt in the total, as well as that part of debt which is at fixed interest rates (this was still quite high in the second half of the 1970s).

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1. Our work builds on Saunders and Dean (1986).

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