



International Economics Department
The World Bank
August 1989
WPS 253

Public Debt, North and South

Helmut Reisen

Why has government debt risen since 1984 despite rationed foreign lending and efforts at fiscal consolidation? And how can the rising debt be stopped? Possible remedies are growth-oriented fiscal adjustment, improved debt management, and voluntary debt reduction.

The recent rise in *domestic* public nonmonetary debt and in domestic bond yields is imposing a heavier burden on governments in countries like Brazil and Mexico than foreign debt does. This is a relatively new experience for developing countries but not for OECD countries.

Reisen's discussion of rising government indebtedness, therefore, includes the experiences of four developing (Brazil, Mexico, Korea, and Indonesia) and three highly indebted OECD countries (Belgium, Ireland, and Italy). (Neither are the former four, especially Korea and Indonesia).

Why, Reisen asks, has government debt been rising since 1984 despite rationed foreign lending and efforts at fiscal consolidation? He finds the major determinants of debt to be:

- External transfers, which imply an internal transfer of resources from the private to the public sector.
- Fiscal rigidities, because of failure to broaden tax bases and cut government consumption.
- High interest rates coupled with low growth

of GDP, both explained largely by depressed savings and investment.

- Massive devaluation of the real exchange rate and big swings in value among key currencies.

How can the rise in government debt be stopped in the long run? *Not* through a burst of inflation, even when it is largely unanticipated — because the demand for base money is now too small relative to public domestic debt. *Nor* through domestic and foreign default — unless the government runs a substantial primary surplus (which is mostly not the case) and can credibly commit to not defaulting again (which is unlikely).

Possible remedies, Reisen suggests, are growth-oriented fiscal adjustment, improved debt management, and voluntary debt reduction. He calculates the noninterest surplus governments would have to run to stabilize (and then reduce) public debt ratios and make their budgets consistent with other macroeconomic targets. He also discusses how fiscal adjustment can foster growth at the same time that it minimizes real depreciation of the exchange rate and reduces the cost of domestic public debt.

This paper, prepared for the conference "Dealing with the Debt Crisis," is a product of the Debt and International Finance Division, International Economics Department. Copies are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Sheilah King-Watson, room S8-029, extension 33730 (34 pages with tables).

The PPR Working Paper Series disseminates the findings of work under way in the Bank's Policy, Planning, and Research Complex. An objective of the series is to get these findings out quickly, even if presentations are less than fully polished. The findings, interpretations, and conclusions in these papers do not necessarily represent official policy of the Bank.

Public Debt, North and South

**by
Helmut Reisen**

Table of Contents

I. Why Government Debt is Still Rising	1
II. How the Rise in Government Debt Cannot Be Stopped	14
III. Possible Remedies	16
References	22
Tables	24

A cross-country study on developing country problems usually compares the Good, the Bad, and the Ugly within the Third World. This paper will include Belgium, Ireland and Italy to discuss some relevant aspects of public developing country debt. These three countries belong to the front league of high-debt OECD countries, and their public debt relative to GDP is considerably higher than the corresponding ratio of the prominent LDC debtors. Yet for these developed countries, a perception of insolvency has not developed. It may be useful to include them in the sample because economic theory provides little, if any, guidance on whether there is solvency or a critical debt ratio. A further reason to have a side-look at high-debt OECD countries is their largely unrepressed financial setting. This may allow some conclusions about likely feedback of economic liberalisation as well as some insights into debt management. Last but not least, the recent rise in domestic public non-monetary debt and in domestic bond yields in countries such as Brazil and Mexico is imposing a heavier interest burden on the affected government than foreign debt. This is a relatively new experience for developing countries, but not, however, for OECD countries.

The sample will be completed by Brazil, Mexico, Indonesia and Korea, four major clients of the World Bank with very different characteristics, in order to try to answer three questions. First, what explains rising government debt in spite of rationed foreign lending and efforts at fiscal consolidation (the external and internal transfer problem; the political economy of taxes, non-interest spending, and inflation; interest rates and growth; devaluation and cross-currency movements)? Second, how can the rise in government debt almost certainly not be stopped in the longer run (hyperinflation; foreign and domestic default)? And, third, what are the possible remedies (growth-oriented fiscal adjustment; improved debt management; voluntary debt reduction)?

I. Why government debt is still rising

Because of differences in the definition of the public sector, international comparisons of public debt ratios are very precarious. Less arbitrary is a comparison of changes in debt ratios. Table 1 demonstrates for the 1980s the sharp rise in government debt as a fraction of GDP in all countries except Korea. Except for Indonesia, where domestic debt is nil, and

Italy, which has almost no foreign debt at all, the structure of public debt is now more similar for countries like Brazil, Mexico, Belgium and Ireland. The picture is puzzling at first sight: we observe the highest debt ratio in Belgium and Ireland, where there is no "debt crisis". In Brazil, Mexico, and Indonesia, the reduction in foreign borrowing has gone along with a rapidly rising foreign debt ratio. External transfers have done nothing to reduce government indebtedness when they were prematurely imposed from abroad.

(Table 1)

1. External Transfers and the Government Budget

The link between the external transfer of foreign exchange from debtor countries' governments to foreign creditors and the internal transfer of resources from the private to the public sectors is now well understood (Reisen, van Trotsenburg, 1988; Reisen, 1989). A regrouping of the government budget identity, which usually shows the link between the public borrowing requirement (fiscal deficit) and external and internal sources of finance, makes the interaction of external and internal transfers immediately apparent.

$$(r^*b^* - \dot{b}^*)e = (t-g) + (t^*-g^*)e - rb + \dot{M}/P + \dot{b} \quad (1)$$

Equation (1) links the external public transfer -- the difference between interest payments, r^* , on net foreign public debt (gross debt minus foreign exchange reserves), b^* , and new net foreign lending, \dot{b}^* , to the domestic sources of financing. The latter are tax revenues, t and t^* , the reduction of non-interest public outlays, g and g^* , and of interest payments on domestic public debt, rb , the increase in real base money, \dot{M}/P , and net new domestic non-monetary domestic public debt. Asterisks denote the variables which depend on international prices and e , the debt-weighted real exchange rate, converts them into local currency. All variables are adjusted for domestic inflation. If the budget identity as defined above captures the

entire public sector, incorporating all government levels, public enterprises, extra-budgetary funds, and the central bank, then it adequately measures the government's claim on real private resources. One instrument to obtain these funds is yet higher (domestic) government debt. But a closer look on debt determinants will reveal that external transfers do not account for all, and need not account for any of the rise in government indebtedness.

2. Debt Dynamics

To identify exactly where the debt problem lies, equation (1) has to be transformed into a debt-dynamics equation:

$$x_t = x_{t-1} [(1-f)r + f(r^*+e)-n] - [t-g + (t^*-g^*)e] - (p+n)m \quad (2)$$

where x is the total public debt ratio

f is the percentage share of foreign debt in total public debt

n is the growth rate of GDP

p is the inflation rate

m is the ratio of base money to GDP

and where the other variables introduced above are now expressed in percentages of GDP.

(Table 2)

Table 2 helps us understand why the debt/income ratio stopped growing in Korea and rose rapidly elsewhere during the past five years. Korea could afford a primary deficit (albeit a moderate one) because extraordinary GDP growth powered ahead of interest rates. In contrast, Mexico was the only country to run a primary surplus (almost 4 % of GDP), but this did not offset the combined impact of negative growth, high interest rates, and (summing up the ups and downs of its real exchange rate) of heavy debt-weighted

devaluation. Next to primary balances and the difference of interest rates and output growth, the table reveals the foreign exchange rate as an important debt determinant. It has two components: a devaluation of the local currency relative to the dollar to improve external competitiveness (to generate external transfers or to cope with other external shocks), and movements in the dollar value of key currencies like the yen or the deutschmark. The foreign exchange rate was of outstanding importance in Indonesia where most public debt is in hard currencies such as the yen, and where all public debt is foreign. Before 1984, during the first phase of the debt crisis (when rationed lending forced the debtor countries to switch their trade balances from deficit to surplus), the exchange rate also had a major impact on public debt ratios in virtually all problem debtor countries. In spite of high inflation in Brazil and Mexico, monetary finance did not help to transfer more real resources from the private to the public sectors there as it did in Italy where inflation had been brought back to a one-digit level. High inflation taxes were almost outpaced by negative seignorage since the demand for real base money fell rapidly.

A closer look at each of the debt determinants given in Table 2 will tell us more about their nature and thus will help us form some ideas about future debt growth.

3. Tax Collection, Non-Interest Spending, and Inflation

When is there a public debt problem? The intertemporal budget constraint provides no satisfactory answer to that question because it is compatible with cases of an ever increasing debt-income ratio and because it spreads over an infinite horizon. More binding is Spaventa's (1988, p. 16) definition of feasibility: "If there are perceived social and political limits to the government's ability to reduce expenditure and to increase taxation net of transfers, ... there are also limits to the level of the debt ratio which is compatible with a credible commitment on the part of the government to meet the intertemporal constraint".

Spaventa's definition conveys the central message of why public debt easily turns pathologic in many developing countries and why it does so less easily in richer countries. Tax ratios of developing countries tend to be much lower, generally less than half of the average tax ratio of industrial

countries. There have been rare instances (Indonesia) among developing countries where it has been raised in the medium run by several percentage points of GDP, as has happened in some developed countries such as Ireland and Italy (see Table 3).

(Table 3)

Why has there been so little tax adjustment in problem debtor countries? There may be three views on that question. First, supply-siders would relate disappointing tax collection to the microeconomic details of tax structures, in particular to marginal tax rates and the real income level to which these rates apply (Reynolds, 1985). Table 4 takes them to task. It shows for personal income taxes the top marginal rates, the associated taxable income threshold (in thousands of dollars), the ratio of this income to per capita GDP (as a proxy for bracket creep), and the fiscal yield of personal income tax as a percentage of GDP. Table 4 may tell us a lot. It shows that tax pressures intensified in Brazil, Belgium and Ireland, but did not raise tax revenue in Brazil. It shows that personal income tax is an important source of revenue in OECD countries, but that it is negligible in the South. It also shows that reduction of top rates (Korea, Indonesia) and of bracket creep (Indonesia) may produce more tax revenues, albeit the increase has been moderate. But the table does not explain why the fiscal yield on personal income tax has been almost nil in Argentina and Brazil.

(Table 4)

A second view holds that depressed tax revenues have in part been the immediate consequence of the debt crisis itself. Lower levels of consumption, profits, wages, per capita incomes, and imports, mostly unavoidable for effectively restraining overall demand, also meant shrinking tax bases. Moreover, the Tanzi effect -- important losses of real tax revenues associated with the acceleration of inflation -- was confirmed in problem debtor countries. Since progressive income taxes represent only a small share of total tax revenue in developing countries, fiscal drag is insignificant. A

high proportion of taxes levied with specific rates and the long lags in collection lead to inflation-induced losses for the governments (Tanzi, 1977). But automatic (de-)stabilizers do not tell the full story.

Low tax ratios combined with standard tax rates, bracket creeps and low fiscal yield suggest a third view: the failure to broaden the tax base is crucial in explaining persistent debt-servicing problems in many developing debtor countries. Administrative and technical bottlenecks in tax assessment, levying and collection prevent tax revenues from rising, and powerful interest groups have often prevented a reform of tax legislation aimed at abolishing tax holidays and exemptions. This became particularly apparent in Brazil in late 1987 when the Finance Minister resigned after an unsuccessful attempt to enforce a tax reform aimed at enlarging the tax base. The architect of Mexico's tax reform, Francisco Gil Diaz (1987), reports that "considerable political resistance" has frustrated the elimination of tax shelters for truckers, agriculture, publishers and other groups, sectors to which profits are easily relocated. In Argentina, the cigarette tax alone collects 25 per cent more money than the profits, capital and net asset taxes combined. A mere 4.8 per cent of the companies figuring on the gains tax roll paid any tax at all in 1986 (The Review of the River Plate, November 27, 1987).

Repeated failures of stabilisation attempts in Argentina and Brazil as well as interwar evidence from Europe suggest that you cannot expect thorough fiscal reform in countries which Alesina (1988) defines as in an "unstable" political situation. "In an 'unstable' political situation, distributive disputes over which taxes to increase (or which type of transfers to reduce) generate fiscal deadlocks which undermine the government's ability to increase explicit tax revenues. This situation occurs if each group has enough power to 'block' explicit taxes on itself but not enough political influence to impose explicit taxes on others". This situation is to be contrasted with a "stable" situation where one political side controls economic policy decisions based on a solid majority (say, Indonesia) or based on a lack of polarisation between political groups (say, Columbia) and is thus able to impose the burden of public debt on groups that are not represented in the government. Alesina's concept goes back to Keynes' Tract (1923) which was concerned with the distributional effects of a growing stock of public debt -- the domestic transfer from those who pay the taxes that service the debt (workers, entrepreneurs) to those who hold the debt (rentiers).

External transfers have encouraged growing domestic public debt, and fiscal deadlocks have forced their monetisation. Inflation is the residual outcome. It had already been observed by Clark (1945) that in several European countries in the interwar period, there seemed to be a limit to the tax ratio. Every time this limit was reached (at about 25 per cent) inflation increased. While the (mainly wartime) increase of tax ratios in OECD countries since then has made Clark's observation obsolete for the rich countries, it seems confirmed again in some Latin American countries of the 1980s.

(Table 5)

Table 5 demonstrates that in Argentina and Brazil the political situation was "unstable" while it was not so in Chile, Columbia, Indonesia and Korea, where non-inflationary fiscal adjustment could be observed. Mexico was an in-between case. The year after tax ratios peaked in Argentina (1980, 1986) Brazil (1982) and Mexico (1986), again at about the level observed during interwar Europe (25 %), inflation accelerated by 50 % in all three countries and doubled two years after the tax ratios peaked.

But as was already shown in Table 2, with the demand for base money falling, there were limits to the quantity of resources that governments could acquire through the inflation tax. If they pushed the inflation rate beyond those limits, they ended up with smaller real resources. This explains why currency reform in Argentina, Brazil and Bolivia was inevitable and also explains the timing of those reforms. The timing of reform in each country was closely related to reaching (Brazil) or exceeding the maximum yield from the inflation tax.

When interest rates outpace GDP growth, the need to pay growing interest outlays impedes cuts in overall spending (and tax burdens). This observation is widespread: it holds for the OECD on average, for high-debt OECD countries in particular, and there is thus little reason to believe why that should be different for developing debtor countries. Table 6 reveals, however, that cross-country differences are important. In "unstable" cases like Brazil and Italy, cuts in current outlays such as subsidies and public salaries were anything but existent and raised by 4 percentage points of GDP. The opposite was observed in Belgium and Korea where current public spending

was reduced by about 4 percentage points of GDP, as well as in Mexico (2 1/2 %). Even if cuts in non-interest public spending were important, they were rarely "growth-oriented", since they often concentrated on capital expenditure. To the extent that these cuts hit infrastructure capital rather than "white elephants", they lowered the productivity of complementary private-sector capital, the profitability of private investment and future output growth.

(Table 6)

4. Interest Rates and GDP Growth

Much of the increase in public debt ratios has been unrelated to deficits in the government budgets. As shown in Table 2, the difference of real interest rates over real GDP growth accounts for one third in the lowest case (Italy) and two thirds in the highest case (Mexico) of the relative debt increase in recent years (since end-1983). Thus, for a country like Mexico, you can easily imagine a disaster scenario in spite of its primary budget surpluses: debt service replaces investment and hence reduces output growth and the tax base; this process feeds on itself until no resource base is left from which to service the public debt. It is thus important to know to what extent public finance can contribute to higher growth and lower interest rates, and to what extent it cannot.

Pooled time-series/cross section regression estimates reported in the 1988 OECD Survey of Belgium identify the budget deficit/private saving ratio as a significant determinant of real bond yields. The ratio explains a third of the increase in bond yields from 1979 to 1983 as well as a third of their subsequent decline. A further third is explained by the US bond yields, indicating that their determinants, e.g. the US deficit/savings ratio, are important concerns for the OECD at large and all the more so for developing countries where the foreign share in public debt is higher.

In countries such as Mexico, however, real bond yields have failed to decline with falling operational deficits (which corrects for the inflation component in the government's interest outlays). This may be due to the fact

that debt-income ratios have continued to rise and that they matter for interest rates more than the deficit itself. Apparently, the savers have taken into account the risks of imminent default and inflation by requiring correspondingly higher interest rates on domestic government debt.

High inflation, excessive minimum reserve requirements and forced sales of government bonds have enlarged the wedge between the interest yield for domestic savers and the interest costs for domestic borrowers. Returns on savings are often too low to mobilise saving for capital formation while credit costs are too high to finance even profitable investment. The concomitant losses of efficiency and opportunities for growth are often exacerbated by the fact that rationed credit is extended to favored (big or public) enterprises at preferential interest rates.

When the public budget deficit exceeds the current account deficit, the public-sector borrowing requirement has to be matched by a surplus of private-sector savings over investment (Table 7). Public sectors then become net users of household and corporate saving which are then unavailable for private investment. This explains why investment levels are so depressed in many problem debtor countries, such as Mexico, and why they are up in Korea (in spite of massive external transfers).

(Table 7)

Brazil and Italy's experiences reveal, however, that the negative output effects of fiscal deficits can be offset to some extent. This is not due to "tax discounting", certainly not in the countries characterised above as being "unstable". Taxpayers do not increase private savings to prepare for future taxes that governments will eventually have to levy to pay increased interest payments on their debt. Why should they, when they can easily evade taxation? Even in the majority of OECD countries, the tax-discounting factor appears to be close to zero (Nicholetti, 1988). But fiscal deficits can displace private consumption and lure savers into purchasing public debt when high real rates of return are offered and near substitutes of treasury bills are taxed (Italy) or unhedged against high inflation (Brazil).

For the output effect of a given fiscal deficit, much depends on the (incentive) structure of taxes and public spending. If countries such as Argentina intensify the tax pressure on traditionally convenient tax handles such as export production, agriculture, and domestic financial assets, their disappointing performance in savings, exports and output growth should come as no surprise (Reisen and van Trotsenburg, 1988). Output growth depends equally upon the composition of government expenditure. But, as Buffie and Sanguines Krause (1989) demonstrate in a formal model applied to Mexico, only cuts in government consumption equal to the debt service increases succeed in maintaining the existing growth rate without intensifying inflationary pressures. Cuts in public infrastructure capital formation instead not only lower the nation's overall investment, they also depress the profitability of private investment which then translates into lower growth, lower savings and lower taxes.

The evidence sketched here confirms the hypothesis that government policies in general and the public budget in particular do matter for the relationship of GDP growth and interest rates. But much depends on the United States and some other important OECD countries, as has already been reported for the impact of US bond yields on interest rates worldwide. Apart from bargaining, developing debtor countries exert no influence on the pure interest cost of their foreign debt. Needless to say, average GDP performance in developing debtor countries depends heavily on OECD growth and OECD macroeconomic and trade policy.

5. Real Devaluation and Cross-Currency Movements

While the reduction of domestic public debt tends to reduce interest rates, efforts to reduce foreign debt generally call for a real devaluation of the exchange rate below purchasing power parity to generate the real transfer (trade surplus) for foreign debt service. The size of the shift in real exchange rates that is called for becomes very large when external borrowing (putting upward pressure on the exchange rate) and subsequent external transfers take on massive proportions and are squeezed within a short period. Real effective exchange rates (trade-weighted) of major developing debtor countries are now often 40 % below their 1980-82 average. Add to this the important swings in the value among key currencies -- e.g., the yen has

appreciated more than 100 % against the US dollar -- and it is obvious why changes in the foreign exchange rates have mattered so much for debt dynamics.

Problem debtor countries like Brazil and Mexico suffered the heaviest capital losses due to real devaluation during 1982/83 when their foreign public debt ratio doubled. Debt-weighted real annual devaluation also accounted for much of the rising public debt ratios during 1984-87. For the latter period, it explains for 85 % of the rise in the public debt ratio in Indonesia which engineered massive devaluations, and where all public debt is foreign and most of that debt is in yen and other low-coupon currencies. Debt-weighted real devaluation accounts for 27 % of the rise in the debt-income ratio during 1984-87 in Brazil and Mexico.

Devaluation also has an immediate impact on the government budget. The impact is likely to be negative in the typical (largely inward-oriented) problem debtor country. The rise in tax receipts and new inflow of foreign finance are too limited to make up for the rise in local-currency costs of servicing foreign debt following a devaluation.

While the immediate consequence of a sustained real devaluation is a proportionate rise in the real interest payments on foreign debt, its impact on the non-interest part of the government budget is much more difficult to determine. The budget is likely to be affected by devaluation, either because of resultant changes in prices (price effect) or because of changes in various tax bases induced by changes in wages, corporate income, or export and import volumes (output effect).

A sustained real devaluation raises, by definition, the prices of tradable goods relative to non-tradables. To analyse the price effect, it is therefore useful to break the non-interest budget deficit (or surplus), down into those taxes and expenditures that depend on home prices and those that depend on world prices. In other words, the government has a deficit (or surplus) in nontradables, and another in tradables [see equation (1)].

For example, expenditure on nontradables are public sector salaries and on tradables imported capital goods, while tax receipts fall on nontradables like taxes on labour and on tradables like trade taxes. A government of an outward oriented economy (such as Korea) or with an important public mineral sector (such as Nigeria) is more likely to profit from devaluation than a government of an inward oriented economy without export oriented public enterprises (Brazil, for example). In the latter type of country, the dollar

value of tax receipts which arises to a large part from taxes on nontradables will tend to fall while the reduced dollar value of spending on nontradables does not fully offset the losses in tax receipts.

Without exchange rate overshooting, a real devaluation exerts a negative price effect on the public budget when the real interest on net external debt plus the non-interest budget deficit on tradables exceeds new net external debt (for a formal exposition, see Reisen, 1989). To put it differently, a real devaluation is likely to improve the fiscal situation only when the public budget on tradables is in an initial surplus or when the net foreign exchange flow (new debt minus interest) to the government is positive.

It has been argued that in an open economy context real interest rates on domestic debt can fall, provided the exchange rate overshoots (Ize and Ortiz, 1987). If the exchange rate initially depreciates, expectations of future appreciation would create a wedge between returns in domestic and foreign currencies, which would allow for debt servicing on local currency debt to fall. But even with overshooting, a devaluation will exert a negative fiscal impact when the foreign currency portion of public debt plus the initial deficit based on tradables is higher than the savings made on domestic currency debt.

A further channel through which exchange rate adjustment may worsen fiscal imbalances is associated with the widespread existence of multiple exchange rates. They have an implicit tax-subsidy structure (Dornbusch, 1986) which may finance a part of the government budget. With multiple rates, imports can be taxed by a high price of foreign exchange, and likewise exports by a low exchange rate at which foreign exchange earnings must be surrendered. On the other hand, the multiple rate system may also be utilised by the government to subsidise imports or exports through preferential rates. The net fiscal revenue from the multiple rate structure depends on the excess of proceeds from foreign exchange sales over the revenue from purchases.

Devaluation tends to reduce the differential between the official and black market rates. Devaluation may also be accompanied by a full unification of multiple rates. It has been shown that the elimination of the exchange rate differential has led to a sharp drop in the implicit export and import taxes when the affected government had been a net seller of foreign exchange (Pinto, 1987). In a similar way, in Mexico financial losses associated with

exchange rate differentials between dollar assets and debts of the nationalised banks in the wake of devaluation added 4 per cent of GDP to the consolidated public deficit in 1982.

The second component of the debt-weighted exchange rate are the swings in the value among key currencies, like the dollar, the yen, and the European currencies.

When these swings become as important as those experienced in the 1980s, the currency composition of foreign debt can be shown to dwarf cross-currency differences in interest rates as a determinant for foreign debt service costs. Changes in the conversion value of outstanding debt plus the interest effect of these changes outweigh the pure interest effects in the comparison of alternative debt portfolios as a function of a) the level of outstanding debt; b) the currency structure of that debt; c) the variance and co-variance of key exchange rates and d) the differences in interest rates among different key currencies.

Most developing nations are unhedged against the risks of exchange rate changes between key currencies. They may face institutional barriers or too high transaction costs which prevent them from participating actively on the future markets. But they can minimise their exchange risk exposure by matching the currency mix of their debt with the currency mix of their cash flows.

The World Bank is now the biggest net lender to highly indebted countries, but its currency pool seems particularly inadequate for almost all developing countries because it tends to increase their foreign exchange risk exposure for the benefit of a very questionable reduction in the pure interest cost of the Bank's lending. The World Bank shifts exchange rate risks to the debtor countries by lending the proceeds of the borrowings in the same currencies in which they were borrowed (Lonaeus, 1988). Since 1980, the currencies used for disbursements are pooled, and all borrowers owe the bank the currencies in the pool in the same proportions. Apparently misguided by the endeavour to reduce the average interest cost of borrowings, the Bank has even used currency swaps to concentrate its currency mix even more in "hard" currency than before swaps.

Calculations for Indonesia show that if it had matched the currency mix of its foreign debt with the currency structure of its cash flows, it would not only have minimised the foreign exchange risk of cross-currency

fluctuations, but also would have saved around 10 billion US dollars during 1985-88 against its actual currency composition. On the other hand, had the Indonesian government followed the World Bank's debt management practices, it would have lost about 6 billion US dollars during the same period in comparison to its actual debt structure (Reisen, 1988).

II. How the rise in government debt cannot be stopped

The subsequent discussion brings us right into the field of dynamic consistency. At first sight, hyperinflation and unilateral default would seem appropriate devices to do away with government debt. Recent evidence suggest that they do not work. This does not imply that unallied monetary restraint would help.

1. Inflation Blow-Out

An unanticipated burst of inflation has helped Argentina (1982) and Mexico (1983) reduce part of domestic public debt and real cost of debt service. Such a strategy of inflicting "surprise" capital losses on domestic bond holders has become increasingly ineffective as a means to alleviate the public debt burden. First, maturities of government bonds are now extremely short-term. In Brazil, 90 % of the government's deficit is financed in the overnight market. In Mexico, the respective maturities are down to four weeks. Moreover, public debt in problem debtor countries is often contracted on a floating-rate base or fully indexed to price inflation.

(Table 8)

Second, rapid monetisation of government debt would not bring much anymore because most problem debtor countries are by now extremely demonetised. Table 8 demonstrates this point. The money base is now about 2 % of GDP in Brazil (down from 3.5 % in 1981), and 4.5 % of GDP in Mexico (down from 15.9 % in 1981). A policy that doubled the money base in a week (e.g. through open market purchases) would reduce publicly-held debt by a mere 11 % in both Brazil and Mexico. Note that the respective figures are even lower for Belgium and not significantly higher for Ireland and Italy. Consequently, an inflationary erosion of domestic public debt does not work and would not justify the subsequent costs of inflation.

2. Default

Outright default, be it on foreign or on domestic debt, cannot prevent further growth of public debt unless tax revenues exceed non-interest spending. This condition seems only satisfied in Chile and Mexico. In addition, default is likely to impose heavy financial costs on the government.

Brazil's temporary interest moratorium (from February 1987 to February 1988) has cost the country from between 710 million US dollars (according to the government; see NZZ of 16.2.88) and 1.5 billion US dollars (according to some Brazilian economists; see International Currency Review, Vol. 19.4). These figures would include higher spreads on short-term trade loans (140 million); the transfer of official reserves to the BIS to avoid seizure (20 million); delayed restructuring of the debt so that Brazil has had to continue paying for higher interest margins over a longer period of time (550 million); support for foreign affiliates of Brazilian banks which had been excluded from interbank business (750 million); and substantial private capital flight as a result of reduced confidence surrounding the moratorium.

Domestic default may generate similar problems. According to a fiscal theory of private portfolio allocation and capital flight (Ize, 1987), the private sector keeps at home the part of its financial wealth on which it expects the government to honor its obligations and sequesters the rest abroad. Loss of reputation due to domestic default would thus impede domestic government finance and stimulate capital flight. The situation may develop in a different way, however, when an old regime collapses and the new regime can credibly commit not to default again. This may apply to the Philippines, but

such cases are exceptional. Another difficulty is that domestic banks are often very important (captive) lenders to their government. Domestic default would severely deplete their capital and would risk to drive them into bankruptcy. As a consequence, the government would be compelled to provide substantial support to the domestic banking system in order to avoid economic chaos, or otherwise it would face the negative consequences for domestic output.

III. Possible remedies

1. How Much Fiscal Discipline is Needed?

How much fiscal discipline is necessary to restore a government's creditworthiness and credibility? Because of changing market perceptions and unstable lending conventions, this question cannot be answered. A more modest approach is to determine the required government budget in order to stabilize debt ratios and to make it consistent with other macroeconomic targets. This has been a concern for OECD Economic Surveys (see, in particular, OECD Economic Survey of Ireland, 1987) and the World Bank (Anand and van Wijnbergen, 1987) alike.

Solving the debt-dynamics equation (2) for the required non-interest surplus to get the debt/income ratio to decline, yields the stability condition

$$[(t-g) + (t^*-g^*)e] > x [(1-f)r + f(r^*+e) - n] - (p+n)m \quad (3)$$

It tells us that more fiscal discipline is required to avoid inflation and rising debt ratios when the demand for base money is low, when GDP growth is low relative to real interest rates, when public debt is high relative to GDP, and when real depreciation raises the real value of net foreign debt. Only when real GDP growth exceeds real interest rates and accumulated debt is low relative to seignorage, can the government run a primary deficit without raising the debt ratio.

Tables 9 and 10 (from Reisen, 1989) provide detailed calculations for the required non-interest surplus in Brazil and Mexico which would be consistent with constant debt ratios, low inflation (5 per cent per year) and real interest rates sufficiently high to make capital flight unprofitable. In

the case of Brazil, the latter requirement would appear to be met for early 1986 when real after-tax returns on treasury bills stood at 14.5 per cent and net errors and omissions in the balance of payments were balanced (Cardoso and Fishlow, 1988). In Mexico, the same conditions seem to have applied in late 1986, when the tax-free real return on treasury bills was 15.4 per cent (Dornbusch, 1988). In the longer term, under condition of sustained fiscal discipline, real domestic interest rates would probably find a lower equilibrium level, as there would be less need to crowd out the private demand for loanable funds and because new government debt could be sold at a lower risk premium. Finally, we require an assumption about the ratio of base money to GDP. The remonetisation of the Brazilian economy after the Cruzado Plan (when inflation was zero) brought the ratio up to 4.4 per cent (from 2.3 per cent in 1985). For Mexico, the 1986 ratio of base money to GDP was very high, at 15.9 per cent in 1981, but has declined continuously, falling to 4.2 per cent in 1987. In the absence of other evidence, it is assumed that with inflation at five per cent and real interest rates at 15.4 per cent, the Mexican ratio of base money to GDP would have been 12 per cent.

(Table 9)

(Table 10)

Further assumptions are that the external positions of both Brazil and Mexico require no further real devaluations of their currencies, that the real effective foreign interest rate is 7 per cent, and that the real GDP growth rates are sustained at 5 per cent in Brazil and 4 per cent in Mexico.

Note, however, that the public debt ratios and end-1987 which underly these results may be viewed by private agents as being too high to inspire confidence in public finances, in which case the required fiscal discipline would be more harsh. Several results deserve to be stressed:

First, a higher non-interest surplus will be required for the Mexican than for the Brazilian government if domestic debt is to be serviced at 1986

interest rates, a further increase of public indebtedness is to be avoided, and inflation is to be constrained at 5 per cent annually. This result is largely -- but not exclusively -- determined by the currently observed public debt ratio, which is approximately equal to GDP in Mexico, but only half as high in Brazil. In 1988, the Mexican authorities seem to have achieved the required fiscal adjustment, while the fiscal disequilibrium in Brazil is estimated at about 3 per cent of GDP. While the Mexican achievement is very impressive, it is too focused on cuts in public investment.

Second, the burden of the domestic public debt will matter more than the burden of foreign debt, provided that further devaluation-induced increases in the real cost of servicing foreign debt can be avoided and that the interest cost of domestic debt continues to exceed the cost of foreign debt.

Third, bringing down inflation from current levels to those observed in stable debtor countries would yield an important once-for-all gain in seignorage, especially in Mexico. If this gain is used to amortize part of the high-cost domestic debt, the required non-interest budget surplus will be reduced.

Debt dynamics continue to impose restrictive fiscal policies on high-debt OECD countries, too (OECD, 1989). Calculations on debt stability requirements, based on a somewhat simpler procedure than that described for Brazil and Mexico, above, show that Belgium, Ireland and Italy still have a fiscal disequilibrium so that debt ratios are currently rising rapidly. The current public borrowing requirements still exceed the level that would stabilize debt ratios, by 3.5 % of GDP in Belgium, 2.0 % in Ireland, and 3.2 % in Italy (OECD, 1989, table 5.23).

2. Growth-Oriented Fiscal Adjustment

If the medium-term strategy is to stabilize (and then to reduce) the public debt ratio, just to run a certain non-interest surplus will not be enough. For such a strategy to be sustainable, GDP growth will have to be fostered and real depreciation of the exchange rate as well as a rise in real

interest rates will have to be minimised. If fiscal adjustment is sought at the cost of lower output growth, it is more likely to be disrupted and less likely to reduce government indebtedness during a longer period.

How can public finance in problem debtor countries contribute to savings, investment, and growth? There are several reasons to focus more on increased tax collection and less on cuts in public spending than is usually done. First, spending cuts have made more strides than increased taxes and cannot reasonably be expected to be reduced further, with the notable exception of Brazil and Argentina. Second, effective tax ratios are relatively low in most debtor countries and there seems scope for non-distorting ways to increase it. Third, low effective tax rates and low import dependence suggest a relatively high income multiplier for government expenditure; spending cuts thus have a considerable negative short-run effect on output.

The menu for tax reform would include the following essentials (World Bank, 1988): keep marginal tax rates low to strengthen incentives to work and save, but raise effective average tax rates. This means: broaden tax bases by eliminating exemptions and special incentives. Choose a tax that is simple and enforceable with little administrative costs and that raises substantial revenues. Such a tax is the Value Added Tax. Successful performers, such as Korea, Indonesia, Chile, and Turkey, all have successfully implemented the Value Added Tax. But there is also room to increase revenues from the personal income tax, especially by eliminating loopholes for top income levels. Raise compliance and enforcement through low tax rates, high penalties on outright avoidance and through abolishing discretionary elements in tax legislation. Introduce effective withholding schemes on wages, dividends and interest and strengthen tax administration to cross-check different tax sources. Stop taxing exports and financial savings.

With raised tax revenues, the composition of public spending could (and should) be shifted back towards investment, away from consumption without reducing its real level. To encourage private investment and to limit devaluation-induced capital losses on foreign debt, the priority for public spending would be on infrastructure, like ports and roads, that favour foreign trade.

3. Debt Management and Debt Reduction

To stabilize total public debt ratios, easy alternatives to fiscal adjustment do not exist. The taxation of domestic bond returns would dampen debt dynamics only if the tax did not raise the bond yields required from the savers (OECD Survey of Ireland, 1988). Under this unlikely condition, governments could increase the tax base by the amount of public interest outlays on domestic debt. But if there is perfect foresight and if assets are perfect substitutes, taxing interest payments has no effect on budget deficits. Changes in tax rates on any assets bring about an equal change in their equilibrium returns and hence leave after-tax yields unaltered (Giovanni, 1988). Italy, however, may have succeeded in dampening the rise in bond yields with a total tax exemption of interest on public securities, allied to the withholding tax on near substitutes of treasury bills like bank deposits (Spaventa, 1988). The process of directing savings towards government debt was helped by initially high financial savings in Italy and the decline in the relative price of real estate.

Export credits and World Bank lending are and will be the major source of foreign finance to heavily indebted countries. This will increase the risk exposure of debtor countries to swings among the dollar, the yen and other key currencies. To hedge against these foreign exchange risks, countries should borrow in currencies in which they run a trade surplus (Black, 1976). This reverses the typical practice of trade finance and is not consistent with the World Bank currency pool either. Rather than using currency swaps to undiversify its lending into hard currency, the Bank should use the swaps to diversify its original currency structure in accordance with the cash flows of the given developing country, at least within the limits set by the Bank's credit status on world financial markets.

The World Bank's new debt report stresses the importance of voluntary debt-reductions. D'accord, under one important condition: foreign debt reduction has to go along with the reduction of total government debt. With domestic bond yields largely exceeding the effective cost of foreign debt, the outcome can be different. Debt-equity swaps, for example, are usually financed by the debtor government (or the central bank). If this finance does not come from printing new money, and if the swap does not increase tax collections, the government has to issue new domestic debt. Reduced foreign

debt, translated into local currency through the real exchange rate, will then be offset by increased domestic debt, corrected for the redemption discount, rd. Hence, the government budget is likely to benefit from a debt equity swap only if

$$r(1-rd)b < r^*b^*e.$$

With domestic bond yields, say, 15 % higher than the average cost on foreign debt, and with the assumption that real devaluation of the debt-weighted exchange rate is zero, the redemption discount has to exceed 13 % to satisfy the condition. When there is real appreciation, as occurred last year in Mexico, the redemption discount has to be even higher to leave the government budget improved.

REFERENCES

- Alesina, A., "The End of Large Public Debts", in: F. Giavazzi and L. Spaventa (eds), High Public Debt: The Italian Experience, Cambridge, Cambridge University Press, 1988, pp. 34-79.
- Anand, R. and S. van Wijnbergen, "Inflation and the Financing of Government Expenditure in Turkey," forthcoming, *The World Bank Economic Review*, 1989.
- Black, St., "Exchange Policies for Less Developed Countries in a World of Floating Rates", *Essays in International Finance*, No. 119, Princeton University, 1976.
- Buffie, E.F. and A. Sangines Krause, "Economic Policy and Foreign Debt in Mexico," forthcoming in: J. Sachs (ed.), *Developing Country Debt*, National Bureau of Economic Research (NBER), 1989.
- Cardoso, E. and A. Fishlow, "The Macroeconomics of the Brazilian External Debt," forthcoming in: J. Sachs (ed.), *Developing Country Debt*, NBER, 1989.
- Clark, C., "Public Finance and Changes in the Value of Money," Economic Journal, Vol. LV, No. 220, pp. 371-398.
- Dornbusch, R., "Special Exchange Rates for Capital Account Transactions," *The World Bank Economic Review*, Vol. 1, 1986, pp. 3-33.
- , "Mexico: Stabilization, Debt and Growth," *Economic Policy*, Vol. 7, 1988, pp: 233-283.
- Gil Diaz, F., "Some Lessons from Mexico's Tax Reform," in: D. Newbery and N. Stern (eds.), *The Theory of Taxation for Developing Countries*, World Bank, New York: Oxford University Press, 1987, pp. 333-359.
- Giovanni, A., "Capital Controls and Public Finance: The Experience of Italy," in: F. Giavazzi and L. Spaventa, High Public Debt: The Italian Experience, op.cit., pp. 177-211.
- Ize, A., "Fiscal Dominance, Debt, and Exchange Rates," Fiscal Affairs Department, International Monetary Fund, mimeo, August 1987.
- Ize, A. and G. Ortiz, "Fiscal Rigidities, Public Debt, and Capital Flight," *IMF Staff Papers*, Vo. 34.2, 1987, pp. 311-332.
- Keynes, J.M., "A Tract on Monetary Reform," 1923, reprinted in Vol. IV of the *Collected Writings of John Maynard Keynes*, London, MacMillan, 1971.
- Lonaus, H., "How the Bank Finances Its Operations," *Finance and Development*, September 1988, pp. 40-42.

- Mansoor, A., "The Budgetary Impact of Privatization," Fiscal Affairs Department, International Monetary Fund, mimeo, October 1987.
- Nicoletti, G., "A Cross-Country Analysis of Private Consumption, Inflation and the 'Debt Neutrality Hypothesis,'" OECD Economic Studies, No. 11, Autumn 1988, pp. 43-87.
- OECD, Economic Surveys, Belgium, Paris, 1988.
- OECD, Economic Surveys, Ireland, Paris, 1987.
- OECD, Economic Surveys, Italy, Paris, forthcoming, 1989.
- OECD, Economies in Transition, Paris, forthcoming, 1989.
- Pinto, B., "Exchange Rate Unification and Budgetary Policy in Sub-Saharan Africa," World Bank, mimeo, June 1987.
- Reisen, H., "Export Orientation, Public Debt, and Fiscal Rigidities: The Different Performance in Brazil, Korea, and Mexico," Journal of International Economic Integration, Vol. 3(1), 1988, pp. 98-115.
- , "Dollar, Yen and Interdependence: Cost of Different Currency Compositions of Indonesia's Debt 1985-1988," Paris, OECD Development Centre, mimeo, 1988.
- , "Public Developing Country Debt, External Competitiveness, and Required Fiscal Discipline," Princeton Studies in International Finance, Princeton, N.J., Princeton University, forthcoming 1989.
- Reisen, H. and A. van Trotsenburg, "Developing Country Debt: The Budgetary and Transfer Problem," OECD Development Centre Studies, Paris, 1988.
- Reynolds, A., "Some International Comparisons of Supply-Side Tax Policy," Cato Journal, Vol. 5, No. 2, 1985, pp.543-569.
- Spaventa, L., "Introduction: Is There a Public Debt Problem in Italy?," in F. Giavazzi and L. Spaventa, High Public Debt: The Italian Experience, op. cit., pp. 1-24.
- Tanzi, V., "Inflation, Lags in Collection, and the Real Value of Tax Revenue," IMF Staff Papers, Vol. 24.1, 1977, pp. 154-167.
- Tanzi, V. and M.I. Blejer, "Public Debt and Fiscal Policy in Developing Countries," in: K. Arrow and M. Boskin (eds.), Economics of Public Debt, 1987.
- World Bank, World Development Report 1988, Washington, DC, 1988.

Table 1
 Net Public Debt, 1981 and 1987
 as percentages of GDP

	Changes 1981-1986/87			Levels 1986/87		
	Domestic	Foreign	Total	Domestic	Foreign	Total
Brazil	12.2	12.1	24.3	20.5	26.1	46.6
Mexico	28.5	31.1	59.6	40.4	53.4	93.8
Indonesia	--	42.7	42.7	--	53.0	53.0
Korea	1.2	-0.8	0.4	6.1	8.3	14.4
Belgium	21.5	11.1	32.6	92.6	21.3	113.9
Ireland	21.1	19.9	41.0	78.3	51.0	129.3
Italy	32.0	1.1	33.1	74.8	2.0	76.8

Source: Central Bank of Brazil, Brazil Economic Program; Banco de Mexico, Indicadores Economicos; World Bank, Indonesia: Adjustment, Growth and Sustainable Development, Report No. 7222 - IND; IMF, International Financial Statistics (for Korea); OECD, Economic Surveys for Belgium, Ireland, Italy.

Foreign public debt is net of official foreign exchange reserves. Domestic debt is net of money base. For Brazil and Mexico, debt stocks at year-end have been deflated by the consumer price index (1980=100) at the end of each respective year. They have then been divided by real GDP in 1980 prices. Data for Italy are based on new national accounts.

Table 2
Debt Determinants
end-1983 to end-1987

	Primary deficit (- denotes surplus)	Real interest less GDP growth	Real annual devaluation, debt-weighted	Share of foreign in total debt end 1987	Seignorage and inflation tax
Brazil	0.7	2.3	2.0	0.56	1.8
Mexico	-3.9	9.7	6.6	0.57	1.5
Indonesia	1.2	2.1	18.2	0.99	0.7
Korea	0.9	-0.8	5.1	0.58	0.4
Ireland	1.0	2.5	-5.8	0.39	0.8
Italy	3.2	2.5	n.t.	0.02	1.8

Source: See Table 1.

The primary deficit in Brazil excludes interest payments for foreign public debt from the operational public sector borrowing requirement. In all other cases, it excludes all interest payments from the nominal public deficit.

Real interest is the weighted average of the real domestic and foreign interest rate on public debt. For Brazil and Mexico, only foreign interest have been considered.

Real annual devaluation is based on effective exchange rates (geometric averages based on moving currency weights), adjusted for domestic inflation.

Seignorage and inflation tax are defined as changes in the inflation-adjusted money tax times the annual rate of inflation, as a percentage of GDP in 1980 prices.

Table 3
Taxes and Domestic Transfers
as percentages of GDP

	1981			1986/87		
	<u>Taxes</u>	<u>Transfers</u>	<u>Net</u>	<u>Taxes</u>	<u>Transfers</u>	<u>Net</u>
Brazil	23.6	10.8	12.8	21.8	9.3	12.5
Mexico (non-oil)	10.6	2.9	7.7	10.5	2.0	9.5
Indonesia (non-oil)	5.9	2.2	3.7	8.1	1.0	7.1
Korea	18.2	3.1	15.1	18.2	2.9	15.3
Belgium	42.8			45.2		
Ireland	38.8			44.3		
Italy	32.9			38.9		
OECD average	35.7			36.0		

Sources: W. Easterly (1989); World Report No. 7222 - IND for Indonesia; OECD (1989) for OECD countries.

Table 4
Personal Income Taxes: Top Rates and Fiscal Yield

	Maximum Individual Tax Rates ^a		Threshold Income Ratio 1987 ^b	Fiscal Revenue ^c	
	1980	1987		1980	latest
Argentina	45 (73.7)	45 (62.3)	26	0.0	0.0
Brazil	55 (76.4)	50 (15.6)	7	0.2	0.2
Mexico	55 (65.8)	60 (46.4)	27	2.4	2.0
Indonesia	50 (15.4)	35 (50.0)	86	0.4	0.7
Korea	89 (173.2)	55 (73.0)	25	2.0	2.4
Belgium	n.t.	67 (140.4)	10	14.1	14.3
Ireland	n.t.	58 (22.3)	3	10.9	13.1
Italy	n.t.	62 (462.9)	35	7.5	11.4

Source: Coopers and Lybrand, 1988 International Tax Summaries; IMF, International Financial Statistics

a Tax rates (percentages) and associated taxable income (in thousands of US dollars). Exchange rates used are period averages.

b Income tax at which the top rate applies divided by per capita GDP.

c Fiscal revenues from personal income tax as a percentage of GDP.

Table 5
The Clark Hypothesis Revisited

	Year	Tax Ratio		Inflation in % p.a.	Multiple of Inflation Compared to Year When Tax Ratio Peaked		
		Highest	Lowest		Year 1	Year 2	Year 3
Argentina	1980	23.3		101	1.5	2.4	4.9
	1984		18.2	627			
	1986	22.0		90	1.5	--	--
Brazil	1982	25.1		98	1.7	2.0	2.4
	1984		21.8	197			
Mexico (non-oil)	1986	21.4		86	1.5	--	--
	1983		18.7	102			
Chile	1985	43.5		31	0.6	0.6	--
	1981		38.2	20			--
Columbia	1980	27.3		27	1.0	0.9	0.8
Indonesia (non-oil)	1986	10.1		6	1.5	--	--
	1984		6.2	10			
Korea	1983	19.0		3	0.7	0.7	0.8
	1982		18.2	7			

Sources: W. Easterly (1989); IMF, International Financial Statistics; World Bank, Report No. 7222-IND.

Table 6
Structure of Public Spending
as percentages of GDP

	<u>1981</u>				<u>1986/87</u>			
	<u>Total</u>	<u>Capital</u>	<u>Interest</u>	<u>Rest</u>	<u>Total</u>	<u>Capital</u>	<u>Interest</u>	<u>Rest</u>
Brazil	n.a.	7.6	10.9	8.8	n.a.	5.4	11.3	12.7
Mexico	39.7	12.9	5.0	21.8	44.2	5.5	19.5	19.2
Indonesia	14.6	6.4	0.7	7.3	21.1	8.4	3.3	9.4
Korea	31.0	10.9	1.4	18.5	25.7	9.0	1.3	14.4
Belgium	57.3	5.0	7.9	44.4	54.0	2.8	11.1	40.1
Ireland	46.0	15.2	7.6	23.2	54.4	9.6	11.3	23.5
Italy	43.5	5.9	3.4	34.2	52.5	5.2	8.7	38.6
OECD avg	39.3	3.5	2.5	33.3	40.2	3.1	3.8	34.3

Source: See Table 1. For OECD average, see OECD (1989), ch. 5.

Table 7

**Capital Formation, Private Savings, and Fiscal Deficits
as percentage of GDP**

	Gross Fixed Capital Formation		Current Account Surplus		Fiscal Deficit (-)		Private Savings		Fiscal Deficit as % of Private Savings	
	1981	1987	1981	1987	1981	1987	1981	1987	1981	1987
Brazil (nominal)	20.3	19.6	-6.0	0.5	-15.8	-29.5	30.0	49.7	52.5	59.4
(operational)					-6.6	-5.5	20.9	25.7	31.6	21.4
Mexico (nominal)	25.7	15.3	-5.8	3.1	-13.6	-15.8	33.5	34.2	40.6	46.2
(operational)					-8.8	-1.2	28.7	19.6	30.7	6.1
Indonesia	29.8	26.2	-0.6	-5.2	-1.4	-2.7	30.6	23.8	4.5	11.5
Korea	27.5	30.7	-6.7	8.1	-3.4	-1.3	24.1	40.1	14.0	3.2
Belgium	17.6	15.5	4.2	2.6	-12.2	-10.1	34.1	28.2	35.9	35.7
Ireland	29.5	17.4	-37.2	3.0	-15.7	-9.1	8.0	29.5	197.0	30.9
Italy	23.9	19.9	-2.4	-0.1	-11.4	-11.6	32.9	31.3	34.6	37.0

Source: See Table 1; IMF; International Financial Statistics

Domestic private savings have been calculated as the residual of gross capital formation plus public borrowing requirement plus current account balance.

Table 8
Money Base and Domestic Public Debt
as percentages of GDP

	Real Money Base		Real Money Base as % of Domestic Public Debt	
	1981	1987	1981	1987
Brazil	3.5	2.2	42	11
Mexico	15.9	4.5	134	11
Indonesia	7.1	8.0	n.t.	n.t.
Korea	5.7	7.4	116	121
Belgium	10.3	7.8	14	11
Ireland	11.0	10.0	19	13
Italy	15.0	15.5	35	21

Source: Table 1; IMF, International Financial Statistics

Money bases at year-end have been deflated by the consumer price index (1980 = 100) at the end of each respective year and then been divided by real GDP in 1980 prices.

Table 9

Brazil: Required public sector non-interest surplus

	<u>1983</u>	<u>1984-87</u>	<u>From 1988</u>
<u>Required non-interest surplus as percentage of GDP (=)</u>	<u>7.5</u>	<u>2.0</u>	<u>2.1</u>
Real interest bill on domestic debt (+)	1.8	2.3	3.0
Real interest bill on foreign debt (+)	1.5	2.4	1.8
Monetary finance (-)	0.1	0.5	0.4
New domestic borrowing consistent with constant debt ratio (-)	-0.3	1.0	1.0
New foreign borrowing consistent with constant debt ratio (-)	-4.0	1.2	1.3
Memo: <u>actual</u> non-interest balance (negative sign denotes deficit)	-0.9	-0.4	-1.0 ^a
<u>Assumptions</u>			
Ratio of money base to GDP	4.4	4.4	4.4
Annual inflation rate	5.0	5.0	5.0
Real interest rate on domestic debt (net of taxes)	14.5	14.5	14.5
<u>Observations^b</u>			
Real annual GDP growth	-2.5	6.3	5.0
Real annual devaluation	24.0	2.0	0.0
Real interest rate on foreign debt	10.1	8.6	7.0

Source: Central Bank of Brazil, Brazil Economic Program; Morgan Guaranty, World Financial Markets; IMF, International Financial Statistics.

- 1) Foreign public debt is net of official foreign exchange reserves. Domestic non-monetary debt is net of government assets and money base. Debt stocks and money base at year-end have been deflated by the consumer price index (1980 = 100) at the end of each respective year. Annual changes in real debt and the real money base thus obtained have then been divided by real GDP in 1980 prices.

- 2) The operational public sector borrowing requirement excludes the Monetary Authority, and (pre-Cruzado Plan) deducts the monetary and exchange correction paid on the domestic debt.
- 3) The primary deficit excludes interest payments for foreign public debt from the operational public sector borrowing requirement.
- 4) A decline in the exchange-rate index denotes real devaluation.

a Refers to January-March 1988

b Data from 1988 are based on assumptions. Real interest rate on foreign debt refers to the effective rate net of inflation in the US consumer price index.

Table 10

Mexico: Required public sector non-interest surplus

	<u>1982-83</u>	<u>1984-87</u>	<u>From 1988</u>
<u>Required non-interest surplus as percentage of GDP (=)</u>	<u>10.6</u>	<u>10.1</u>	<u>5.1</u>
Real interest bill on domestic debt (+)	1.8	3.2	6.2
Real interest bill on foreign debt (+)	1.9	3.7	3.7
Monetary finance (-)	0.3	0.5	1.1
New domestic borrowing consistent with constant debt ratio (-)	-0.3	-0.2	1.6
New foreign borrowing consistent with constant debt ratio (-)	-6.9	3.4	2.1
Memo: <u>actual</u> non-interest balance (negative sign denotes deficit)	-0.9	4.1	6.9 ^a
<u>Assumptions</u>			
Ratio of money base to GDP	12.0	12.0	12.0
Annual inflation rate	5.0	5.0	5.0
Real interest rate on domestic debt	15.4	15.4	15.4
<u>Observations^b</u>			
Real annual GDP growth	-2.9	-1.2	4.0
Real annual devaluation	31.4	6.6	0.0
Real interest rate on foreign debt	9.7	8.5	7.0

Source: Banco de Mexico, Indicadores Economicos; Morgan Guaranty, World Financial Markets; IMF, International Financial Statistics; Dornbusch (1988).

- 1) Foreign public debt is from Dornbusch (1988); official foreign exchange reserves have been netted out. Domestic non-monetary debt is the sum of net claims of the financial sector on the central government and non-financial public enterprises plus government bonds directly sold to the private sector minus the money base. Debt stocks and money base at year-end have been deflated by the consumer price index (1980 = 100) at the end of each respective year. Annual changes in real debt and the real money base thus obtained have then been divided by real GDP in 1980 prices.

- 2) The operational public sector borrowing requirement is defined as financial deficit minus monetary correction on domestic debt.
- 3) The primary deficit is defined as the financial deficit minus interest payments on domestic and foreign public debt.
- 4) A decline in the exchange-rate index denotes real devaluation.

a Refers to April-June 1988.

b Data from 1988 are based on assumptions. Real interest rate on foreign debt refers to the effective rate net of inflation in the US consumer price index.

PPR Working Paper Series

<u>Title</u>	<u>Author</u>	<u>Date</u>	<u>Contact for paper</u>
WPS240 The Public Role in Private Post-Secondary Education: A Review of Issues and Options	Ake Blomqvist Emmanuel Jimenez	August 1989	A. Bhalla 61059
WPS241 The Effect of Job Training on Peruvian Women's Employment and Wages	Ana-Maria Arriagada	July 1989	C. Cristobal 33640
WPS242 A Multi-Level Model of School Effectiveness in a Developing Country	Marlaine Lockheed Nicholas Longford		
WPS243 Averting Financial Crisis - Kuwait	Fawzi Hamad Al-Sultan		
WPS244 Do Caribbean Exporters Pay Higher Freight Costs?	Alexander Yeats	July 1989	J. Epps 33710
WPS245 Developing a Partnership of Indigenous Peoples, Conservationists, and Land Use Planners in Latin America	Peter Poole	August 1989	S. Davis 38622
WPS246 Causes of Adult Deaths in Developing Countries: A Review of Data and Methods	Richard Hayes Thierry Mertens Geraldine Lockett Laura Rodrigues	July 1989	S. Ainsworth 31091
WPS247 Macroeconomic Policies for Structural Adjustment	Carlos A. Rodriguez		
WPS248 Private Investment, Government Policy and Foreign Capital in Zimbabwe	Mansoor Dailami Michael Walton	August 1989	M. Raggambi 61696
WPS249 The Determinants of Hospital Costs: An Analysis of Ethiopia	Ricardo Bitran-Dicowsky David W. Dunlop		
WPS250 The Baker Plan: Progress, Shortcomings, and Future Evolution	William R. Cline	August 1989	S. King-Watson 33730
WPS251 Patents, Appropriate Technology, and North-South Trade	Ishac Diwan Dani Rodrik		
WPS252 Do the Secondary Markets Believe in Life After Debt	Vassilis A. Hajivassiliou	August 1989	S. King-Watson 33730

PPR Working Paper Series

	<u>Title</u>	<u>Author</u>	<u>Date</u>	<u>Contact for paper</u>
WPS253	Public Debt, North and South	Helmut Reisen	August 1989	S. King-Watson 33730
WPS254	Future Financing Needs of the Highly Indebted Countries	Ishrat Husain Saumya Mitra	August 1989	S. King-Watson 33730
WPS255	The External Debt Difficulties of Low Income Africa	Charles Humphreys John Underwood	August 1989	S. King-Watson 33730
WPS256	Cash Debt Buybacks and the Insurance Value of Reserves	Sweder van Wijnbergen		
WPS257	Growth, External Debt , and the Real Exchange Rate in Mexico	Sweder van Wijnbergen		
WPS258	The Role of Voluntary Organizations in Developmen	L. David Brown David C. Korten		
WPS259	Dealing with Debt: The 1930s and the 1980s	Barry Eichengreen Richard Portes	August 1989	S. King-Watson 33730
WPS260	Growth, Debt Accumulation and Sovereign Risk in a Small, Open Economy	Jagdeep S. Bhandari Nadeem Ul Haque Stephen J. Turnovsky		
WPS261	Inflation, External Debt and Financial Sector Reform: A Quantitative Approach to Consistent Fiscal Policy	Sweder van Wijnbergen Roberto Rocha Ritu Anand		
WPS262	Economic Policy and External Shocks in a Sinal Open Economy: the Irish Experience	F. Desmond McCarthy		Dermot McAleese
WPS263	How Has Instability in World Markets Affected Agricultural Export Producers in Developing Countries?	Peter Hazell Mauricio Jaramillo Amy Williamsen	August 1989	C. Spooner 30464
WPS264	Case Studies of Two Irrigation Systems in Colombia: Their Performance and Transfer of Management to Users' Associations	Herve Plusquellec		
WPS265	The Influence of Imperfect Competition in International Markets: Some Empirical Evidence	Alexander Yeats		