

PRINCETON STUDIES IN INTERNATIONAL FINANCE

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PUBLIC DEBT, EXTERNAL COMPETITIVENESS,  
AND FISCAL DISCIPLINE IN DEVELOPING COUNTRIES

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## 1 INTRODUCTION

Macroeconomic-stabilization and structural-adjustment programs for debt-ridden developing countries generally center on two major policies: reduction of the fiscal deficit as the expenditure-reducing policy and devaluation of the domestic currency as the expenditure-switching policy. This study discusses and quantifies the conditions under which those policies are consistent for countries such as Brazil and Mexico, which have large public debts denominated in foreign currency.

Although the fiscal impact of a change in the exchange rate has received little attention in economic analysis, it has fostered a wide array of opinions. Krueger (1978, pp. 130-131) reports ambiguous and weak evidence on the automatic response of the government budget to a devaluation. Ize and Ortiz (1987) argue that the impact is positive when the exchange rate overshoots. Dornbusch (1987) and Sachs (1987) assume that it is negative.

The political and economic implications of this question are too important to leave it unsettled. If there is an important tradeoff between large devaluations and fiscal balance, debtor countries face a difficult policy choice. A real depreciation of the domestic currency would improve the current account in the balance of payments, but it would widen the budget deficit and hence stimulate the government's recourse to domestic borrowing and inflationary finance, eroding the debtor's international creditworthiness. It is thus necessary to know the tradeoff in order to determine the desirable balance between external financing (or debt relief) and current-account adjustment.

The remaining chapters of this study are organized as follows. Chapter 2 examines the role of fiscal rigidities in explaining recurrent problems of heavily indebted developing countries, such as high inflation, financial disintermediation, and depressed investment. The analysis is based on a stylized account of events in debtor countries since the cutoff of foreign lending; it draws heavily on a recent OECD Development Centre Study (Reisen and van Trotsenburg, 1988). Chapter 3 develops a formal framework for tracing the fiscal impact of a change in the real exchange rate, based on the simple budget identity. It shows that the automatic response of the budget to a depreciation of the real exchange rate depends on tax-base and spending

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characteristics, the level and ownership of the public debt, the net flow of foreign exchange to or from the government, and the effective interest rate on foreign debt. It concludes that the net fiscal impact is likely to be adverse in the short to medium term. Chapter 4 computes the amount of fiscal discipline that would have been necessary for Brazil and Mexico from 1982 through 1987 in order to reconcile the large depreciations of their real exchange rates consistent with low inflation and covered interest parity. The same exercise is then conducted with data for the end of 1987 to measure the fiscal discipline required if foreign finance remains rationed and default on domestic and foreign debt is to be avoided. It appears that the recent increase in domestic public debt is likely to impose a heavier financial burden on those countries than the main origin of that increase—the servicing of foreign debt.

## 2 FISCAL RIGIDITIES AND RECURRENT DEBT PROBLEMS

It is well understood that heavily indebted countries have to generate a trade surplus to service foreign debt as long as their international creditworthiness has not been restored. The debt-export ratio, often used as an indicator of creditworthiness, cannot improve (i.e. fall) unless the noninterest current-account surplus, expressed as a fraction of exports, exceeds the difference between the effective interest rate on foreign debt and the growth rate of export revenues (Dornbusch, 1985). In explaining and projecting the debt-export ratio, the sizable literature on developing-country debt has emphasized external parameters such as the growth rate of OECD countries, world interest rates, and trends in international prices. This approach, however, does not adequately explain the recurrent debt problems of heavily indebted countries, including the persistence of their budget deficits, three-digit inflation rates, depressed domestic savings and investment, abnormally high domestic interest rates, and repeated attacks on their currencies and foreign-exchange reserves. The problem of servicing debt is seriously complicated by the fact that much of the foreign debt is owed by the public sector, whereas most of the countries' export earnings and an important part of their foreign assets are owned by the private sector (Sjaastad, 1983). Hence, governments are forced to raise from the private sector the resources required for debt service by measures that tend to depress private savings, exports, and growth, instead of pursuing policies that promote them.

Consequently, persistent debt problems can often be explained most cogently by applying a fiscal approach rather than a monetary or a foreign-trade approach (see Table 1). This approach focuses the government's budget identity, and it is developed more formally in Chapter 3. The budget identity links the shortfall of foreign financing with the principal forms of domestic financing. The shortfall of foreign financing is the difference between interest payments on net foreign public debt (gross debt *minus* foreign assets) and net new foreign borrowing. The forms of domestic financing are tax revenues, the net increase in domestic nonmonetary public debt, and the increase in real base money *less* the government's noninterest outlays and interest payments on domestic public debt. Usually, the budget identity is grouped to show the link between the public-sector borrowing requirement (fiscal deficit) and sources of external and internal financing. The grouping used here makes immediately apparent the link between the *external transfer* of foreign exchange from the debtor country's government

TABLE 1  
THE FISCAL AND FINANCIAL SITUATION  
OF DIFFERENT DEBTOR GROUPS

	Period	Problem Debtors <sup>a</sup>	Stable Debtors <sup>b</sup>
Change in real public revenue as a percentage of 1980-82 average level	1982-86	-21.9	15.4
Consolidated nominal public-sector borrowing requirement as a percentage of GDP	1982-86	13.8	2.4
Monetary public financing as a percentage of GDP <sup>c</sup>	1982-86	4.2	1.1
Average annual percentage increase of consumer prices	1982-86	99	5
Gross capital formation as a percentage of GDP	1983-86	18	24
Nonbank deposits held abroad as a percentage of private deposits in domestic banking system <sup>d</sup>	1983-86	39	2
Memo: Annual growth rate of real GDP	1982-86	0.9	5.2

SOURCES: Banco de Mexico, *Indicadores Economicos*, various issues; Bank for International Settlements, *International Banking Developments*; Central Bank of Brazil, *BRAZIL Economic Program*; Fundacion de Investigaciones para el Desarrollo (Argentina), *Coyuntura y desarrollo*; International Monetary Fund, *International Financial Statistics*.

<sup>a</sup> Argentina, Brazil, Chile, Mexico, Nigeria, Philippines, Venezuela; for consolidated public-sector borrowing requirements, Argentina, Brazil, and Mexico.

<sup>b</sup> Algeria, Indonesia, Malaysia, South Korea, Thailand; for consolidated public-sector borrowing requirements, South Korea.

<sup>c</sup> Real base money at 1980 prices times the annual inflation rate, expressed as a percentage of GDP at 1980 prices.

<sup>d</sup> Defined as gross liabilities of commercial banks in BIS-reporting countries to the nonbank sectors of debtor countries, expressed as a percentage of domestic demand, time, and savings deposits of the private sector (local-currency amounts converted at end-of-year exchange rates).

to foreign creditors and the *internal transfer* of resources from the private to the public sector. It is therefore important to use measures of the fiscal deficit and of the budget identity that include the entire public sector. Ideally, they should incorporate all levels of government (national, provincial, local), public enterprises, extra-budgetary entities, and the central bank, which in most developing countries undertakes many quasi-fiscal

activities, most notably the monetary financing of fiscal deficits (Robinson and Stella, 1987). Unfortunately, the data available on an internationally comparable basis (as in the *Government Finance Statistics Yearbook* of the International Monetary Fund) relate mainly to the central government. Indeed, the poor quality of the published public-finance data has obscured the fiscal underpinnings of debt problems (and the reasons for the poor enforcement of IMF conditionality).

Fiscal rigidities explain why the important shift in net external transfers that occurred with the onset of the debt crisis was immediately translated into exploding fiscal deficits, often larger than 15 percent of GDP. Cuts in public spending figured importantly in efforts to limit those deficits, but they were not up to the task and were not "growth oriented," since they often concentrated on capital expenditure. To the extent that they hit investments in infrastructure rather than "white elephants," they lowered the productivity of complementary private-sector investment, reducing its profitability and future output growth. Cuts in current outlays such as subsidies and public-sector salaries were limited because they were likely to meet opposition from well-organized lobbies or to produce social unrest. Closures and privatizations of unprofitable public enterprises occurred in many cases, some in the context of debt-for-equity swaps, but they do not always solve the budgetary problem. Sales of loss-making enterprises unlikely to become more efficient under private ownership involve subsidies equivalent in present-value terms to the future stream of losses. Sales of profitable enterprises impose losses on the government unless it is able to charge a price equal to the present value of the future earnings stream (Mansoor, 1987).

Fiscal rigidities were even more pronounced on the revenue side. Tax ratios of developing countries tend to be much lower than those of industrial countries, less than half as large on average, but there has been no instance in which a developing country has been able to raise the ratio several percentage points of GDP over the medium term, as has happened in some developed countries (Tanzi and Blejer, 1986). And though tax ratios are low, tax rates themselves are equal to or higher than the international standard (Reynolds, 1985). This suggests that failure to broaden the tax base is crucial in explaining the persistent debt-servicing problems of many developing countries. Administrative and technical defects in tax assessment and collection prevent tax revenues from rising, and powerful interest groups have often prevented tax-legislation reforms aimed at abolishing tax holidays and exemptions.<sup>1</sup> The local elite is also blamed for the Latin American objection

<sup>1</sup> This became particularly apparent in Brazil in late 1987, when the Finance Minister resigned after an unsuccessful attempt to implement 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 prevented the elimination of tax shelters for truckers, farmers,

to tax treaties, which would prevent the tax-free ownership of foreign assets (Lessard and Williamson, 1987).

Tax revenues have been low in debtor countries not only because of the lack of political commitment to tax reform but also because they have been depressed by the debt crisis itself. Reductions in consumption, profits, wages, per capita incomes, and imports, mostly unavoidable if overall demand is to be restrained effectively, have shrunk tax bases. Moreover, the Tanzi effect—the adverse effect of accelerating inflation on real tax revenues—showed up in debtor countries. Tax collections do not keep pace with inflation because progressive income taxes produce only a small share of total tax revenue and many other taxes are levied at specific rates, with long lags in collection (Tanzi, 1977). The lags between accruals and payments reflect the fact that penalties for lateness are low or not enforced. A broad gamut of tax exemptions also hold down revenues.

The budget deficits resulting from these fiscal rigidities had to be covered in large part by domestic borrowing and printing money. A noninterest budget surplus would have been required to constrain inflation; its size can be shown to depend on the demand for real base money, the difference between the real interest rate and the growth rate of GDP, and the level of the public debt (see Chapter 3). Instead, many debtor countries ran budget deficits, even net of interest payments, throughout 1982-88, and though these were financed in part by sales of domestic bonds in the domestic market—a strategy followed extensively by Brazil and Mexico—inflation could not be contained, for reasons ignored by simple monetarist models. Because potential bond buyers attached a high default risk to government bonds, they were reluctant to buy them. The low demand for domestic bonds, coupled with imperfect capital mobility, drove real interest rates far above the world level in many debtor countries. As real interest rates exceeded real growth rates, they compounded the effect of noninterest budget deficits, driving up the ratio of domestic public debt to GDP. Eventually, the deficits had to be monetized, because domestic debt-to-output ratios could not be raised further, confirming the theoretical result obtained by Sargent and Wallace (1981).

Sooner or later, money creation played an important role in virtually every debtor country seeking to make the internal resource transfer needed to service external debt. Base money is an interest-free liability of the public sector which can cover its real spending to the extent that the private sector holds domestic currency and the domestic banking system holds reserves

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publishers, and other groups, sectors to which profits are easily shifted for purposes of tax evasion. In Argentina, the cigarette tax alone collects 25 percent more revenue than the profits, capital, and net-asset taxes combined. A mere 4.8 percent of the companies listed on the gains-tax roll paid any tax at all in 1986 (*The Review of the River Plate*, Nov. 27, 1987).

with the central bank against its deposit liabilities. In developing countries, minimum-reserve requirements on demand and savings deposits are important in providing the government with direct access to bank credit (McKinnon and Mathieson, 1981). If this source of seignorage does not give the government enough resources at a stable price level, because the demand for real base money does not grow rapidly enough, inflation develops and interacts with the reserve requirements to impose an inflation tax that gives the government more revenue (Cagan, 1956; Phelps, 1973). The process is called an inflation tax, because the inflation rate can be regarded as a tax rate and the demand for real base money can be regarded as a tax base.

There is almost no empirical evidence on the ultimate incidence of the inflation tax in debtor countries. The inflation tax on currency, however, can be expected to hit the poor in the informal sectors, because they find it more difficult than do others to switch into foreign currency or assets (for evidence on Mexico, see Gil Diaz, 1987). The burden of the inflation tax on the reserve component of base money is presumably shared by depositors, whose yields are driven down, and nonpreferential borrowers, whose borrowing costs are driven up. The reserve requirement on time deposits drives a wedge between the market-clearing interest rates on deposits and loans, its size being positively associated with the inflation rate. Ceilings on deposit and loan rates then determine how the inflation tax is divided between savers and borrowers (McKinnon and Mathieson, 1981).

When tax burdens rise, the incentives for tax avoidance and evasion are strengthened. This result applies to the inflation tax, too. In some debtor countries, there has been a tripling in the velocity of base money (the inverse of the ratio of base money to GDP) compared with pre-crisis levels. The demand for base money fell, limiting the quantity of resources that governments could acquire from the inflation tax. If they pushed the inflation rate higher, they ended up with smaller real resources. This explains why currency reforms were inevitable in Argentina, Brazil, and Bolivia, and it also explains the timing of those reforms. The timing in each country was closely related to reaching or exceeding the maximum yield from the inflation tax.

Inflation has also been used by some governments, notably in Argentina, to quasi-default on their domestic liabilities and hence to reduce the real cost of domestic debt service. However, this way of inflicting "surprise" capital losses on holders of domestic bonds has become increasingly ineffective (Buiter, 1985). Public debt is now of very short-term maturity in debtor countries (generally, no longer than three months), and it is contracted on a floating-rate basis or is fully indexed to inflation. Hence, there is little scope for governments to lower the *ex post* real return on domestic debt by raising

the inflation rate unexpectedly. Indeed, bondholders have taken high and rising inflation rates into account by requiring correspondingly higher nominal interest rates on domestic government debt. Finally, in many debtor countries a reduction in the real domestic public debt obtained by generating inflation cannot prevent the further growth of interest-bearing debt, because tax revenues and monetary financing will still fall short of the government's noninterest spending (Spaventa, 1987).

Fiscal rigidities and inflationary public finance have undermined growth-oriented (i.e., investment-led) adjustment and the restoration of confidence on the part of foreign and domestic creditors. When the budget deficit exceeds the current-account deficit, the public sector becomes a net user of household and corporate savings, which are then unavailable for private investment. This explains why private investment is depressed in so many debtor countries. High inflation, high minimum-reserve requirements, and forced sales of government bonds have enlarged the wedge between the interest rate paid to domestic savers and the rate that must be paid by domestic borrowers. Rates received by savers are often too low to mobilize savings for capital formation, while credit costs are too high to finance even profitable investments. The concomitant losses of efficiency and opportunities for growth are frequently exacerbated by the provision of rationed credit to favored (big or public) enterprises at preferentially low interest rates.

High inflation and currency depreciation have diverted private savings into domestic inflation hedges, currency substitution, and foreign assets, producing financial disintermediation and capital flight, as the citizens of debtor countries have sought to acquire assets beyond the reach of their governments. These events have inspired a fiscal theory of private portfolio allocation and capital flight (Ize, 1987) arguing that the private sector keeps at home only that part of its financial wealth on which it expects the government to honor its obligations and sequesters the rest abroad. In countries where fiscal rigidities persist, a larger share of private wealth will be kept abroad because of the risks of imminent default and higher taxation. These risks make it impossible to prevent capital flight merely by maintaining covered interest parity.

### 3 FISCAL EFFECTS OF DEVALUATION

Considering the French situation in the 1920s, when public debt service absorbed almost all tax revenues, Keynes (1923) advocated a discrete devaluation to erode the real value of domestic-currency public debt by inducing a once-for-all increase in the price level. Keynes was concerned with the distributional effects of a growing stock of public debt—the transfer from those who pay taxes to service the debt (workers, entrepreneurs) to those who hold the debt (*rentiers*). There is also an efficiency argument for reducing the real value of the public debt when it crowds out private investment and thus reduces capital formation below the optimal rate (Buiter, 1985). Keynes's recommendation has been revived and modified by several authors (Ize and Ortiz, 1987; Ize, 1987; Trigueros and Fernandez, 1986). They argue that a devaluation or depreciation can reduce real interest rates even when the price level is sticky and the debt is short-term, provided the exchange rate overshoots, creating the expectation of subsequent appreciation. That expectation can drive a wedge between returns on assets in domestic and foreign currencies, and lower returns on domestic assets reduce the costs of servicing domestic debt. On this view, devaluation helps to promote external adjustment and fiscal stability *uno actu*, without an unpleasant tradeoff between them.

The analysis that follows casts serious doubt on the presumption that devaluation reduces the budget deficit. It shows that the automatic fiscal response to devaluation is likely to be negative in the short term for the typical (largely inward-oriented) problem debtor. The rise in tax receipts and new inflow of foreign finance will be too small to make up for the rise in the local-currency costs of servicing foreign-currency debt. To be sure, discretionary policy action (tax reform, debt relief, outright default, etc.) can mitigate or enhance the impact of devaluation. But such policies may not be forthcoming quickly enough or may have too small an impact to compensate for the massive devaluations that have been and often are required by problem debtors.

Consider a country that has lived on capital imports and run up excessive debt. To improve its standing on international capital markets, it must shift resources from the oversized domestic sector to the export and import-competing sectors and thus improve its current account. A sustained devaluation of the real exchange rate is unavoidable. To make it sustainable, we do not adopt the familiar assumption that the price level,  $P$ , adjusts sluggishly toward long-run purchasing-power parity (PPP). Instead, we use an adjust-

ment equation that allows for a longer-lasting real devaluation of the domestic currency.<sup>1</sup>

The real exchange rate,  $e$ , is defined as the world price level,  $P^*$ , converted into local currency by the nominal exchange rate,  $E$ , and divided by the home price level,  $P$ :

$$e = EP^*/P. \quad (1)$$

For convenience, define long-run PPP by  $e = 1$ .

With sluggish price adjustment (inertia), the real exchange rate behaves this way:

$$\dot{e}/e = u(1 - \hat{e} - e), \quad u > 0, \quad (2)$$

where dotted variables denote changes and  $\hat{e}$  is the sustainable devaluation of the real rate. In other words, equation (2) says that the real exchange rate adjusts gradually toward a level that differs from long-run PPP by  $\hat{e}$ .

The immediate consequence of a real devaluation is a proportionate rise in real interest payments on foreign-currency debt, but its impact on the noninterest part of the government budget is much more difficult to determine.<sup>2</sup> The budget is likely to be affected by the changes in prices resulting from the devaluation (price effects) and by changes in various tax bases induced by changes in wages, corporate incomes, and export and import volumes (output effects).

A sustained real devaluation raises the prices of tradable goods relative to nontradables. To analyze the price effects, it is therefore useful to break down the noninterest budget deficit,  $D$ , into those taxes and expenditures that depend on the prices of nontradables and those that depend on the prices of tradables. In other words, the government has a deficit or surplus in nontradables ( $G - T$ ) and another in tradables ( $G^* - T^*$ ). Both terms are expressed in home currency, so that the nominal deficit is

<sup>1</sup> The impact of swings in exchange rates between the dollar and other key currencies is not considered here. It depends mainly on the currency compositions of foreign debt and of net exports. A depreciation of the dollar against other key currencies reduces the devaluation of the debtor country's dollar exchange rate required to improve external competitiveness to the extent that other currencies have significant trade weights in the definition of the effective exchange rate. But when the share of the depreciating dollar is smaller in the currency composition of foreign debt than in the debtor country's receipts from net exports, the government is likely to be adversely affected by the dollar depreciation. This holds for Indonesia, which is heavily indebted in yen but earns its foreign-exchange receipts mainly from oil in dollar-denominated world markets.

<sup>2</sup> Since the exchange rate is an endogenous variable in a macroeconomic system influencing and being influenced by other variables, an empirical quantification of the automatic budget response to devaluation really requires a general-equilibrium framework. For an informal discussion, see Seade (1988).

$$D = (G - T) + (G^* - T^*) = (g - t)P + (g^* - t^*)EP^*, \quad (3)$$

where the lower-case letters refer to real amounts expressed in physical units. Corrected for domestic inflation, equation (3) becomes

$$D/P = (g - t) + (g^* - t^*)e. \quad (3')$$

Expenditures on nontradables would include public-sector salaries; expenditures on tradables would include imported capital goods. Taxes falling on nontradables would include taxes on labor, and taxes on tradables would include trade taxes. The government of an outward-oriented economy or with an important publicly owned mineral sector is more likely to have a surplus in tradables or be a net seller of foreign exchange to the private sector than the government of an inward-oriented economy or without export-oriented public enterprises. In an inward-oriented country, a devaluation will reduce the dollar value of total tax receipts because they derive largely from taxes on nontradables, while the reduced dollar value of spending on nontradables will not fully offset the cut in tax receipts.

Consider now the budget identity that links the government's noninterest deficit *plus* nominal interest payments on internal and external debt to the sources of financing:

$$D + iB + i^*(B^* - F^*) = \dot{B} + \dot{B}^* - \dot{F}^* + \dot{M}, \quad (4)$$

where  $i$  and  $i^*$  are the nominal interest rates on local-currency and foreign-currency debts,  $B$  is domestic-currency public debt held outside the central bank,  $B^*$  is foreign-currency public debt,  $F^*$  is the stock of foreign assets held by the public sector (including the central bank), and  $M$  is base money.

The conventional cash definition of the fiscal deficit given by this last equation does not correctly reflect the fiscal adjustment that the government must make, nor does it adequately measure the government's claims on real resources. Since inflation acts as a capital levy on outstanding debt, nominal interest payments include an inflation premium that compensates bondholders for inflation (Barro, 1984, pp. 373-384). In addition, the concern here is with the fiscal impact of a sustained real devaluation. These considerations are recognized by substituting real for nominal interest rates in the previous equation and by correcting all other terms of the budget identity for domestic inflation:

$$\begin{aligned} & (g - t) + (g^* - t^*)e + rb + r^*(b^* - f^*)e \\ & = \dot{b} + \dot{b}^*e - \dot{f}^*e + \dot{m}, \end{aligned} \quad (5)$$

where  $r$  and  $r^*$  are the real interest rates on local-currency and foreign-currency debts and where  $b = B/P$ ,  $b^* = B^*/EP^*$ ,  $f^* = F^*/EP^*$ , and  $m = M/P$ .