

Export Orientation, Public Debt, and Fiscal Rigidities : The Different Performance in Brazil, Korea, and Mexico

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This paper tries to explore why debt problems persist in Brazil and Mexico, but not in Korea. It will discriminate among the many alternative hypotheses about the contrasting performances of Latin American versus East Asian debtor countries. This identifies a) past trade strategies, b) public debt levels, and c) fiscal rigidities to explain better than other determinants why Brazil's and Mexico's record is so poor compared with Korea's. Particular emphasis is given to the interaction of external competitiveness and fiscal retrenchment by discussing the impact of the foreign exchange rate on the public budget equation.

I. Where and Why does Performance Differ?

Since fall 1982, Mexico and, somewhat later, Brazil have suffered adverse departures from long-term trends with respect to international creditworthiness, real GDP growth, domestic saving and investment levels, as well as inflation. Korea did not share this bad experience. Its foreign liabilities are valued—and regularly serviced—at face value, while on the growing secondary markets for developing-country debt there are important discounts in the case of Brazil and Mexico. Unlike both these countries, Korea has not been forced to reschedule its foreign debt.

Why Brazil and Mexico fell victim to the external debt problem and Korea did not, has found a more convincing answer than why debt problems persist in the two

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Latin American mega-debtor countries¹. External factors such as OECD growth, dollar interest rates, terms of trade and OECD protectionism cannot explain the differences in economic performance up to 1985. OECD growth translates quite evenly into foreign export demand, the US being the most important single market and the OECD absorbing about the same share of total exports for all three countries. Nor did the foreign interest rate, defined as the ratio of actual interest payments to disbursed foreign debt, greatly differ among the three debtors. The 'terms-of-trade effect', the percentage change in the ratio of export prices to import prices times the import share of GDP, has hit the three countries very differently but is not importantly tied to macroeconomic performance as a cause. Throughout 1979-85, it was negative for Brazil, not exceeding two per cent of GDP however. It was negative during 1979-82 in Korea and positive thereafter, but again did not account for more than two per cent of domestic product. The terms-of-trade effect has been important only for Mexico, but rather explains the 'misjudgment problem' as Corden has called it² than events up to the Mexican debt crisis in 1982 because it was positive until then. Mexico, on the other hand, seems to be less exposed to protectionist measures by the OECD than Korea and Brazil, both of which face considerable, but not substantially different, OECD tariffs and restrictions on their manufactured exports.³

Since external factors fail to account for any great portion of the three countries' different macroeconomic record up to 1982, the explanation must be sought in domestic factors. Several hypotheses stressing domestic policies are at variance with empirical evidence, however. Supply-siders relate economic performance to the microeconomic details of tax structures, in particular to marginal tax rates and the real income level to which the rates apply.⁴ Such a hypothesis, of course, cannot be rejected by comparing

1. For a careful empirical dissection (covering data up to 1983) of the macroeconomic performance in major Latin American and East Asian debtor countries, see Jeffrey D. Sachs, "External Debt and Macroeconomic Performance in Latin America and East Asia", *Brookings Papers on Economic Activity*, 2: 1985, pp. 523-564. Sachs concludes that the most important differences between both regions center on exchange rate management and the trade regime.

2. W. Max Corden, *Inflation, Exchange Rates and the World Economy*, Clarendon Press, Oxford 1977, pp. 43-51.

3. S.J. Anjaria, N. Kirmani and A.B. Petersen, Trade Policy Issues and Developments, *IMF Occasional Paper No. 38*, Washington, D. C., 1985, pp. 72-82 and Tables 72-76.

4. Alan Reynolds, "Some International Comparisons of Supply-Side Tax Policy", *Cato Journal*, Vol. 5, No. 2 (Fall 1985). pp. 543-569.

tax ratios (which are quite similar for the three countries), as Sachs does.⁵ But nor is the supply-side tax argument confirmed by marginal tax rates which have been among the highest in Korea on personal income and are equal on corporate income. Heavy government interference, another favoured hypothesis to explain diverging performance between the major debtor countries,⁶ does also prevail in Korea.⁷ It has allocated a share of national fixed capital formation through state enterprise which is only little below that of oil-extracting Mexico's and slightly higher than Brazil's. Korea has relied on government-directed financing for channeling resources to priority sectors, spent high subsidies to

Table 1. Divergent Debt and Performance Indicators up to 1982

| | Period (avg.) | Brazil | Korea | Mexico |
|---|---------------|--------|-------|--------|
| 1. Manufactured exports (a) (as % of GDP) | 1980-82 | 3.0 | 30.0 | 1.3 |
| 2. Foreign debt over exports (b) | 1982 | 4.7 | 1.4 | 3.5 |
| 3. Public budget deficit (c) (as % of GDP) | 1979-81 | 9.9 | 3.1 | 9.9 |
| 4. Public debt over taxes (d) | 1982 | 2.3 | 1.0 | 3.3 |
| . Foreign | | 1.2 | 0.5 | 1.4 |
| . Domestic | | 1.1 | 0.5 | 1.9 |

Source: a) Brazil: Fundacao Getulio Vargas, *Conjuntura economica*; Korea: Economic Planning Board, *Monthly Statistics of Korea*; Mexico: Banco de Mexico, *Indicadores Economicos*.

b) OECD, *Financing and External Debt of Developing Countries*, 1986 Survey.

c) Brazil and Mexico see a). Korea: B. Aghelvi, J. Marquez-Ruarte, *A Case of Successful Adjustment: Korea's Experience during 1980-84*, IMF Occasional Paper No. 39, Washington, D.C., 1985.

d) Brazil: Central Bank of Brazil, *Brazil Economic Program*, 1986; Korea: IMF, *Government Finance Statistics Yearbook*; Mexico: Banco de Mexico, *Indicadores Economicos*.

5. Jeffrey D. Sachs, *op. cit.*, p. 525. Tax ratios are a poor proxy for tax burden because excessive taxation eventually may reduce tax revenues as a percentage of GDP as well as recorded GDP itself as the underlying tax base.

6. B. Balassa and others, *Toward Renewed Economic Growth in Latin America*, Institute for International Economics, Washington, D. C., 1986 are a prominent example. However, comparison of Latin American with East Asian, especially Korea policy performance, otherwise documented throughout the pamphlet, is conspicuously absent in the case of government regulation.

7. Morgan Guaranty, *World Financial Markets*, January 1987.

support farmers' incomes, has maintained tight foreign-exchange control for capital-account transactions and a restricted import regime. It will be shown below that it was the quality rather than the quantity of government intervention that accounts for the divergent country experiences.

Let us now turn to indicators the values of which are as strikingly divergent for the three countries as the economic performance they are supposed to determine. Table I presents the corresponding data for the eve of countries' debt-servicing capacities. First, the two Latin American mega-debtors still share a low resource base in exportables which necessarily exacerbates debt servicing problems. The theoretical underpinning of this statement is familiar from the interwar transfer debate: the more demand elastic the production structure of the debtor country, and the closer its demand structure to that of the recipient country, the less the debtor is likely to suffer a secondary burden via deterioration in the terms of trade when it tries to generate a trade surplus.⁸ Manufactures are assumed to have these beneficial qualities.

Table I shows the striking difference in manufactured export ratios. But even if primary commodities are added, the difference in export ratios remains significant. Consequently, while debt as a proportion of GDP (albeit heavily distorted by disequilibrium exchange rates) was quite similar for the three countries at the onset of the debt crisis, debt-to-export ratios were much lower for Korea than for Brazil and Mexico. Second, the build-up of foreign debt went along with much weaker fiscal discipline in Brazil and Mexico than in Korea. Public budget deficits (given here at the consolidated public sector level) were largely due to losses of public enterprises in all three countries. But central government surpluses helped to contain them in Korea, while in Brazil and Mexico government deficits added to parastatal losses. As a result, public foreign (as well as domestic) debt as a proportion of public revenues was more than two, respectively three times higher in Brazil and Mexico than in Korea. Hence, with rationed foreign credit and insufficient cuts in public spending, the public debt overhang in both Brazil and Mexico was bound to induce excessive taxes, high real interest rates (to attract public bond finance), or inflation. Since 1982, this has determined economic performance more than external adjustment did, as will be shown in section 3.

8. For an application of the interwar transfer debate to the current developing country debt problem, see Helmut Reisen and Axel Van Trotsenburg, *Developing Country Debt: The Budgetary and Transfer Problem*, OECD, Development Centre Studies, Paris 1988.

II. The Allocation of Foreign Borrowing and Export Performance

Korea's low debt-export ratio indicates that it may have allocated a larger share of foreign borrowing to investment in export industries than did Brazil and Mexico. The relevant period to test this hypothesis goes from 1978 to 1982 when the bulk of debt was accumulated in all three countries. Alternative broad sources for the increase in gross external debt are investment for import substitution, finance of consumption and the build-up of official reserves and private foreign assets.

Mexico has been, by all standards, the most obvious case of misallocation of foreign finance.⁹ News about the size of oil reserves and the government's plans to exploit these had initiated an oil boom since 1977, boosting domestic and foreign private expectations as well as public spending. The latter, however, expanded far beyond the relative increase of the petroleum sector, because the government embarked upon heavy investments also in non-oil activities where private investment was considered insufficient. While the government spent revenues before they actually materialised, private companies also spent on ambitious expansion with foreign credit. The underlying assumption of both the public and private sector was apparently that future oil revenues would suffice to maintain exchange rate.¹⁰ Had these expectations been fulfilled, this could have meant an efficient intertemporal allocation of Mexican investment and consumption. From 1980 on, however, private investors made massive switches into foreign assets because the government failed to respond to less-than-expected oil revenues and rising dollar interest rates. The peso appreciated rapidly in real terms, giving rise to devaluation expectations, and the public budget deficit approached 15 per cent of GDP in 1981. During 1980-82, private capital flight, computed as errors and omissions plus variations in short-term assets held abroad by residents, was the equivalent of public external borrowing.¹¹ According to Morgan Guaranty's calculations, Mexico's debt-export ratio would stand at 0.6 (compared with 3.6 in 1985), assuming that in the absence of capital

9. A detailed account of the Mexican experience during 1977-83 is found in Guillermo Ortiz, "Economic Expansion, Crisis and Adjustment in Mexico (1977-83)", in M.B. Connolly and J. McDermott (eds.), *The Economics of the Caribbean Basin*, Praeger, New York 1985, pp. 68-100.

10. Guillermo Ortiz, *op. cit.*, p. 77, mentions that during 1977-81 when private foreign debt increased from 5.4 to 15.6 billion dollars, few firms took advantage of an exchange rate risk coverage facility opened at Banco do Mexico in 1977.

11. Data are from Alain Ize and Guillermo Ortiz, "Fiscal Rigidities, Public Debt, and Capital Flight", *IMF Staff Papers*, Vol. 34.2 (June 1987), pp. 311-332.

12. Morgan Guaranty, *World Financial Markets*, March 1986, Table 12 on p. 15.

flight debt accumulation and related interest payments would have been reduced and other financial flows would not have differed from actual.¹²

Brazil, unlike Mexico, had no significant capital flight until 1983 when foreign credit became rationed. But again, the delayed fiscal and exchange rate adjustment accounted for the deterioration of debt indicators during 1978-82. Higher dollar interest rates and increased oil prices were largely reflected in growing twin deficits in the public budget and the current account through government subsidies that maintained a low domestic price of oil and state enterprises borrowing to finance the increased debt service.¹³ Thus, increased deficits did not reflect an increase of investment which as a fraction of GDP averaged 25.7 per cent during 1979-81 as it did for 1965-77. The rapid increase in foreign debt, however, was matched by strong export performance during the latter period, because exchange rate overvaluation in neighbouring countries and import surge from oil exporting countries provided a temporarily favorable environment. Only in 1982 did it become apparent that the cruzeiro was overvalued given the accumulated debt levels, increased dollar interest rates, and a less favourable world demand for Brazilian exports. The overpriced currency did not induce capital flight because tight money had raised domestic interest rates and indexation of bonds reduced incentives to switch into foreign assets.

Korea's debt accumulation was closely tied to investments and deficits of public enterprises.¹⁴ Foreign borrowing added to domestic savings and investment by the same amount. However, a certain part of foreign finance is judged to have gone into inefficient import substitution, like chemicals, non-ferrous metals, and machinery.¹⁵ What distinguishes Korea from both Brazil and Mexico, then, is not that it avoided mis-allocation when external finance was cheap but that the Korean authorities were much quicker to correct poor policies. While Mexico continued to peg to the strengthening US dollar at a fixed parity, and Brazil in a crawling peg, Korea switched already in early 1980 to an exchange rate basket, thus restoring external competitiveness. In contrast to Brazil, Korea adjusted domestic oil prices to the international price level already by 1979.

13. Rudiger Dornbusch, "External Debt, Budget Deficits, and Disequilibrium Exchange Rates", in G. Smith and J.T. Cuddington (eds.), *International Debt and the Developing Countries*, The World Bank, Washington, D. C., 1985, pp. 213-235.

14. Bijan B. Aghevli and Jorge Marquez-Ruarte, "A Case of Successful Adjustment : Korea's Experience During 1980-84", *IMF Occasional Paper* No. 39, Washington, D. C., 1985.

15. Yung Chul Park, "Korea's Experience with External Debt Mangement", in G.W. Smith and J.T. Cuddington, *op. cit.*, pp. 289-328.

Since end of 1980, financial restraint helped to contain inflationary pressures and reversed the gap between increases in real wages and productivity. From 1983 on, the resumption of growth, together with high elasticity of the tax system, increased tax revenues so that the public sector deficit and the rate of monetary expansion could be sharply reduced.

The crucial question arises, then, why both Brazil and Mexico were so slow to adjust to deteriorating external conditions. One convincing economic answer has been found in Latin America's postwar trade policies resulting in vested interests which time and again have effectively prevented decisive and lasting exchange rate adjustment.¹⁶ By contrast, strong outward orientation (since 1963) has generated a large foreign trade sector in Korea. Hence, Brazil and Mexico need a larger depreciation to generate foreign exchange worth an extra percent of GDP than does Korea. To be effective, depreciation means a fall of real wages in terms of tradables. Because required depreciation is smaller in Korea and applies to a large sector of the economy, inflationary real wage resistance is weak while the growth stimulus induced by devaluation is strong. The opposite holds in the Latin American context where past inward orientation has sheltered a large share of the economy from foreign competition. Workers, managers and owners of large companies, public enterprises and other actors in non-traded activities who enjoy access to cheap imports at an overvalued exchange rate hence are likely to lobby against a competitive exchange rate. The resulting appreciation then often leads to a tightening of import protection, adding to the anti-export bias. Moreover, fluctuations in the real exchange rate resulting from discretionary devaluations with subsequent inflation-induced real appreciations tend to discourage exports because of expectations that the realigned structure of price will not continue. Finally, with inconvertible exchange rates, discrepancies between the official and the market rates (black market premiums) arise which act like an import tariff inducing resources into import-competing sectors.

Delayed adjustment in Brazil and Mexico during 1980-82 had a high price in terms of the subsequent adjustment requirement during 1983-85 because a) the preceding imbalances were excessive, b) interest payments abroad rose as a result of debt accumulation (even though interest rates fell), c) foreign lending was cut off at short notice and d) terms of trade deteriorated. Policy response showed a mixed success ; export performance

16. The argument given here follows Rudiger Dornbusch, "Policy and Performance Links between LDC Debtors and Industrial Nations", *Brookings Papers on Economic Activity*, 2: 1985, pp. 303-356 and Jeffrey D. Sachs, *op. cit.*, especially on pp. 543-564.

was good when compared to preceding years but insufficient to significantly reduce debt-export ratios and to avoid the need for import cuts. Moreover, after initial success, the policy deficiencies stylised in the preceding paragraph loomed again large in both Brazil and Mexico, in remarkable contrast to Korea (Table 2).

Table 2. External Performance and Policy Indicators 1983-85

| | Period (avg.) | Brazil | Korea | Mexico |
|--|----------------------|----------------------|----------------------|----------------------|
| 1. Export growth (a) (% p.a., dollar terms) | 1983-85 | 8.2 | 9.1 | 2.4 |
| 2. Import compression (a) (% avg. 1983-85 vs. 1979-81) | 1983-85 | -32.2 | 28.2 | -39.6 |
| 3. Non-interest current account surplus as a fraction of exports (a) | 1983-85 | 0.2 | 0.1 | 0.5 |
| 4. Debt over exports (a) (change during period) | 1983-85 | -0.4 | 0.2 | 0.0 |
| 5. Real exchange rate (a) (1977 = 100) | 1983 1984 1985 | 72.8 76.3 75.0 | 89.4 88.0 81.7 | 82.4 97.5 96.9 |
| 6. Black market premium on official exchange rate (b) | 1985 | 26.9 | — | 20.7 |
| 7. Effective rates of protection in the manufacturing sector (%) (c) | 1980-82 | 44 | 28 | 37 |

Source: a) IMF, International Financial Statistics; OECD, Financing and External Debt of Developing Countries, 1986 Survey.

b) Parallel market and official rates are from IMF, International Financial Statistics; Brazilian black market rates are from 1986 World Currency Yearbook (International Currency Analysis, Inc., 1986).

c) S.J. Anjaria, N. Kirmani, and H.B. Petersen, Trade Policy Issues and Developments, IMF Occasional Paper No. 38, Washington D.C., 1985, table 64 on p. 149.

The real exchange rate index is based on the annual average exchange rate of the US dollar per domestic currency weighted for changes in the domestic versus the US wholesale price index. Decrease denotes devaluation.

In the early years of the debt crisis, one prevailing idea was that problem debtors such as Brazil and Mexico could restore creditworthiness by 1985/86 through reducing

debt-export ratios towards a level of about 200 percent.¹⁷ This is not what happened. Only Brazil's debt-export ratio improved slightly during 1983-85, down from 4.0 to 3.6, a level from which Mexico's debt ratio did not move between 1983 and 1985. It is interesting to note, that even Korea's debt-export ratio deteriorated, despite successful export performance, up to 1.7 from 1.5. To understand why debt dynamics fell short of expectations consider Cline's cash-flow model :

$$\dot{d}^* = (i^* - \lambda)d^* - x \quad (1)$$

which links the change of the debt-export ratio, d^* , to the nominal interest rate on debt, i^* , relative to the growth rate of export revenue, λ , and the non-interest current account surplus as a fraction of exports, x .

The effective interest rate, computed as total interest payments on foreign debt as a fraction of foreign debt at the end of the preceding year, averaged 8.8 for Brazil, 9.5 for Korea, and 10.1 for Mexico during the period 1983-85.¹⁸ Annual export growth fell below interest in all three countries, notably in Mexico, badly affected by deteriorating export prices. Hence only a large import compression in Brazil and Mexico has avoided a further increase in the debt-export ratios, resulting in current account surpluses net of interest payments abroad to the equivalent of one fifth of Brazilian and half of Mexican exports. While variations of official foreign exchange reserves were insignificant, unrecorded capital outflows which continued during 1983-85 in Mexico and became important in Brazil also explain why debt-export ratios failed to improve.

Why exports did not perform better in Brazil and Mexico, is partly made apparent in Table 2. After initial heavy devaluations, the real exchange rate appreciated again, especially in Mexico where in 1985 it was nearly as overvalued as early 1982. While Mexico's devaluations lagged well behind domestic inflation, no allowance was made in Brazil for the strengthening of the dollar far above purchasing power parity in world currency markets up to early 1985. A further anti-export bias were the black market premiums that both Brazil and Mexico allowed to develop. Finally, while import protection in both these countries exceeded the respective levels in Korea already before the debt crisis, trade policies kept on diverging thereafter. While the Korean authorities accelerated their efforts to liberalise the trade system with the introduction of a five-year plan

17. Most prominently represented by William R. Cline, *International Debt: Systemic Risk and Policy Response*, Institute for International Economics, Washington, D. C., 1984, especially pp. 39-69.

18. Source : OECD, *Financing and External Debt of Developing Countries*, 1986 Survey, Paris 1987.

in early 1984, Brazil and Mexico first moved to increased import quota restrictions and domestic price controls. Finally, monetary and fiscal restraint was insufficient in Brazil and Mexico to release sufficient exportables for foreign demand.

III. Public Debt, Fiscal Rigidities, and External Competitiveness

Recent literature on LDC debt has increasingly realised that it is the budgetary rather than the trade problem which has effectively prevented the restoration of international creditworthiness for most problem debtors.¹⁹ In fact, excessive public debt levels have introduced another motivation for the affected governments against a competitive exchange rate. Consider the public budget identity (including the central bank)

$$e[(r^*+e)(b^*-nfa^*)-(\dot{b}^*-\dot{nfa}^*)]=t-g-(r^*+e)b+\dot{b}+\dot{M}/P \quad (2)$$

which links the interest service on net foreign public debt (gross debt, b^* , less net foreign assets of the central bank, nfa^*) less new net foreign lending to the public, $(\dot{b}^*-\dot{nfa}^*)$, to domestic sources of financing. These are tax revenues, t , new net domestic public debt, \dot{b} , the change in real reserve money, \dot{M}/P , and what is saved on public non-interest outlays, g , and on interest service for domestic public debt, $(r^*+e)b$. All items in the budget equation are expressed in real terms to capture inflation which acts as a hidden capital levy on outstanding debt. The real exchange rate is denoted by e , a sustained real depreciation by $e(>0)$, The foreign real interest rate is r^* , which has been substituted for the domestic real interest rate, r , by

$$r=r^*+\dot{e} \quad (3)$$

assuming interest rate parity and rational expectations.

The budget equation, as stated above, demonstrates the negative short-term fiscal impact of a real depreciation if the public net financial transfer abroad (interest minus new net foreign lending) becomes positive. Exchange rate adjustment enhances external competitiveness but raises the local currency cost of servicing foreign public debt and,

19. See, e. g., Vito Tanzi and Mario Blejer, "Public Debt and Fiscal Policy in Developing Countries", in K. Arrow and M. Boskin (eds.), *Economics of Public Debt*, forthcoming, and Helmut Reisen and Axel van Trotsenburg, *op. cit.*, especially pp. 21-56.

with financial openness and rational expectations, even of servicing domestic public debt.²⁰ Only for countries like Taiwan or Venezuela where public net foreign assets exceed public foreign debt does this conclusion not hold. If the public sector is a net debtor in foreign currency and fiscal rigidities prevail (because fiscal adjustment is prevented by tax evasion, avoidance, ect. and spending cuts meet political resistance), then external competitiveness is bound to be financed by higher public domestic debt and reserve money. The latter is likely to act as an inflation tax rather than seignorage if domestic growth is low. Inflation, however, may widen the non-interest public deficit due to tax collection lags. And issue of new domestic public debt withdraws loanable funds from private investment in a situation with imperfect capital mobility.

Fiscal rigidity, however, can be reduced even when discretionary action is not undertaken if taxes and non-interest spending respond automatically to change in the exchange rate. The automatic price and quantity response of taxes and non-interest spending are likely to be favourable for a Korea-type country with an important trade sector, and negative for inward-oriented countries like Brazil and Mexico. The price response depends on the determination of tradable prices and home good prices and the initial balance of the government budget :

$$S = P^* E(t_T - g_T) + P(t_N - g_N) \quad (4)$$

where S refers to the nominal public non-interest surplus, E to the nominal exchange rate (the real exchange rate being foreign prices over home prices $= e = p^* E / P$). The subscripts T , N stand for the tradables, respectively non-tradables activities underlying

20. Some Mexican economists have argued that devaluation serves governments to reduce the real value of their domestic interest bearing liabilities through a) price erosion and b) a fall in the domestic interest rate if, following an initial depreciation, the real exchange rate gradually appreciates over time. See Ignacio Trigueros and Arturo Fernandez, *Public Finance and the Role of Exchange Rate Policy in the Adjustment to Exogenous Shocks*, Instituto Tecnológico Autónomo de México, 1986; Alain Ize and Guillermo Ortiz, *op. cit.*; Alain Ize, *Fiscal Dominance, Debt, and Exchange Rates*, IMF Working Paper WP/87/52, 1987. Several comments are in order. First, depreciation takes a while to translate into higher prices. Second, bondholders will eventually be taking into account the possibility of depreciation-induced inflation and require correspondingly higher rates on domestic government debt. Third, the appreciation following 'overshooting' downward adjustment does not imply (like in short-run exchange rate models) a path towards a new equilibrium but rather paves the way for the next heavy devaluation. Forth, as shown here, a real depreciation implies increased budget outlays which may well outweigh the subsequent earnings on the interest rate during the phase of appreciation.

taxes and outlays. It follows that the public sector enjoys an automatic devaluation-induced increase in its non-interest surplus to the degree to which it taxes tradables and spends on non-tradables. This automatic increase is reinforced by the quantity response if the short-term impact of devaluation is growth-conducive rather than contractionary. Both conditions are more likely to prevail in Korea than in Brazil and Mexico.

The above considerations suggest to translate Cline's model of foreign debt dynamics to the public debt problem in linking the change of the foreign public debt-tax ratio, d_p^* , to the nominal interest rate on foreign debt, i^* , relative to the growth rate of tax revenues, γ , and the non-interest public budget surplus as a fraction of tax revenues, s , converting all values into dollar terms.

$$\dot{d}_p^* = (i^* - \gamma)d_p^* - s \quad (5)$$

Equation (5) is familiar from the government intertemporal budget constraint which posits a required non-interest budget surplus defined by real interest rates, growth rates, and accumulated debt levels if an explosion of debt ratios is to be avoided (insolvency).²¹

Table 3 tries to disentangle the interaction of fiscal performance, public debt ratios, and the exchange rate. Public debt as a fraction of GDP (and of taxes) was already substantially higher in Brazil and especially in Mexico than in Korea before heavy exchange rate adjustment became unavoidable.²² Thereafter, developments diverged sharply in the three countries with debt ratios exploding in Brazil and Mexico and virtually unchanged in Korea.

Korea's public sector was able to stabilise its relative debt position even without generating a non-interest budget surplus during 1982-85. Sustained, but limited real depreciation exerted only a minor negative local currency effect on public outlays because foreign public debt was comparatively small (9 per cent of GDP on average). External competitiveness fueled high GDP growth and consequently the tax base. Public revenues

21. See, e. g., Olivier Blanchard, Rudiger Dornbusch, and Willem Buiters, *Public Debt and Fiscal Responsibility*, Centre for European Policy studies, Paper No. 22, Brussels, 1985.

22. The difference in the 1982 data is mainly due to smaller coverage in Korean public-sector data. Owing to limited data availability, 19 nonfinancial public enterprises in which government ownership exceeds 50 per cent are omitted from the definition of the public sector. For the same reason, transactions of provincial and local governments are excluded from public-sector data. but they have only limited authority to tax and to borrow. Total expenditure of both subordinate government and public enterprises accounted for 16 per cent of GNP in 1984. The structure of the Korean public sector is described in Bijan B. Aghevli and Jorge Marquez-Ruarte, *op. cit.*, p. 22.

Table 3. Public Debt and Fiscal Response 1982-85

| | Period | Brazil | Korea | Mexico |
|---------------------------------|---------|--------|-------|--------|
| 1. Public debt, at mid-year (a) | 1982 | 24.9 | 15.4 | 44.6 |
| – domestic | | 6.5 | 6.3 | 23.9 |
| – foreign | | 18.4 | 9.1 | 20.7 |
| (as % of GDP) | | | | |
| 2. Public debt, at mid-year (a) | 1985 | 50.0 | 16.0 | 70.9 |
| – domestic | | 20.4 | 7.0 | 29.6 |
| – foreign | | 29.6 | 9.0 | 41.3 |
| (as % of GDP) | | | | |
| 3. Public revenue growth (a) | 1983-85 | -4.8 | 5.4 | -4.4 |
| (% p.a., dollar terms) | | | | |
| 4. Non-interest public (a) | 1983-85 | -2.7 | -0.3 | 2.3 |
| budget balance (% of GDP) | | | | |
| 5. Public budget deficit (a) | 1983-85 | -23.1 | -1.4 | -9.5 |
| (% of GDP) | | | | |
| 6. Domestic financing (a) | 1983-85 | 20.0 | 0.4 | 6.6 |
| (% of GDP) | | | | |
| 7. Inflation tax and | 1983-85 | 2.5 | 0.2 | 5.8 |
| seignorage (% of GDP) (b) | | | | |
| 8. Effective real interest | 1983-85 | 12.4 | 5.4 | 3.1 |
| rate on public-sector | | | | |
| domestic debt (c) | | | | |

Source: a) See Table 1, footnotes a) and d). Mid-year stocks of public debt are calculated as average between end-year stocks.

b) IMF, International Financial Statistics. Refers to real reserve money in 1980 prices times the annual rate of inflation (CPI).

c) See Table 1, footnotes a) and d). Derived from comparing the annual interest expense on domestic public sector debt with their estimated mid-year stocks.

Mexican public debt ratios are given for 1981 and 1985 and public revenue growth refers to 1982-85 in order to capture devaluation effects.

were boosted even in dollar terms and their growth largely exceeded effective real interest rates on both domestic and foreign public debt in 1982 and 1983. The reduction of the public budget deficit to 1.4 per cent of GDP on average during 1983-85 was instrumental in containing inflation and real rates of interest at low levels because public savings increased sufficiently as to meet the savings-investment balance compatible with reduced foreign capital intake. The successful fiscal performance is also apparent in the

way the remaining deficit was financed. The Korean government did not rely on reserve money creation as did both other countries, but on domestic nonbank and little external sources.

Brazil's public debt ratio, yet not too far above Korea's in mid-1982, rose steadily during 1983-85. By mid-85, total public debt was half of GDP, a ratio more than three times higher than Korea's. This poor result is explained by on-going overspending (as indicated by the non-interest budget deficit), negative public revenue growth in dollar terms, and a return on indexed government bonds far above inflation (as well as above real GDP and tax growth). Non-financial spending as a fraction of GDP increased from 33.5 per cent during 1979-81 to 34 per cent during 1983-85. Severe fiscal rigidity resulted mainly from production and consumption subsidies in the food sector and oil-substitution programme as well as from state enterprises like Siderbras, the steel group, and Eletrobras, the electric-energy holding company.²³ Public revenues tumbled by 26.5 per cent in 1983 (after conversion into dollars) compared to 1982, determined by a massive reduction in the real exchange rate (minus 18.3 per cent compared to 1982) and a sharp recession.

Moreover, the Brazilian government was misled to socialise private foreign currency debt in the Central Bank to avoid devaluation-induced bankruptcies of indebted private companies. Hence, the exchange losses which ensued following real depreciation were borne largely by the public sector. Decisive, however, for the rise of the public sector debt ratio was the large discrepancy between the real return on indexed government bonds and the growth of taxable output since 1984. The real return on public bonds was 21.3 per cent *ex post* in 1984, and 14.1 per cent in 1985. Such high interest rates reflected a growing risk premium fueled by a vicious circle of expected future debt service, budget deficits, inflation, and possible (domestic) default. Currency reforms, however, such as the Cruzado Plan which the Brazilian authorities adopted in February 1986, are bound to fail as long as they do not address a) the public debt overhang (via asset transactions), b) massive overspending, and c) an inelastic tax system.

Mexico's approach to public debt finance diverged very much from Brazil's forthright debt strategy, but equally failed to restore fiscal-financial stability and international creditworthiness. Developments have been largely determined by the exchange rate which fluctuated wildly after Mexico's temporary debt moratorium in 1982 and which exerted strong local currency effects on public debt service because public debt was relatively

23. Morgan Guaranty, *World Financial Markets*, August 1986, p. 6.

high already in 1981. From mid-1981 to mid-1983, public debt surged from 44.6 per cent to 83.5 per cent as a fraction of GDP, but declined thereafter to 70.9 per cent in 1984 and 1985. This trend in public debt ratios had a strong link to the real exchange rate which depreciated by 33.5 per cent in 1982, but appreciated by 18.3 per cent in 1984 (compared to the preceding year). It was equally determined by the movement in the non-interest budget with a modest surplus during 1983-85 (2.3 per cent of GDP) after outsized deficits (9.9 per cent of GDP in 1982). Mexico, like Brazil, socialised an important part of private foreign debt since August 1982. Although during 1983-85 two-thirds of the total budget deficit (9.5 per cent of GDP) was financed at home, domestic public debt in terms of GDP was steadily reduced during 1982 and 1985. The inflation tax, amounting to 5.8 per cent of GDP during the period, inflicted important capital losses on domestic money holders. Likewise, highly negative real returns on Mexican treasury bills during 1982-83 contributed to public debt erosion.

Outsized budget deficits of the consolidated public sector in both Brazil and Mexico undermined stabilisation, growth-oriented adjustment, and confidence of foreign and domestic residents. In the absence of capital inflows, fiscal deficits drain available savings and prevent the control of monetary aggregates. Yet, they tend to drive real interest rates to excessive levels (by world standards) and hence discourage investment, or, if interest levels parity is not respected, feed capital flight. As a result, creditworthiness is not regained and current account targets (imposed by the capital balance) remain tight. That is what Korea has avoided due to its favourable trade structure and fiscal discipline. Table 4 documents the evidence.

Without the possibility of foreign financing, public deficits²⁴ have to be matched by the private-sector surplus of savings over investment. Hence, the public sectors of Brazil and Mexico have become not users of household and corporate savings which shows up in the low national savings and investment ratios compared to Korea. Inflation is bound to rise with budget deficits financed at home unless private demand for credit is not commensurately curbed. This is obvious not only for Mexico, where the bulk of domestic financing has been provided directly by the central bank. In Brazil, where

24. Governments in high-inflation countries like to redefine public budget deficits and are partly supported by modern macroeconomic theory, essentially because the inflation component in nominal interest payments represents repayment of principal rather than the real cost of borrowing. However, to trace the link between fiscal imbalances (which have to be financed by somebody) and monetary aggregates, the nominal concept seems more suited. For a discussion of this issue, see Robert J. Barro, *Macroeconomics* John Wiley and Sons, New York, 1984, pp. 373-383.

Table 4. The Consequences of Fiscal Imbalances

| | Period (avg.) | Brazil | Korea | Mexico |
|--|---------------|--------|-------|--------|
| 1. Public borrowing requirement (% of GDP) (a) | 1983-85 | 23.1 | 1.4 | 9.5 |
| 2. Gross domestic savings (b) | 1983-85 | 15.9 | 25.8 | 20.3 |
| – Public (% of GDP) | | -21.2 | 7.9 | -3.1 |
| 3. Gross domestic investment (b) (% of GDP) | 1983-85 | 17.3 | 29.1 | 21.0 |
| 4. Money and quasi-money (b) (growth, % p.a.) | 1983-85 | 237.6 | 13.0 | 58.3 |
| 5. Return on foreign currency (% p.a.) (c) | 1983-85 | 257.8 | 16.3 | 69.0 |
| 6. Private deposits (d) | | | | |
| (bn. dollars at year-end) | | | | |
| – domestic banking system | 1980-81 | 41.0 | 19.7 | 59.6 |
| | 1985 | 23.5 | 31.4 | 34.6 |
| – held abroad | 1980-81 | 4.8 | 3.2 | 10.8 |
| | 1985 | 16.6 | 5.4 | 21.5 |

Source: a) See Table 1, footnotes a) and d).

b) IMF, International Financial Statistics, for gross domestic investment. Gross domestic savings are defined as gross domestic investment minus net capital inflow (OECD Development Cooperation Directorate). For public investment, see source given in Table 1, footnotes a) and d).

c) IMF, International Financial Statistics. Return on foreign currency is the London Interbank Offered Rate on one-year US \$ deposits plus the annual depreciation of the end-of-period exchange rate against the US \$.

d) BIS, International Banking Developments and IMF, International Financial Statistics. Private deposits held in the domestic banking system are demand, time and savings deposits of non-bank in local currency converted at end-of-year exchange rates. Deposits held abroad are defined as gross liabilities of commercial banks in BIS-reporting countries toward the private sector of the respective debtor country.

authorities relied much less on reserve money creation, monetary policy has accommodated government and private-sector borrowing needs with the subsequent loss of control over inflation. High inflation and currency erosion induce private savings to be invested in domestic inflation hedges and assets denominated in foreign currency while their allocation to the domestic banking system is discouraged. While financial intermediation,

indicated in table 4 by private deposits held in the domestic banking system, has been intensified in Korea in the 80s, Mexicans and Brazilians increasingly preferred to hold their deposits outside their country.

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