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Savings, Investment, and Growth in Mexico:  
Five Years After the Crisis

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Abstract

Despite Mexico's recent remarkable progress in adjusting its fiscal and external accounts and in restructuring its economy, the recovery of growth has remained elusive. This paper reviews some aspects of Mexico's recent performance and suggests that systemic adjustment uncertainty, and policy conflicts between stabilization and real depreciation objectives, are among the factors that have contributed most to delaying the private sector's investment response and preventing a sustainable recovery. The paper also assesses future growth prospects and resource mobilization needs, based on a growth model that fully incorporates the internal transfer problem and emphasizes solvency requirements.

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### Summary

After three decades of fast growth, Mexico's economic expansion seems to have come to a halt after 1982. Yet, with a labor force increasing at close to 4 percent a year, the need for economic growth is clearly pressing. In the last five years Mexico has made remarkable progress in reducing its fiscal deficit, depreciating its exchange rate, liberalizing its foreign trade, and privatizing public enterprises. It is not yet clear, however, whether these efforts are sufficient to allow growth to resume at satisfactory levels.

To address this issue, the paper starts by reviewing some aspects of Mexico's recent economic performance. In particular, it examines critically the view that identifies the lack of savings as the main culprit behind the recent record of stagnation, high inflation, and balance of payments difficulties. From a review of the savings-investment identity, it suggests that the direction of causality between savings and investment has been ambiguous. To illustrate this point, a simple, three-gap growth model is presented. An investment gap is added to the usual savings and external gaps, and the paper shows that, while the recession periods of 1982-83 and 1986-87 seem to fit the investment-gap classification, the aborted recovery of 1984-85 appears to be a reflection of a binding external gap.

Among the factors that would engender a suitable environment for investment, price stabilization and the need for both debt and trade negotiations are underlined. The paper argues, however, that Mexico should not let debt negotiations get in the way of comprehensive trade agreements. The need for a recovery of financial intermediation is also emphasized, and, in that context, the relevance of indexed financial instruments and the issue of capital controls and financial openness are briefly discussed.

On the basis of a simple growth model, which incorporates both internal and external transfer requirements, the paper finally concludes that as investment recovers, savings will again become the binding constraint on growth. A satisfactory growth recovery will require, in particular, that public-sector savings outside the petroleum sector rise by at least 3 to 4 additional percentage points of GDP beyond their 1986-87 average. Additional resources, of about 2 percentage points of GDP, should come simultaneously from the external sector, entailing a moderate current account deficit that can be compatible with a reduction over time of the foreign debt burden, provided that the corresponding resources are invested productively.

The paper scrutinizes the sensitivity of the above conclusions to changes in underlying parameters. It shows in particular that in the absence of fiscal adjustment, a moderate reduction in the price of oil or a rise in external interest rates could lead to public sector insolvency.



## I. Introduction

With a population growing at 2.7 percent a year, and a labor force at close to 4 percent a year, Mexico's need for economic growth is obvious. Yet, after three decades of fast growth, Mexico's economy seemed to have come to a halt after 1982. The average growth rate of output in the period 1983-87 was slightly negative, in sharp contrast with an average 6.4 percent yearly growth from 1965 to 1986 (see Chart 1). After remaining in the single-digit range for two decades, inflation also started to creep upward in the mid-1970s, and in 1987 reached a record 159 percent (Chart 2). <sup>1/</sup> At the same time, after rising by 38 percent from 1965 to 1981, real wages fell back by 34 percent from 1982 to 1987 (Chart 3). Finally, total external debt rose, as a proportion of gross domestic product (GDP), from 12 percent in 1965 to 77 percent in 1987 (Chart 4). The poor performance of the Mexican economy in the last five years has occurred in the context of a 52 percent drop in the terms of trade, owing to a combination of falling oil prices and real exchange rate depreciation, and a reversal of net foreign capital flows, from an average 2 percent of GDP inflow in 1977-81 to an average 5 percent of GDP outflow after the crisis (Charts 5 and 6).

Three recommendations are generally made to countries that are attempting to raise their growth rate: (i) key macroeconomic prices should be set right; in particular, the real exchange rate should be adjusted to accommodate available foreign resources; (ii) domestic resource mobilization for investment should be raised, particularly through increasing public savings; and (iii) the overall efficiency of investment should increase; structural policies to achieve that goal include trade liberalization and privatization. Mexico has made remarkable progress in the last five years on all these points. The primary fiscal deficit fell by more than 12 percentage points of GDP between 1982 and 1987 (Chart 7); the real exchange rate depreciated in 1987 by at least 50 percent with respect to its 1981 level (Chart 8); and an ambitious economic restructuring program has been launched in the last two years in the form of accelerated trade liberalization and wide-ranging privatization.

It is not yet clear, however, whether these efforts will be sufficient to allow Mexico's growth to resume at levels close to pre-crisis historic averages, of more than 6 percent. To address this issue, this paper examines the macroeconomic and financial underpinnings of resource formation and capital accumulation. <sup>2/</sup> It starts by reviewing and contrasting the pre- and post-crisis performance of the Mexican economy. It then examines current perspectives and conditions for higher growth. Two issues receive particular attention.

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<sup>1/</sup> Consumer price index (CPI), December to December.

<sup>2/</sup> Other recent papers with fairly similar aims include Gil Díaz and Ramos Tercero (1987), Buffie (1988), and Dornbusch (1988).

First, and perhaps not surprisingly, a return to historic pre-crisis growth rates will require a substantial additional effort to mobilize larger resources for investment. In that context, the quality and depth of fiscal adjustment can and should still be significantly improved. Public sector savings, outside the petroleum sector, should rise by at least 3 to 4 additional percentage points of GDP beyond their 1986-87 average, which, although relatively harder to achieve than the gains made since the crisis, should still be feasible, provided that growth picks up simultaneously to facilitate the adjustment. Additional resources--of about 2 percentage points of GDP--should, however, come simultaneously from the external sector, entailing a moderate current account deficit that can be compatible with a reduction over time of the foreign debt burden, provided that the corresponding resources are invested productively.

Sufficient resource generation, however, does not guarantee investment and growth. Two obvious additional requirements are, on the one hand, a compatible vector of relative prices, and, on the other, a sufficient willingness to invest. In fact, the severity of the required relative price adjustment, rather than insufficient demand restraint or excessive fiscal deficits, seems to have been the main culprit for Mexico's post-crisis record of low or negative growth with high inflation. On the other hand, it is not yet clear whether the relative price structure that will emerge from current stabilization efforts will be compatible with steady growth, particularly in the context of wide trade liberalization. In order to encourage and support the private sector's willingness to invest, however, the relative price structure needs to be both credible and stable. The high level of uncertainty that has surrounded business conditions since 1982 pertains, in particular, to the feasibility and sustainability of abrupt shifts in relative prices as well as to radical changes in commercial and industrial policies. That uncertainty has probably been largely responsible for the relatively sluggish response of private investment to emerging opportunities, particularly in the export sector. The paper argues that successful stabilization and comprehensive trade agreements could contribute to reducing this lingering systemic uncertainty. They would not only encourage the private sector's willingness to invest but would also help to increase available resources for investment, by relaxing existing constraints to foreign lending and by facilitating the return of flight capital. The debt and capital flight issues may thus need to be addressed in a broader context that includes trade agreements. In contrast, a strategy that would focus exclusively on debt could run the risk of slowing down Mexico's integration with the rest of the world, which, ultimately, is the key condition for lasting growth.

The paper is divided into five sections: Sections II and III deal with Mexico's recent economic performance; Section IV examines growth prospects; and Section V concludes with a brief discussion of some policy issues.

## II. Recent Economic Performance: Fiscal Adjustment and Financial Disintermediation

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This overview of recent economic performance starts by addressing two issues that have clear implications for growth. It first reviews the extent and quality of fiscal adjustment after the crisis. Although the magnitude and rapidity of the deficit reduction are often quoted as unusual examples of a particularly severe fiscal adjustment, the quality of the adjustment also needs to be examined. It is argued here that, although the magnitude of the fiscal effort should not be underestimated, particularly in view of the difficult environment in which it took place, its quality could be improved to be more conducive to growth. In particular, public savings need to rise in a sustainable and noninflationary way.

The second issue is financial intermediation. Because it improves the average productivity of investment by directing funds to projects with the highest returns, financial intermediation also has a clear positive incidence on growth. Yet, since 1982 there has been a sustained process of financial disintermediation as the demand for domestic banks' instruments has declined markedly while the recycling of capital flight by foreign banks has been interrupted by the debt crisis. Reasons for the decline of domestic intermediation are given.

The empirical analysis is facilitated by an integrated set of flow-of-funds accounts shown in Tables 1-11, which cover the public, private, financial, and external sectors in Mexico during the last four administrations, starting with Díaz Ordaz's (GDO) last six-year term (sexenio) of the "stabilizing development" era (1964-70), proceeding with Echeverría's (LEA) "shared development" period (1970-76), López Portillo's (JLP) "oil boom" (1976-82), and, finally, De la Madrid's (MMH) six-year term of "crisis and adjustment" (1982-87). Although the accounts do not match perfectly, which is not surprising given the restrictions of published statistics and some inconsistencies between cash and accrual accounting, this rough attempt to provide an integrated flow-of-funds analysis for an extended period seems to provide a useful picture of the evolution of savings, investment, and financial intermediation in Mexico in the last two decades. The accounts include a correction for inflationary amortization on all peso-denominated assets and liabilities, as well as a correction for eliminating valuation gains and losses on dollar instruments, owing to exchange rate movements. All accounts are thus expressed in real flows, deflated by nominal GDP. Additional explanations on these corrections can be found in the Appendix.

# 1. The extent of fiscal adjustment

Tables 2 and 3 give an overall view of the evolution of the public sector budget restriction. The most striking feature is, of course, the steady worsening of the operational deficit until the crisis, followed by a strong reversal to an operational surplus. In terms of the primary deficit, the improvement between 1981-82 and 1987 was nearly 13 percentage points of GDP (Chart 7). This performance is certainly no small feat, particularly in view of the long history of fiscal expansion in Mexico, where public sector spending jumped from 19 percent of GDP in 1965 to 44 percent in 1982, and in view also of the recent record of economic contraction, rising inflation, and structural adjustment, which greatly complicated the fiscal effort for several reasons.

Looking first at the revenue side, it appears that nonpetroleum-related federal government revenue fell as a proportion of GDP during the latest six-year term. This can be explained, first, as a result of "the Tanzi effect" on a tax system that, before 1987, was not indexed. 1/ But there was also an important shift in the structure of production from the nontradable to the less heavily taxed tradable sector, as well as a likely shift from the formal to the informal sector, which typically occurs in hard times. Although the exact impact of those two shifts are difficult to measure, it is likely to be sizable.

On the expenditure side, it is worth noting that current noninterest expenditure, after rising by nearly 50 percent between the GDO and the JLP administrations, has remained stable since the crisis, although the real wage has fallen, on average, by 18 percent (Table 4). 2/ The fall of the public sector wage was compensated for by increases in transfers and other current expenditure. 3/ The relative rigidity of noninterest current spending, however, may largely reflect the difficulties involved in cutting absolute levels of spending in the context of a stagnant economy and a fast-growing population with basic social needs. 4/

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1/ In particular, firms were allowed to deduct full nominal interest from their income tax base, which was equivalent to providing a credit subsidy that rose with inflation. Estimates of the magnitude of the Tanzi effect for Mexico in recent years can be found in Gil Díaz and Ramos Tercero (1987). They range from 0.6 to 0.8 percent of GDP.

2/ As measured by industrial wages deflated by the GDP deflator.

3/ Interestingly enough, the wage bill of the public-owned petroleum company (PEMEX) fell by only 5 percent, which reflects the strategic importance of that sector in wage bargaining.

4/ Fiscal adjustment would have been obviously much easier in a fast-growing economy, since it could have been done without painful cuts in the absolute levels of the services provided, involving in particular the size of the bureaucracy.



Total real interest expenditure also increased by close to 2 percentage points of GDP after the crisis, mostly on account of foreign interest (Table 5). The latter, in turn, was the result of the sharp real exchange rate depreciation that accompanied the process of adjustment and the high public external debt legacy of the oil boom. Interestingly enough, net domestic real interest payments remained stable, as the higher inflation tax on money balances after the crisis was offset by higher real interest rates on the interest-bearing public debt. In the Mexican context of high financial openness, this reflected in part the sizable average real depreciation observed over the six-year period, compared with the substantial real appreciation during the previous administration.

In view of the higher net interest payments, the rigidities found in noninterest current spending, and the actual reduction of nonpetroleum public sector revenue, the bulk of fiscal adjustment came from the petroleum sector and capital spending. Revenue from the public-owned petroleum company, PEMEX, rose sharply as a result of increases in domestic petroleum prices <sup>1/</sup> and the favorable effects of exchange rate adjustments on peso proceeds from petroleum sales abroad. Capital spending, on the other hand, was severely cut. While the reductions outside the Federal Government could reflect, to some extent, a return to more normal levels from the highs reached during the Echeverría and López Portillo administrations, in the case of the Federal Government, the cut brought the level of post-crisis capital spending below the level reached at the end of the stabilizing development period. There is little doubt that basic spending in infrastructure needs to be higher, both to sustain private investment and to provide the population with sufficient levels of social services.

Chart 9 provides a year-by-year picture of the extent and quality of fiscal adjustment during the last administration. It gives a yearly breakdown of the reduction of the primary deficit that occurred between 1982 and each successive year between 1983 and 1987, as well as the average for 1983-87. After isolating the exchange losses suffered in 1982, which were a one-time event linked to the nationalization of the banking system, the average adjustment shrinks from 11.5 percentage points of GDP to 8 percentage points of GDP, about half of which was obtained through cuts in capital expenditure. The continuous fall in real wages was responsible for an additional  $1\frac{1}{2}$  to 2 percentage points of deficit reduction. The rest of the adjustment during 1983-85 was obtained through higher petroleum revenues. The steep fall in international prices and some lag in domestic price adjustments resulting from accelerating inflation, however, have practically eliminated this source of adjustment in 1986-87. Other budgetary items, which include nonpetroleum-based public sector revenue and other current expenditure including current transfers, taken altogether, have not

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<sup>1/</sup> After falling by half from 1977 to 1981, the real price of gasoline jumped nearly threefold from 1981 to 1983.

contributed at all to the adjustment, except in 1987, when an adjustment of 2 percentage points of GDP was achieved mostly through cuts in current transfers and other current expenditure. Overall, the quality of the adjustment needs to be improved as most of the adjustment outside exchange losses has so far been supported by an excessive compression of capital expenditure, by deep cuts in real wages that are probably not sustainable, and by a strong reliance on a petroleum sector that remains vulnerable to fluctuations in international prices and to lags in domestic price adjustments. Deeper fiscal adjustments involving measures to boost tax revenue, stabilize domestic petroleum receipts, reduce public sector employment, and achieve further cuts in noninterest current expenditure will still be necessary in the future. Although measures taken in 1987 are significant first steps toward these goals, the resumption of growth would greatly facilitate future improvements.

## 2. Shifting patterns of financial intermediation

Table 10 presents a synthetic view of financial intermediation during the last few six-year periods, expressed in the form of a matrix of intersectoral real flows as a percentage of GDP. Each row gives average financial flows from creditors to debtors for each six-year period. The last row is the financial counterpart of the resource balance identity given in Table 1. <sup>1/</sup> First, the steady contraction of real domestic bank credit to the private sector results from the combination of a falling private demand for domestic financial assets, particularly during the LEA and MMH administrations, and a larger intake of available credit by the public sector, especially during the JLP administration. The table also shows the gradual increase before the crisis in the pace of capital flight, the partially offsetting increase in foreign credit to the private sector, and the large increase in foreign credit to the public sector. Thus, while domestic bank intermediation to the private sector was being eroded, and an increasing share of private financial savings was leaving the country, foreign banks were, in fact, recycling these resources inside the country. This pattern, which explains the relative constancy of the current account deficit, contributed to alleviating the negative impact of the erosion of domestic credit on private investment. It was interrupted by the debt crisis, however, as the net real flow of foreign credit to the private sector turned negative and the real flow of credit to the public sector was cut by half during the last administration, while capital flight remained substantial.

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<sup>1/</sup> There are some discrepancies between figures given in the financial matrix and the net resource balance of each sector, as shown in the overall resource balance, which reflect some of the limitations of this exercise. However, the discrepancies are generally rather small--within 1 percent of GDP.

The decline in domestic bank intermediation during the Echeverría administration can be explained by the evolution of average returns. Real average deposit rates turned negative with higher inflation, whereas they had been positive during the low inflation years of the stabilizing development era (Table 11). During the first five years of the López Portillo administration, however, the accumulation of financial assets with domestic banks picked up in spite of still negative real rates on peso-denominated deposits. This resulted essentially from two factors. On the one hand, the interest differential with dollar instruments in the United States remained high, as the peso was steadily appreciating. As long as the euphoria of the oil boom lasted, the public either believed that the situation was sustainable, or they thought that their holdings of dollar-denominated deposits provided a sufficient and safe hedge against exchange risk. <sup>1/</sup> On the other hand, financial savings reached very high levels during the fast-growth years of the oil boom (Table 8), helping to sustain the demand for local assets. There was an abrupt disintermediation in 1982, however, as real balances of money and quasi-money in the hands of the public fell by nearly 20 percent as a result of capital flight and negative real interest rates.

The liabilities of the banking system toward the private sector continued to decline in real terms after the crisis in spite of an improvement in real average returns (Table 11). One explanation for this disappointing performance is the substantial reduction in financial savings that took place after the crisis as a result of lower real savings (Table 8). Another is the high variability of returns, illustrated in Charts 10 and 11. Chart 10 shows the compounded returns on one-month deposits in Mexico, invested in any month between January 1980 and February 1988 and withdrawn in March 1988, as compared to the consumer price index (CPI) or to yields offered by similar deposits in the United States. It is particularly striking that investments in peso assets made in early 1985, for example, would have had a rate of return 30 percent lower than their U.S. counterparts, while investments made in early 1983 or early 1986 would have had returns that are 20 to 30 percent higher. Chart 11, on the other hand, gives the compounded real yield of one-month deposits calculated monthly over successive six-month intervals. <sup>2/</sup> Setting aside cyclical downturns at the beginning of each year, <sup>3/</sup> the real deposit rate turned negative on three occasions after 1981: in 1982 and early 1983, at end-1985, and at end-

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<sup>1/</sup> The proportion of dollar-denominated deposits remained at around 25 percent from 1977 to 1981, up from around 5 percent in the early 1970s.

<sup>2/</sup> The rate given per month is the compounded return from month  $t-3$  to month  $t+2$ . It is thus a combination of backward- and forward-realized returns.

<sup>3/</sup> Real interest rates tend to fall around the beginning of each year, as nominal interest rates do not vary to offset higher inflation, owing to controlled price and wage realignments.

1987. The pattern of events in all three cases was very similar--abrupt exchange rate devaluations forced by capital flight led to inflationary outbursts, and, with passive nominal interest rates, to falling real returns. The process was facilitated by real appreciations coming on the wake of the jump depreciations, which discouraged the public from further acquisitions of foreign assets. 1/

A final explanation for the decline of domestic bank intermediation has been the increasing importance of capital markets after the crisis, as a result of a greater use of the stock market by both the private and public sectors. The share of government securities directly sold to the public and traded in the stock market increased from 8 percent of total financial instruments in 1985 to close to 20 percent in 1987. On the other hand, the demand for stocks drove the stock market index to more than a sixfold increase between end-December 1982 and end-December 1987, in spite of the September crash. 2/ Thus, in 1987, the end-period value of tradable financial instruments in the hands of the public became more important than the value of time deposits, while the ratio between the two had stood at only about one third in 1983. Most of the increase in private instruments traded in the stock market was in the form of stocks, and most of it took place in 1987 before the crash, as firms scrambled to benefit from the boom. 3/ Activity in the stock market fell abruptly after the crash and the fall in demand for stocks spilled over to other financial instruments, giving rise to a new burst of capital flight. It is still too early to tell, however, to what extent the crash may have dealt a lasting blow to this alternative form of intermediation.

### III. Recent Economic Performance: A Three-Gap Analysis

This part undertakes a critical examination of the dominant view that links the fiscal deficit to the recent record of stagnation, high inflation, and balance of payments difficulties. According to this view, excessive deficits and restrictive monetary policies have crowded out private investment, leading to excess demand, supply contraction, stagflation, and a recurrent tendency to run into balance of payments difficulties. It is thus the lack of savings that has restricted investment and growth while generating external disequilibrium. A simple "three-gap" model is used, first, to illustrate alternative limits to growth arising from total available resources, foreign

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1/ A theoretical analysis of linkages between fiscal developments, capital flight, and exchange rate dynamics with an application to the case of Mexico can be found in Ize and Ortiz (1987).

2/ At its peak in early October 1987, the index had risen in real terms 29 times over its end-1982 level.

3/ Firms also started to alter their financing mix in 1987 as a result of the reforms of the corporate income tax that progressively phased out the deductibility of nominal interest payments.

currency, and investment. From an examination of the savings investment identity, it is then argued that, although savings and investment fell drastically after the crisis, causality has probably been bidirectional, as the lack of investment and growth has also led to a reduction of available savings. It is also argued that, aside from the availability of savings, many factors have contributed to depress private investment. Particular emphasis is put on the high level of systemic uncertainty that has prevailed in recent years, including the very large relative price fluctuations that have come together with large external shocks, a disorderly inflationary process, and the need for structural adjustment. It is argued, finally, that the aborted economic recovery of 1984-85 is probably more a reflection of inadequate structural adjustment than of excessive domestic demand, that is, an "external gap" rather than a "savings gap".

1. A three-gap growth model

Consider the following stylized growth model:

$$s_H + s_F = i \quad (1)$$

$$s_F = CA(e, i) \quad CA_e < 0, 0 < CA_i < 1 \quad (2)$$

$$g = vi \quad (3)$$

$$s_H < \bar{s}_H \quad (4)$$

$$s_F < \bar{s}_F \quad (5)$$

$$e < \bar{e} \quad (6)$$

$$i < \bar{i} \quad (7)$$

where  $s_H$  and  $s_F$  are domestic and foreign savings,  $i$  investment,  $e$  the real exchange rate,  $g$  the growth rate, and  $v$  the incremental capital output ratio (ICOR). Equation (1) is the resource balance, equation (2) the balance of payments, and equation (3) the growth equation.  $CA$  is the current account, which improves with a devaluation and worsens with investment because of capital imports.  $s_H$ ,  $s_F$ ,  $e$ , and  $i$  are constrained:  $s_H$ , because there is a limit to the possible reduction of domestic consumption, given by fiscal rigidities and minimum private consumption requirements;  $s_F$ , because capital inflows are in limited supply;  $e$ , because changes in domestic relative prices are constrained by social factors, in particular by a limit to the reduction in real wages; and  $i$ , because the private sector's willingness to invest is constrained by the general economic and political environment.

There are three equations and five unknowns. In principle, therefore, there are as many ways to solve the model as there are combinations of the four constrained variables, taken two at a time.

Take, first,  $s_H = \bar{s}_H$  and  $s_F = \bar{s}_F$ ; then equations (1) and (3) yield the resource-constrained growth rate

$$g_s \propto [\bar{s}_H + \bar{s}_F] \quad (7)$$

which corresponds to the traditional savings-gap growth model.

Take, on the other hand,  $s_F = \bar{s}_F$  and  $e = \bar{e}$ ; equations (2) and (3) then give the foreign-exchange-constrained, or "external-gap," model

$$g_e = vCA^{-1}(\bar{s}_F, \bar{e}), \quad CA_{\bar{s}_F}^{-1} > 0, \quad CA_{\bar{e}}^{-1} > 0 \quad (8)$$

where  $CA^{-1}$  is the inverse current account.

Finally, pick  $i = \bar{i}$  and fix either one of the three remaining variables; the "investment-gap" growth rate is then  $\underline{1/}$

$$g_i = v\bar{i} \quad (9)$$

Given that  $g_s$ ,  $g_e$ , and  $g_i$  are not decreasing with any of the parameters  $\bar{s}_H$ ,  $\bar{s}_F$ ,  $\bar{e}$ , and  $i$ , it is easy to see that there is an equivalence between the minimum of the three possible growth rates and the set of nonbinding restrictions. For example,  $g_s < \min(g_e, g_i)$ , the savings-gap case, implies  $e < \bar{e}$ ,  $i < \bar{i}$ ; neither the exchange rate nor investment is then a binding constraint. The same holds true for other models. Thus, which model dominates only depends on which constraints are relatively more binding.

In the case of the savings-gap model, resources are tight but the private sector is willing to invest all that is available, and the shift in relative prices is such as to allow for importing the capital equipment corresponding to that level of investment. In the external-gap case, on the other hand, the limit to the achievable relative price shift has been attained and capital imports are restricted by foreign currency availability, hence, constraining investment and growth. Although additional domestic resources can be freed for investment, they

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<sup>1/</sup> In addition, there would be, in principle, another model combining  $\bar{s}_H = s_H$  and  $e = \bar{e}$ . In this model, however, it is easy to show that an appreciation of the exchange rate would increase investment, use up part of the remaining available foreign savings, and raise growth. It would thus only apply to the case in which  $e$  is bounded from below, which is not very interesting or realistic.

cannot be used. Domestic savings need, instead, to accommodate downward, by falling with output in typical Keynesian fashion. Finally, in the investment-gap case, three situations can arise. The most common would be one in which there is no domestic consumption spree ( $s_H = \bar{s}_H$ ), and the resources that are available for investment are not being used because the private sector is not willing to invest them domestically, preferring instead to accumulate foreign assets ( $s_F < \bar{s}_F$ ). A second scenario would be one in which the available resources are consumed instead of being invested abroad ( $s_F = \bar{s}_F$  and  $s_H < \bar{s}_F$ ). This could occur particularly if the government--by raising domestic interest rates--financed a higher deficit by borrowing the resources that the private sector would otherwise invest abroad. A third scenario would be a variant of the first, with a binding restriction on the extent of exchange rate adjustment. If  $s_F$  cannot fall sufficiently for a full domestic utilization of remaining resources,  $s_H$  must then fall, because (i) the private sector ends up consuming the resources that cannot be sent abroad owing to exchange rate restriction, or (ii) the deficit is increased, or (iii) a recession induced by insufficient demand reduces private savings.

This model is obviously quite stylized. In particular, it does not allow for changes in the real interest rate to affect the ICOR and the propensity to save; it also does not have a monetary side, and does not specify the short-run output dynamics and corresponding price adjustments. Nevertheless, it provides a characterization of the general nature of the possible growth trajectories that will be useful in comprehending the recent Mexican experience discussed in the forthcoming two sections.

## 2. Savings and investment after the crisis: savings gap or investment gap?

Table 1 shows the evolution of the savings-investment identity. After remaining at around 3 percent of GDP before the crisis, external savings fell to -1.5 percent of GDP after the crisis. Given that domestic savings also fell by 1 percentage point of GDP, investment fell by more than 5 percentage points of GDP. In contrast with usual interpretations, however, the point that needs to be stressed is that the direction of causality does not necessarily run only from savings to investment and growth. Low growth and depressed levels of investment, particularly private investment, can also reduce available savings in several ways. First, lower growth and investment imply lower aggregate demand, an improved current account, and--for a given level of foreign financing--a larger external asset accumulation in the form of capital flight or foreign reserves. It is quite striking that domestic capital outflows have been, in fact, increasing regularly along the four six-year periods. Thus, the recent decline of external savings resulted as much from higher domestic capital outflows as from lower foreign capital inflows. In the aggregate, these figures suggest, therefore, that

excess savings were being used to accumulate foreign assets rather than domestic assets.

Domestic savings are also likely to be negatively affected by the lack of growth. The point has already been stressed in the case of the public sector. For the private sector, it may also hold for various reasons. In a permanent-income framework, it will hold as long as the fall in growth is perceived to be temporary. But it will also hold in the steady state if there is a minimum subsistence level of consumption that grows with the size of the population, so that a lower economic growth reduces the savings margin. As the figures in Table 1 indicate, after rising and reaching their peak during the high-growth years of the oil boom, private savings have fallen to their lowest level in the years of low or negative growth since the crisis. Account should be taken, however, of the parallel reduction of private disposable income, which has taken place over the last twenty years as a result of the rising petroleum surplus and higher inflation tax on domestic public debt, net of interest payments (Table 8). While falling with respect to levels reached during the oil boom, the ratio of private savings to disposable income after the crisis remained, on average, at levels similar to the one reached before the oil boom. The evidence on the basis of six-year averages is thus not entirely conclusive. <sup>1/</sup> Yearly values of that ratio (Chart 12), however, show a clear positive correlation between savings and short-term growth, in line with a permanent-income hypothesis. Recent econometric studies of the consumption function appear to corroborate that conclusion. <sup>2/</sup>

There are, on the other hand, several reasons why investment should have fallen independently of resource availability. In the nontradable sector, the cost of imported machinery rose strongly in terms of nontradable prices. Also, capacity utilization fell sharply after 1982 as a result of the acute compression of domestic absorption (Chart 19). Finally, the burden of foreign debt rose abruptly after the 1982 devaluation. <sup>3/</sup> In this context, the first priority of most firms was to reduce their leverage by bringing down their domestic indebtedness. Thus, the only sector where large investments could have taken place is the tradable sector, and, in particular, the exportable sector. Yet, although detailed statistics that would give a breakdown of investment between nontradables and tradables are not readily available, casual observation seems to indicate that investment in the

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<sup>1/</sup> As documented in Section IV, one possible reason for the inconclusiveness of average trend figures is the large shift in the distribution of income, which seems to have taken place after the crisis and which, other things being equal, could have pushed the savings ratio upward.

<sup>2/</sup> See Gomez Oliver (1988).

<sup>3/</sup> Total private foreign debt rose from 9.5 percent of GDP at end-1981 to about 24 percent at end-1983. On the impact of devaluations on the financial position of firms and their investment decisions in Mexico, see Cordoba and Ortiz (1983) and Easterly (1985).



exportable sector has not picked up appreciably so far, in spite of a remarkable growth of nonpetroleum exports (Chart 13). Most firms, in fact, seem to have utilized their underutilized capacity at home to export, a situation that can revert itself as domestic demand recovers, as it did in 1985 after the mini-boom of 1984-85.

Among the most important economic variables that can justify the wait-and-see attitude of most investors are the volatility of the structure of relative prices, the confusing signals sent by the Government until 1985 concerning its commercial policies, and the threat of protectionist barriers. Key among relative prices is the real exchange rate that, as Chart 8 indicates, has gone through at least two deep phases of depreciation and appreciation. After depreciating in 1982-83, following the debt crisis, and then again in 1985-86, following the oil shock, it appreciated in 1984 and early 1985, and in 1987-88, as a result of the Government's two stabilization attempts. Under these conditions, it is not surprising that investors did not want to commit themselves to large trade-oriented investments before they saw a relatively stable and sustainable real exchange rate. <sup>1/</sup> Many variables, in turn, currently contribute to the uncertainty of the exchange rate, including the sustainability of the current real wage compression, the high volatility of the world price of oil--and, hence, of Mexico's terms of trade--and the vagaries of stabilization, which may produce large deviations from optimal relative prices.

Other relative prices have tended to vary widely as well, reflecting a particularly chaotic inflationary process. <sup>2/</sup> This has resulted in part from the Government's consistent opposition to any indexing since 1982. In particular, government-administered prices have fluctuated widely as a result of discrete and partially unpredictable adjustments that reflected shifting concerns between reducing the deficit and stabilizing inflation. <sup>3/</sup> In this context, firms have therefore also faced substantial cost uncertainty.

The extent of the Government's commitment to a radical departure from an import-substitution model toward export-led growth was also uncertain, particularly before mid-1985, when extensive protection was left in place. The current administration's willingness to open the economy became much clearer at the end of the six years, as import-

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<sup>1/</sup> As the option-pricing literature seems to suggest, a wait-and-see attitude could occur even if investing within the range of observed exchange rates has consistently remained profitable. If investments are bulky and nonreversible, it may pay to wait until the steady-state exchange rate is known. See Pyndick (1986) and Dornbusch (1987).

<sup>2/</sup> Alberro (1987) analyzes the variance of relative prices in Mexico and argues that relative price confusion has probably been responsible for a significant backward shift of the supply curve.

<sup>3/</sup> See, as an illustration, the real price of two main energy products, gasoline and electricity, shown in Chart 14.

licensing requirements have been drastically reduced, 1/ and Mexico has finally agreed to adhere to the General Agreement on Tariffs and Trade (GATT). 2/ The credibility and sustainability of trade liberalization remain an issue, however, particularly in the context of the still uncertain outcome of the current stabilization effort.

The threat of protectionism from industrial countries has also slowed down investment. For example, the threat of barriers to trade from the United States, 3/ Mexico's main trading partner, has remained a particularly worrisome issue for Mexican firms, in spite of two recent important bilateral trade agreements. 4/ U.S. firms--particularly in-bond industries and automobile companies--seem, for their part, to have benefited most so far from favorable exchange rates and the changing Mexican trade policies, partly because they have felt less vulnerable to potential protectionist backlashes. 5/

3. Inflation, relative prices, and crowding out:  
savings gap or external gap?

The previous section argued that, over the last six-year period, the investment gap may have been more binding overall than the savings gap. A finer analysis of events, however, shows clearly different phases during the period: economic activity picked up in 1984-85 after falling abruptly in 1982-83, but fell again into another extended recession in 1986-87. It is important, in particular, to examine why the 1984-85 recovery could not be sustained. Private investment did recover to some extent during these years, as a result of a partial return of confidence and higher domestic demand. However, the current account surplus practically vanished in 1985, after having reached 3 percent of GDP in 1983, and foreign reserves fell by \$2 billion, after having risen by \$3 billion in both 1983 and 1984. It thus appears that the investment gap was probably not the dominant constraint during this

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1/ Controlled items represented only about 25 percent of import value at end-1987 versus 85 percent in 1984. On the other hand, the production-weighted tariff has fallen from 29 percent in mid-1985 to about 14 percent at end-1987.

2/ On the details of this agreement and other recent developments in Mexican trade policy, see De Mateo (1987) and Bucay and Perez Motta (1987).

3/ An estimated 35 percent of non-oil Mexican exports to the United States were affected in 1983 by nontrade barriers of one kind or another. (See De Mateo (1987).)

4/ One agreement, signed in 1985, required U.S. firms to give "proof of injury" in order to qualify for countervailing duties. The other, signed in 1987, established a framework for discussion of bilateral trade issues between the two countries.

5/ Employment in in-bond industries increased from 127,000 in 1982 to 233,000 in March 1986, or 11 percent of total industrial employment, while employment in the rest of the industrial sector fell by 12 percent during the same period.

recovery period. Was it then the savings gap that interrupted the recovery, or was it the external gap?

For the answer, one must first consider the usual diagram of a home goods/traded goods open economy model shown in Chart 15. The NN is the locus of equilibria in the nontradable market; the BB corresponds to tradable goods. Domestic demand is on the horizontal axis; the real exchange rate, on the vertical axis.  $E_0$  is the initial pre-crisis equilibrium in both markets. As a result of the debt crisis, the BB shifted upward to BB'. Following a heavy demand contraction and a large real depreciation, the 1983 equilibrium was somewhere around  $E_1$ , with a balance of payments surplus and a deep recession. As the exchange rate appreciated and demand picked up, however, the economy gradually moved back in the southeast direction, reaching in 1985 point  $E_2$ , with a balance of payments deficit and an overvalued real exchange rate. At that point, large excess capacity remained in the home-goods market, as shown in Chart 19.

From  $E_1$ , the Government could have followed two alternative courses of action. It could have allowed demand to expand as it did in 1984-85, while maintaining the real exchange rate at its 1983 level so as to reach a point around  $E_0$  in 1985--the new equilibrium in both markets. Or it could have kept demand constrained at its 1983 level, while allowing the exchange rate to appreciate as it did in 1984-85. Under the first course of action, inflation would have been higher, while under the second, recession would have deepened. The trade-off involved is illustrated in Charts 16 and 17, in which a counterfactual exercise is presented, based on a simple autoregressive reduced-form model of price and output, estimated with monthly data over the period 1980-87. <sup>1/</sup> In the steady-exchange-rate scenario, inflation reaches 160 percent at end-1985, about three times its actual level. In the steady-demand scenario, output falls by about 3 percent below its historical level in 1984-85, while inflation falls temporarily at mid-1985 from 50 percent to 25 percent, before rising back to actual observed levels in 1986-87. These results are thus suggestive of the difficulties involved in controlling inflation through restrictive demand management, and in achieving a lasting real exchange rate depreciation. The course taken by the Mexican authorities reflected their concern in containing inflation while maintaining a minimum level of growth. The fact that their endeavor did not lead to a sustainable equilibrium in 1985 is thus, perhaps, more a reflection of the magnitude of the relative price adjustments involved than of inadequate macroeconomic management. Given the rigidities involved in real wage adjustments and in the transfer of capital stock from the nontradable to the tradable sector, the size of the real depreciation needed to obtain a short-run equilibrium in both home- and tradable-goods markets was inconsistent with a reduction over time of inflationary pressures. The latter was a straightforward manifestation of a binding external gap.

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<sup>1/</sup> Details on the specification and estimation of this model can be found in the Appendix.

Although insufficient relative price adjustment, rather than excessive demand, may then be blamed for the failure of the 1984-85 recovery, an additional question concerns the composition of aggregate demand during that period. In particular, was private investment crowded out by excessive public spending? If so, the resulting containment of aggregate supply could, perhaps, also be blamed for the disappointing performance of the balance of payments. It does not appear, however, that private investment was particularly constrained by resource availability during the 1984-85 recovery. The evolution of real interest rate on commercial paper is shown in Chart 11. Up until mid-1985, that rate remained below 8 percent. Furthermore, the spread between the commercial paper rate and the deposit rate remained below 2 percent, which is a clear indication of an easy credit market. There are several reasons for this. First, the private sector was, on the whole, unwilling to invest. Second, the authorities followed a very passive monetary policy until mid-1985, letting private credit expand freely. 1/ Finally, the substantial fall in real wages gave rise to increasing profit margins and generally comfortable levels of liquidity. Table 9 shows the evolution, by six-year terms, of the functional distribution of private disposable income, following National Accounts methodology. The share of profits expanded by nearly 10 percentage points of GDP between the administrations of López Portillo and De la Madrid. Although these results should be viewed with some caution, 2/ similar indications can be obtained from the evolution of an average profit margin index calculated on the basis of wage, import, and energy costs, as shown in Chart 18. 3/

The authorities did, however, tighten the credit market considerably from mid-1985 to end-1986, as shown in Chart 11, by the spread between the money market rate and the deposit rate. This policy was followed to counteract capital flight and balance of payments pressures, after it became clear that the recovery could not be sustained. Although tight credit contributed to bringing an end to the recovery, crowding out was not, by itself, responsible for the fact that the recovery could not be sustained. 4/

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1/ See Banco de México (1986).

2/ In particular, the profit share includes the self-employed and the informal sector, which probably expanded after the crisis. However, an extreme correction made on the basis of a 3 percent yearly increase in employment after the crisis still yields an increase of more than 5 percentage points of GDP of the profit share (see Table 9).

3/ See the Appendix for details on the computation of this index.

4/ This conclusion is supported by an industrial survey by Banco de México, which indicates that bank financing became a significant production constraint only at the end of 1985 and during 1986.

#### IV. A Savings-Constrained Growth Exercise

As the economic situation in Mexico stabilizes under a new structure of relative prices, as excess capacity in the nontradable sector is eroded, and as Mexican firms develop more confidence in the permanence of the new price vector and in their newly discovered abilities as exporters, it is to be hoped--particularly in light of current extended prospects of scarce foreign resources--that investment will eventually pick up to the point where domestic resource availability will again become the key limiting factor. It is thus necessary to examine growth prospects as a function of available resources. This section carries out a simulation exercise using a model that assumes that only the availability of savings limits investment. Using the overall resource balance of the economy, the model determines, for a given ICOR and private saving propensity, the growth rate that is consistent with a determined level of fiscal adjustment, external gap, and inflation. <sup>1/</sup> The comparison of the rates of growth of debt (both total external debt and total public debt) and output determines, in turn, whether the economy as a whole and the public sector in isolation are on solvent growth trajectories characterized by nonincreasing debt to GDP ratios. The model implicitly assumes that the post-crisis external and investment gaps are not binding. Additional resources that are freed for investment are thus assumed to be invested productively in the country, while relative prices adjust freely to ensure equilibrium in the balance of payments.

Under current conditions, the exercise seems to indicate that:

- (i) noninflationary growth could be limited to around 3 percent; and
- (ii) fiscal solvency could become an issue if large negative shocks were to hit the budget, in particular, if the world price of oil were to fall further or external interest rates were to rise. On the other hand, the exercise also seems to suggest that growth could pick up substantially under a combination of fiscal adjustment, smoother access to foreign financing, somewhat easier terms on the foreign debt, and a reduction--if not a reversal--of capital flight, to reach levels comparable to pre-crisis historic averages.

##### 1. The underlying growth model

Consider the following macro-identities, defined in domestic currency at current prices

$$Y = C_P + C_G + I_P + I_G - Z \quad (10)$$

$$C_G + r^H_B + r^F_{EB} \frac{B}{G} + I_G - T = \dot{B} \frac{H}{G} + \dot{EB}^F_G \quad (11)$$

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<sup>1/</sup> Earlier growth exercises for Mexico are carried out in Ortiz and Serra (1986), and Zedillo and Solis (1986). See also Dornbusch (1988) for a simpler but more recent exercise.

$$Z + r^F E(B_G^F + B_P^F) - T^F = E(\dot{B}_G^F + \dot{B}_P^F). \quad (12)$$

The notation is explained in Table 12. Deflating equations (11) and (12) by  $Y$ , and using lowercase letters to define the deflated variables, these equations become

$$c_G + i_G - t + (r^H - \pi - g) b_G^H + (r^F + \rho - \pi - g) E b_G^F = \dot{b}_G^F \quad (13)$$

$$z - t^F + (r^F + \rho - \pi - g) b^F = \dot{b}^F \quad (14)$$

where  $\rho$  is the rate of nominal depreciation,  $\pi$  the rate of inflation,  $g$  the real rate of GDP growth, and where

$$b_G = b_G^H + E b_G^F \quad (15)$$

$$b^F = E(b_P^F + b_G^F). \quad (16)$$

Define  $d_G$  and  $d^F$  as the current fiscal and external deficits, inclusive of the inflation tax on domestic debt:

$$d_G = c_G - t + (r^H - \pi) b_G^H + r^F E b_G^F \quad (17)$$

$$d^F = z - t^F + r^F E(b_G^F + b_P^F). \quad (18)$$

Define  $s_G$  and  $s^F$  as the seigniorage obtained on public and external debt:

$$s_G = g b_G + (\pi - \rho) E b_G^F \quad (19)$$

$$s^F = (g + \pi - \rho) b^F. \quad (20)$$

Finally, define private disposable income as

$$y_d = 1 - t + t^F + (r^H - \pi) b_G^H - r^F E b_P^F \quad (21)$$

and assume

$$c_p = (1 - \alpha)y_d \quad (22)$$

$$g = \frac{1}{\beta} (i_p + i_G) \quad (23)$$

where  $\alpha$  is the propensity to save and  $\beta$ , the ICOR. <sup>1/</sup>

Solving the model gives growth as a function of the current fiscal and external deficits, private disposable income, the propensity to save, and the ICOR:

$$g = \frac{1}{\beta} (d^F - d_G + \alpha y_d). \quad (24)$$

The following sets of solvency constraints for the public sector and the economy as a whole are also obtained:

$$\dot{b}_G = d_G + i_G - s_G < 0 \quad (25)$$

$$\dot{b}^F = d^F - s^F \leq 0. \quad (26)$$

## 2. The choice of an ICOR and a savings propensity

Table 13 gives a range of values for the ICOR obtained on the basis of an assumed 5 percent average yearly depreciation of the capital stock. <sup>2/</sup> The use of gross nominal investment, as given by national accounts data (excluding changes in inventories), leads to values around 1.8 for the whole period of 1965-81. The average ICOR then jumps to 2.3 after the crisis, even after excluding the years of falling output (1983 and 1986). Although this could reflect the higher price of imported machinery, the use of real investment instead of nominal investment does not significantly alter the results. <sup>3/</sup> The investment volume index published by Banco de México, however, shows a much smaller increase

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<sup>1/</sup> The model assumes that Ricardian equivalence does not hold, even in partial form. This assumption seems to be backed by the data, as alternative consumption functions that include government spending instead of taxes seem to lead to much more variable average saving propensities. See also Haque and Montiel (1987) for wider econometric evidence derived from a sample of developing countries.

<sup>2/</sup> The ICOR value is obtained as:  $v = i/(\delta + g)$ , where  $\delta$  is the rate of depreciation.

<sup>3/</sup> The higher price of imported machinery seems to be offset by the lower price of construction, owing to the fall in real wages.

after the crisis. Finally, leaving aside investment in construction, which has been substantial since the earthquake and which includes a large share of residential construction, and focusing instead on machinery only, the data show a decline of the ICOR from 1980-81 to the period after the crisis, which is to be expected in a situation where a large initial excess capacity is being eroded over time.

The ICOR could thus be slightly higher in forthcoming years than it was before the crisis, because of the higher price of imported equipment, although reductions in capital intensity should offset at least part of this increase. However, it is likely that the average productivity of investment will tend to rise in a situation of more stable and faster growth than the one experienced since the crisis, as the relative share of residential and other relatively unproductive investment diminishes. An average ICOR of 2, which is slightly higher than the pre-crisis average but somewhat lower than the observed post-crisis average, therefore seems to be a fairly reasonable assumption for the forthcoming sexenio. 1/

Table 14 indicates, on the other hand, that the average private saving propensity rose from 17 percent during Díaz Ordaz's term to 21 percent during the oil boom, and fell back to slightly above 17 percent after the crisis. The average during 1984-85, the years of the aborted recovery, was much higher, however, at 19.7 percent. A saving propensity of 18 percent, at mid-range between the exceptionally high level of the oil boom and the very depressed average level after the crisis, would therefore seem to be a reasonable estimate for the near future. 2/

### 3. Base simulations

Most of the basic parameters for the base simulations were taken from averages observed in 1986-87. This gives a tax pressure (excluding petroleum products) of 10.3 percent of GDP, an income from parastatals (excluding the petroleum company) of 8.7 percent of GDP, and non-interest current expenditure for the public sector as a whole of

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1/ A value of 2 would also correspond to an interpolation of the average oil boom ICOR of 1.8, obtained on the basis of a 30 percent real devaluation on a 33 percent share of imported machinery, assuming no reduction of capital intensity.

2/ Private savings are assumed to be unaffected by changes in real interest rates, which may not be entirely realistic, particularly in view of the fact that recent estimates of the consumption function in Mexico do seem to indicate some significant interest elasticity (see Gomez Oliver (1988)). Given the range, however, of the elasticities that have been found (around 0.3), and the size of the domestic public debt (around 20 percent of the GDP), the increase in private savings resulting from an increase in the real deposit rate would nearly be entirely offset by a fall in public savings, with no significant effect on overall savings.



21.5 percent of GDP. <sup>1/</sup> The base petroleum price is \$15 a barrel, yielding 11.2 percent of GDP in petroleum revenue, and the foreign interest rate is 8 percent. Scenarios with alternative assumptions on these last two parameters are also considered. The current account is assumed to equal the average surplus observed after the crisis, of 1.4 percent of GDP. A continuation of capital flight at the same average rhythm as the one observed after 1982--1.6 percent of GDP--and a steady reserve accumulation of 0.2 percent of GDP <sup>2/</sup> would imply a net positive foreign financing of only about 0.4 percent of GDP, much below the average level of about 2 percent of GDP observed during 1983-87.

The net inflation tax (including interest payments on domestic interest-bearing debt) is computed on the basis of a real domestic interest rate of 3 percent, a fixed nominal exchange rate, and 3 percent domestic inflation, thus assuming a complete success of the current price stabilization scheme. The reduction in the inflation tax induced by the fall in inflation is derived from the following demand equation for M1, estimated over the period 1965-87:

$$\text{Log } m_t = 0.44 \text{ Log } m_{t-1} + 0.53 \text{ Log } y_t - 0.31\pi_t - 0.78 \quad (27)$$

(3.60)                      (4.33)                      (5.71)                      (1.34)

where m is real money holdings, deflated by the CPI; y is real GDP;  $\pi$  is CPI inflation; and figures in parentheses are t-statistics.

The level of basic public investment, excluding on-lending, which is required to provide the country with sufficient infrastructure and to maintain a minimum capacity in the parastatal sector, is assumed to be 7.5 percent, nearly 2 percentage points higher than the level reached during 1986-87. This figure is obtained as follows: 3.3 percent for the Federal Government, which corresponds to the average reached during the oil boom; 1.2 percent for PEMEX, which is the average for the last three years; and 3.0 percent for other parastatals, including social security, which is somewhat higher than the levels reached during the stabilizing development and post-crisis periods but lower than the probably excessive levels reached during the Echeverría and López Portillo years. Finally, an increase in inventories of 2.5 percent of

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<sup>1/</sup> Notice, however, that these figures may be altered to a significant extent, depending upon the final outcome of the current stabilization scheme. Petroleum revenue and income from other parastatals could turn out to be substantially lower if the Government is forced to accept some appreciation of the peso and lags in public sector prices as the price to pay for stabilizing inflation. On the other hand, tax revenue may increase somewhat as a result of the Tanzi effect.

<sup>2/</sup> This corresponds to the amount necessary to maintain the ratio of foreign reserves to GDP at its average 1986-87 level, assuming average growth at 4 percent of GDP.

GDP is assumed, which corresponds to the average during the oil boom, as the latter constitutes a more normal period than the highly unstable and speculative post-crisis years.

Six variations of the base scenario are considered. In scenario (a), the world price for Mexican oil falls to \$10 a barrel, while in scenario (b), it goes back to the golden days of \$29 a barrel. In scenario (c), the domestic average price of petroleum products is raised by \$3.50, simulating the impact of keeping the domestic price of petroleum products at their highest peak in recent years. Scenario (d) corresponds to a 10 percent external interest rate, instead of 8 percent, and scenario (e), by lowering the ICOR by 10 percent, simulates the impact of productivity gains. Results appear in Table 15.

Compared with recent economic performance, the base scenario looks optimistic, with a 2.6 percent growth rate, 3 percent inflation, and a current account surplus of 1.4 percent of GDP. This is in spite of a substantial worsening of the operational fiscal balance from a surplus of 1.6 percent of GDP to a deficit of 3.3 percent of GDP, following the loss of the inflation tax and the increase of public capital expenditure. The scenario's feasibility depends, of course, on the realism of the chosen values for the ICOR and the private saving propensity, which are significantly better than the average observed during 1983-87. As argued before, however, these values do not appear unrealistic after the recent years of deep recession are set aside, especially 1983 and 1986, which yield atypically high ICORs and atypically low saving propensities. Thus, an important insight of this exercise is that, even under current resource availability, moderate growth levels could be sustainable and consistent with low inflation rates.

It is worth noticing, however, that while the external solvency constraint in this base scenario would be satisfied, public solvency would remain a critical issue, as the ratio of public debt over GDP would not fall over time. The public sector could, in fact, become insolvent relatively easily under negative fiscal shocks, as shown in Table 15, if the world price of oil worsened or if foreign interest rose. In both these scenarios, the operational deficit rises by around 1.5 percent of GDP while growth falls by around 1/2 of 1 percentage point, leading, as a result, to a steady increase over time of public debt over GDP. These results underline the need for further fiscal adjustment.

Scenario (b) further underlines how the world price of oil influences Mexico's growth capacity. Under a return to a world price of \$29 a barrel of oil, growth would increase by nearly 2 percentage points, as all the rent derived from higher oil revenues would be

invested by the private sector. <sup>1/</sup> This is a useful reminder of the severity of the shock that hit Mexico with the collapse of oil prices. While scenario (b) assumes no pass-through to domestic oil prices of higher world prices, scenario (c) indicates that a \$3.50 increase in the average price of domestic petroleum products <sup>2/</sup> would reduce the public deficit by nearly half, and raise growth by 1/2 of 1 percentage point. This result underscores the need for indexing public sector prices in an inflationary environment. <sup>3/</sup>

Finally, scenario (e) indicates that lowering the ICOR to 1.8, the same level as during the oil boom, would raise growth by nearly 1 percentage point. While underlining the obvious importance of raising the average productivity of investment, this last observation also serves as a yardstick for measuring the general sensitivity of the results.

4. Alternative adjustments: fiscal adjustment  
and foreign resources

Even with slightly more favorable assumptions concerning the price of petroleum, the ICOR, or other variables in the model, the rate of GDP growth would probably remain below 4 percent, which is still low in view of historic pre-crisis growth rates and a labor force growing at about the same rate. Faster growth would require additional fiscal adjustment or higher net external resources.

Table 16 synthesizes some results obtained with simulations that introduce these adjustment mechanisms. Column (a) is the basic fiscal adjustment scenario. On the revenue side, it raises the tax pressure to 12 percent, up from 10.3 percent. As Table 17 suggests, this increase seems reasonable when Mexico's tax revenues are compared with the averages of developing and industrial countries, or even with other Latin American countries, for example, Chile or Brazil. Revenue from direct taxation is substantially below the average of developing countries and is only about one third of levels reached in industrial countries. Given that Mexico's GDP per capita is substantially above the mean for developing countries, revenue from direct taxes could be somewhere between the means for developing and industrial countries. On one hand, Mexico, like other Latin American countries, faces problems of tax administration and tax evasion, which seem to require further attention. On the other hand, revenue from indirect taxes, as in Chile and Brazil, is relatively high by international standards. In Mexico, however, most of it comes from petroleum and petroleum derivatives.

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<sup>1/</sup> The model assumes away the possibility of having a fall in private savings induced by a positive wealth effect on consumption.

<sup>2/</sup> This corresponds to a 25 percent increase over average domestic prices in 1986-87.

<sup>3/</sup> Maintaining high levels of public sector prices without a relapse of inflation, however, could turn out to be extremely difficult in the context of a price stabilization program. In this case, fiscal adjustment would need to be reached through less inflationary measures.

Indirect taxes on other products seem to be rather low compared with those of other countries, although the evidence on this point is somewhat sketchy since Brazil is the only other clear point of reference in the table. Here, again, Mexico seems to face serious tax administration problems, in particular regarding its value added tax, which, in spite of relatively high rates, generates rather low revenues. 1/ One can infer from Table 17 that further gains in tax revenue could probably come from other taxes, particularly property taxes, which are also quite low by international standards.

Scenario (a) also assumes an increase of 0.3 percentage point of GDP in revenues from non-PEMEX parastatals, to 9 percent of GDP, which corresponds to the level reached in 1986. Some price adjustments, particularly for the electricity and transportation sectors, could be needed to achieve that goal. On the expenditure side, a 2.5 percentage point reduction in noninterest current spending is assumed. This would amount to a return to pre-oil boom levels, which would require a further reduction of only 1 percentage point with respect to the level reached in 1987. In a context of steady GDP growth, this adjustment should be achievable without great difficulty. 2/

Altogether, this scenario would raise the operational balance from a 3.3 percent deficit to a 0.7 percent surplus, freeing 4 percentage points of GDP as a result. After some reduction of private savings is accounted for, private investment would still rise by more than 3 percentage points of GDP, growth would increase by nearly 2 percentage points, and both the public and external debts would fall steadily as a ratio of GDP.

Scenarios (b), (c), and (d) combine the previous fiscal adjustment with larger external resources. In (b), net foreign financing would rise to 4.3 percentage points of GDP, so as to ensure a steady current account deficit of 2.5 percentage points of GDP. In (c), a 50 percent debt relief package is obtained on external public debt, which is equivalent to capturing the full value of the discount of the Mexican debt in the secondary market. Finally, (d) simulates the joint impact of a 50 percent debt relief package and the reduction of capital flight to zero. 3/ Table 16 then indicates that growth rates would range from 5.3 percent in the pure debt relief case to 6.3 percent in the foreign financing case, quite close to average historical growth rates before the crisis. Quite remarkably, although the reduction of the ratio of external debt over GDP over time would slow down in the case of pure foreign financing, it would nevertheless still be positive. A

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1/ In 1895 the value-added tax generated only about 3 percent of GDP in revenues, at a general rate of 15 percent.

2/ As noted before, however, further cuts in noninterest current spending could be needed to offset possible lags in public prices resulting from current stabilization efforts.

3/ This assumes that interest earned on financial assets abroad would be repatriated.

substantial increase in foreign financing could thus still be compatible with a slow but steady reduction over time of the external debt to GDP ratio, provided that external resources are invested productively.

## V. Some Policy Issues

Besides adequate resource mobilization, growth would also require, as underlined earlier, a consistent vector of relative prices and a sufficient willingness to invest. The relative price that needs to be most carefully monitored is the real exchange rate. It is difficult at this time to define a sustainable real exchange rate for the future, given the uncertain impact of recent trade liberalization measures and the lags inherent in the reorientation of economic activity. It is even more difficult to predict whether the exchange rate that will emerge from current stabilization efforts will be acceptable, given the uncertainty involved in the stabilization process. Leaving this issue aside, this part focuses instead on three current policy issues linked with the need to create an environment suitable for investment. First, it contrasts real versus nominal price stabilization and suggests that nominal stabilization is preferable for Mexico in spite of its short-run cost. Second, it discusses jointly the issues of debt and trade negotiations and suggests that Mexico should not let short-run debt negotiations get in the way of longer-run comprehensive trade agreements. Finally, it discusses some ways to revive financial intermediation.

### 1. Stabilization or indexation?

The large variance of relative prices and considerable uncertainty about future levels of key macroeconomic prices, particularly the real exchange rate, have considerably hampered the investment climate since 1982. To address this issue, Mexican authorities faced two options in 1983. They could have frozen key relative prices at a sustainable long-run equilibrium level and let inflation adjust to meet that target, given existing rigidities (in particular wage rigidities). Or, they could have tried to stabilize inflation as fast as possible and let relative prices adjust to meet that objective. The authorities chose the second option until mid-1985, and then were forced to undertake a new round of relative price adjustments as a result of the failure of the 1984-85 recovery and the 1986 oil price shock. They may have then contemplated in 1987 the possibility of indexing the economy, in the face of the favorable outturn of nontraditional exports and the emergence of a strong export-oriented lobby among private sector entrepreneurs. However, after the September stock market crash sent inflation past the 15 percent a month mark, as a result of capital flight and exchange rate depreciation, the authorities decided in early 1988 to go back to the stabilization option, with the implementation of the current solidarity pact.

In retrospect, it appears that a new attempt at outright stabilization, in spite of its possible short-run cost, was justified in the Mexican case as a preferable alternative to indexation, for several reasons. First, unlike in 1983-84, underlying conditions and fundamentals at end-1987 seemed to be generally appropriate for a shock program to have a reasonable chance of success and, hence, to be credible. The fiscal position was not grossly out of equilibrium: foreign reserves were high, the real exchange rate was sufficiently undervalued to provide a reasonable margin of safety, and real wages had already fallen sufficiently in previous years to be compatible with a substantially devalued exchange rate. On the other hand, the long-run costs of a rigid relative price structure are well known. In Mexico, the Government had managed to avoid explicit wage indexation, exploiting instead its ability to negotiate centralized wage settlements on a discrete basis. <sup>1/</sup> Having gone that far, the Government rightly attempted to retain wage flexibility. Also, as demonstrated at end-1987, the very substantial, and largely unavoidable, degree of financial openness in Mexico implies that confidence-induced demand shifts from domestic to foreign assets can have a direct and very large impact on inflation through largely self-fulfilling movements in the exchange rate. <sup>2/</sup> In this context, indexation could give rise to very sharp upward swings in inflation, which may be difficult to revert, in particular if wage indexation is of the *ex post* variety. <sup>3/</sup> Finally, as will be argued below, Mexico would greatly benefit from strengthening its trade relations with the United States, its main economic partner, particularly if a free-trade North American zone is established. A steadier currency, which would, perhaps, be able to join at some point a North American equivalent of the European Monetary System (EMS), would then facilitate that objective.

It is too soon to tell whether the current stabilization effort will be successful. Results attained so far are encouraging, with inflation falling from 15 percent a month to less than 1 percent in just seven months, without a general freeze on prices. The coming months, however, will be crucial in determining whether Mexico can return, in the near future, to the low inflation growth it had enjoyed during the stabilizing development era.

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<sup>1/</sup> The desire to keep this option open is, in fact, probably what mostly prevented the Government from introducing indexed financial instruments or from preannouncing specific adjustment rules for the exchange rate after 1982.

<sup>2/</sup> On self-fulfilling inflationary outbursts and the role of exchange rates, see recent contributions by Calvo (1988) and Obstfeld (1988).

<sup>3/</sup> The recent Brazilian experience, with shifts out of indexed domestic assets in the presence of rising inflation, seem, on the other hand, to indicate that indexation of financial instruments is no guarantee against shifts in asset demands, particularly if these assets are of a very short-run maturity.

## 2. Debt or trade?

Assuming that a satisfactory and stable sector of relative prices can be reached, another crucial factor in creating a favorable investment climate is the reduction of the residual uncertainty surrounding the debt and trade issues. For expositional purposes, the future of trade and debt negotiations can be visualized along two alternative extreme paths. At one end of the spectrum, Mexico could bargain for substantial debt concessions while maintaining a relatively well protected economy, under the assumption that a steadier inflow of net foreign financial resources is the critical missing element to sustain the continuation of the import substitution process and the emergence of a locally based export-oriented manufacturing capacity. At the other extreme, Mexico could favor trade over debt concessions while opening up its economy--under the assumption that the local industrial base is already sufficient to allow for a rapid integration into world trade--without running the risk of falling into the trap of a low-wage in-bond type of industrial development. After choosing the first option for several decades, Mexico seemed to lean toward the second option during the last administration. The forthcoming administration will be quickly pressed to define its position on this key issue.

A comprehensive discussion of the pros and cons of each of the two options is a difficult task, and is outside the scope of this paper. A point that must be emphasized, however, is that while pressures have been building up inside Mexico and within industrial countries to renegotiate the debt problem in a lasting way, Mexico may have specific interests in maintaining a close linkage between trade and debt negotiations, particularly with the United States. The potential for further trade development between the two countries is likely to be large, in spite of the fact that the United States already takes the lion's share of Mexican trade. Mexico's comparatively cheap labor, both skilled and unskilled, and its abundant natural resources and geographical location in relation to the United States provide a natural complement to the U.S. economy that, until recently, has been barely exploited. Furthermore, a rapid development of U.S.-Mexico trade based on bilateral trade agreements is not necessarily inconsistent with a parallel increase in trade with other countries, as the former should boost Mexico's ability to compete in world trade. So far, most of the recent trade liberalization efforts have been made unilaterally by Mexico. It now seems appropriate for Mexico to capitalize on its changing attitudes. The recent signing of the U.S.-Canada free trade agreement provides a unique opportunity for launching a bold agenda toward the creation of what could perhaps become a free North American trade zone. This would give a powerful boost to investment in Mexico, and allay existing fears of protectionism by the United States. Most important, it would restrict remaining uncertainties on the Mexican side about future commercial and exchange rate policies, and would clearly signal a path of economic development in Mexico, which should go a long way toward reassuring Mexican and foreign investors. Furthermore, by promoting trade and reinforcing economic ties between Mexico and its

main creditors, it should have a potent beneficial impact on the debt issue, as both the ability to repay the debt and the penalty associated with a default would sharply increase. In contrast, a policy on the Mexican side that would emphasize solely the debt issue without reinforcing trade relations could run the risk of slowing down Mexico's structural adjustment, and lessening, instead of reinforcing, Mexico's economic integration with the rest of the world.

### 3. Financial re-intermediation

A reversal of the process of financial disintermediation is another precondition for sustainable growth. Given the size of the September crash, it may take a long time for the stock market to recover enough strength to represent a significant alternative channel of financial intermediation within the private sector. <sup>1/</sup> It is thus likely that, in the next few years, banks will again need to assume most of the intermediation. For that purpose, they must offer sufficiently attractive instruments. Two issues seem to deserve particular attention.

The first is deposit rates. As indicated earlier and as shown in Charts 10 and 11, real deposit rates in the last five years have been rather low on the average and quite unstable. The monetary authorities have adjusted these rates rather sluggishly on the basis of trend-expected inflation, so as to avoid strong fluctuations in nominal rates while maintaining the average real rates at zero or very slightly above. In the absence of explicit indexation, however, a policy of maintaining higher and more variable nominal rates could run into implementation difficulties, as higher rates may hamper investment and complicate fiscal management, while high nominal variability can confuse depositors. This is particularly true during times of high uncertainty about future inflation and exchange rates, as during the execution of the Solidarity Pact, with ex post real rates above 30 percent. Indexed instruments can reduce the variance of expected returns and, hence, lower the ex ante premium on the cost of funds. In the context of a stabilization program, they can substantially reduce the cost of funds under the hypothesis of success, while still providing adequate coverage if the program fails. The authorities' lack of willingness to experiment again with indexed instruments has probably been largely a reflection of the need to maintain wage flexibility, although it may also have been influenced, to some extent, by the negative memory left by the undoing of the "mexdollar" system in August 1982. <sup>2/</sup> If

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<sup>1/</sup> Most of the current activity of brokerage houses in Mexico involves government paper rather than private instruments.

<sup>2/</sup> Some indexed government bonds were introduced in mid-1986, but the index used so far has been the controlled exchange rate, which has limited their attractiveness.



stabilization succeeds, interest rate management will, of course, become much easier. However, if it does not fully succeed, the option of allowing banks again to issue indexed instruments would have to be given serious consideration. 1/

Another key issue in financial intermediation is capital controls and financial openness. There are, in turn, two sides to this issue: on the one hand, the accessibility of foreign financial instruments to the Mexican public, and, on the other, the accessibility of the Mexican market to foreign financial intermediaries. Until 1982, the Mexican monetary authorities traditionally followed a policy of complete exchange convertibility. Increasing capital flight finally forced them to institute capital controls in 1982. Commercial banks were initially asked to withdraw completely from the exchange market. However, in view of the rapid proliferation of an inefficient parallel market and of exchange houses north of the border, the Government was induced to switch to a dual exchange market. This system has probably functioned adequately as a temporary shock absorber to moderate the immediate real impact of speculative attacks. Given, however, the size of the U.S.-Mexico border, large spreads cannot be maintained for long, as they rapidly induce a transfer of commercial transactions from the commercial exchange market to the financial market. The authorities have thus been forced, in practice, to let the commercial rate adjust relatively rapidly to follow the financial rate.

Foreign banks, on the other hand, had traditionally restricted their participation in the Mexican loan market to dollar transactions. After the crisis, foreign banks started to re-lend excess pesos in Mexico from their exchange transactions north of the border. Banco de México prohibited the recycling of these pesos at end-1985, partly because of difficulties that arose in monetary control and partly to protect Mexican banks from unfair competition, since foreign banks' operations were not subject to Mexican reserve requirements.

How extensive capital controls and financial openness should be in the near future remains an unsettled and difficult issue. Arguments in favor of maintaining barriers to financial transactions are well known. In Mexico, financial openness, combined with fairly short

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1/ It is not clear, however, whether the index should be the exchange rate or the price level. The former would clearly provide more effective coverage against the risk of a sudden devaluation. However, the dollarization of the domestic financial system has several drawbacks, which were clearly brought into evidence in 1982. In particular, if the public loses confidence in domestic dollar-denominated instruments, movements in the exchange rate do not provide a strong insulating mechanism against further speculation, as they do not directly affect the comparative expected return of actual and virtual dollars. Relatively long maturities and temporary freezes of dollar deposits in cases of panics could be alternative ways to deal with this issue.

maturities, has added an undesirable element of instability to the delicate context of an in-depth structural adjustment. Furthermore, as shown at end-1987, speculative capital outflows have occurred without any significant disequilibrium in underlying fundamentals. On the other hand, capital controls have not proven to be practicable in Mexico, a situation that may be alterable only at great cost. The losses inflicted on financial investors in 1982 and the prevailing uncertainty about expected financial returns tend to suggest also that an attempt to reinforce capital controls would raise fears of financial repression and lead to capital outflows. <sup>1/</sup> It may thus be preferable to maintain current convertibility as it is.

In the opposite direction, the possibility of recycling flight capital inside the country through foreign banking intermediation deserves some attention. It could have a positive impact on overall financial intermediation and could increase the overall efficiency of the banking system. The risks, however, are probably significant. On the one hand, excessive pressure on Mexican banks could be exerted, owing to the currently depressed conditions of financial markets. On the other, a greater degree of financial liberalization may be required, particularly concerning the type of instruments sold to the public and the determination of interest rates. In a situation of general macroeconomic uncertainty, financial liberalization can easily become destabilizing. Therefore, financial liberalization should proceed cautiously as long as the overall economic situation remains volatile.

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<sup>1/</sup> A discussion of linkages between capital flight, fiscal strength, and capital controls can be found in Ize (1987).

A. Inflationary Accounting and Corrections for Valuation Changes

Real flows on peso-denominated assets and liabilities for year  $t$  were computed by adjusting end-December stocks for year  $t-1$  by the change in CPI, December to December, and then dividing the adjusted nominal flow by year  $t$  GDP, or

$$\Delta a_t = (A_t - \frac{P_t}{P_{t-1}} A_{t-1}) / Y_t \quad (A-1)$$

where  $\Delta a$  is the real flow;  $A$ , the end-December stocks;  $P$ , the end-December CPI; and  $Y$ , the nominal GDP. The inflation tax, which is consistent with this deflation procedure, is then

$$\pi_t = A_{t-1} \left( \frac{P_t - P_{t-1}}{P_{t-1}} \right) / Y_t \quad (A-2)$$

The net inflation tax for the public sector was computed by applying (A-2) to the sum of peso-denominated credit given by the banking system to the public sector and bonds directly sold to the public, and then subtracting domestic interest payments. The latter, in turn, were obtained by subtracting interest paid abroad (as obtained from balance of payments statistics) 1/ from total public sector interest payments (as given by the fiscal accounts). The inflation tax on money was computed by applying (A-2) to M1 balances, adjusted for the average reserve ratio, as given in Gil Díaz and Ramos Tercero (1987). Real interest payments on interest-bearing domestic debt were obtained by netting out from the total net inflation tax the inflation tax on money balances.

Real flows of dollar-denominated assets and liabilities were computed by converting back into dollars end-December stock figures expressed in pesos, at the end-December financial exchange rate as given by Banco de México. The average dollar flow was then converted back into pesos at the average financial exchange rate for the year, before being deflated by nominal GDP.

B. Profit margin index

The index is defined as

$$\rho = \frac{(\alpha + \beta + \gamma) P}{\alpha W + \beta E + \gamma I}$$

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1/ Interest paid by development banks was imported to the public sector.

where P is the wholesale price index; W, the average manufacturing wage; E, the controlled exchange rate; and I, the price of energy as an input in production, obtained from published Banco de México statistics until December 1983, and, from then on, defined as a weighted average of industrial electricity and gasoline prices.  $\alpha$  was obtained as the average ratio of wage payments to GDP in the National Accounts during 1980-87.  $\beta$  is the average ratio of intermediate and capital imports to GDP during the same period. Finally,  $\gamma$  was obtained from sales statistics of CFE and PEMEX to the production sector. The index was standardized to equal one in January 1980.

### C. Price and output simulations

The following equations were estimated with monthly data over the period May 1980-December 1987:

$$P_t = 0.202 + 0.088 P_{t-1} + 0.123E_t + 0.00071F_{t-4} \quad H = 1.02$$

(6.0)      (55.7)              (8.2)              (3.5)

$$Y_t = 1.067 + 0.80Y_{t-1} + 0.0054F_t - 0.033D_t \quad H = -0.54$$

(3.8)      (15.1)              (3.1)              (-3.0)               $\rho = -0.446$

P is the wholesale price index; Y, the index of industrial production; E, the controlled exchange rate; F, an aggregate demand index obtained as a four-month moving average of the sum of the domestic part of the primary public sector deficit <sup>1/</sup> and the net real flow of credit given by the banking system to the private sector; and D, a December seasonal dummy. P, Y, and E are taken in lags. Values between parentheses are t-statistics. The output equation had to be corrected for autocorrelation using the Cochran-Orcutt technique.

The constant real exchange rate simulation was obtained by maintaining the real exchange rate at its December 1982 level from that date on. The constant demand simulation was obtained by setting  $F = 0$  from January 1983 on. Given the actual observed values of F during this period, this implies a less expansionary policy in 1984-85 but a relatively more expansionary policy in 1986.

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<sup>1/</sup> The domestic primary public deficit is defined as the primary deficit, net of PEMEX export revenue.

Table 1. Savings-Investment Identity  
(Ratios to GDP - Average of Yearly Observations)

|                           | GDO         | LEA         | JLP         | MMH         |
|---------------------------|-------------|-------------|-------------|-------------|
| Total savings             | <u>21.3</u> | <u>21.8</u> | <u>25.1</u> | <u>19.7</u> |
| External savings          | 2.9         | 3.7         | 3.1         | -1.4        |
| Foreign capital inflows   | (2.9)       | (4.8)       | (5.4)       | (1.9)       |
| Domestic capital outflows | (--)        | (-1.1)      | (-2.3)      | (-3.3)      |
| Banking system            | /-0.2/      | /-0.1/      | /0.1/       | /-1.7/      |
| Private sector            | /0.1/       | /-1.0/      | /-2.4/      | /-1.6/      |
| Domestic savings          | 18.4        | 18.1        | 22.1        | 21.1        |
| Public                    | (3.7)       | (3.0)       | (5.0)       | (7.7)       |
| PEMEX <sup>1/</sup>       | /0.8/       | /1.1/       | /4.5/       | /9.6/       |
| Other                     | /2.9/       | /1.9/       | /0.5/       | /-1.9/      |
| Private                   | (14.8)      | (15.2)      | (17.0)      | (13.4)      |
| Total investment          | <u>21.3</u> | <u>21.8</u> | <u>25.1</u> | <u>19.7</u> |
| Public                    | <u>5.2</u>  | <u>7.0</u>  | <u>9.7</u>  | <u>6.1</u>  |
| Private                   | 15.7        | 14.9        | 15.4        | 13.6        |

Sources: Indicadores Económicos, Banco de México; and Estadísticas Hacendarias del Sector Público, 1965-1982, Secretaría de Hacienda y Crédito Público.

<sup>1/</sup> Includes the domestic tax on gasoline.

Table 2. Public Sector Overall Budget Restriction  
(Ratios to GDP - Average of Yearly Observations)

|                               | GDO         | LEA         | JLP         | MMH         |
|-------------------------------|-------------|-------------|-------------|-------------|
| Revenue                       | <u>19.0</u> | <u>20.9</u> | <u>27.0</u> | <u>31.5</u> |
| Federal Government            | <u>8.9</u>  | <u>9.5</u>  | <u>11.2</u> | <u>9.9</u>  |
| PEMEX                         | <u>3.3</u>  | <u>3.3</u>  | <u>7.3</u>  | <u>13.2</u> |
| Other                         | <u>6.8</u>  | <u>8.1</u>  | <u>8.5</u>  | <u>8.4</u>  |
| Expenditure                   | <u>20.8</u> | <u>24.8</u> | <u>31.7</u> | <u>29.9</u> |
| Current noninterest           | <u>14.4</u> | <u>17.6</u> | <u>21.4</u> | <u>21.6</u> |
| Interest (real)               | <u>1.0</u>  | <u>0.3</u>  | <u>0.2</u>  | <u>2.0</u>  |
| Capital                       | <u>5.3</u>  | <u>6.9</u>  | <u>9.9</u>  | <u>6.2</u>  |
| Operational balance (deficit) | <u>-1.8</u> | <u>-3.9</u> | <u>-4.7</u> | <u>1.6</u>  |
| On-lending                    | <u>0.2</u>  | <u>1.1</u>  | <u>1.2</u>  | <u>1.1</u>  |
| Financing                     | <u>3.1</u>  | <u>3.9</u>  | <u>7.0</u>  | <u>-0.4</u> |
| Statistical discrepancy       | <u>1.1</u>  | <u>-1.1</u> | <u>1.1</u>  | <u>0.2</u>  |

Sources: Indicadores Económicos. Banco de México; and Estadísticas Hacendarias del Sector Público, 1965-1982, Secretaría de Hacienda y Crédito Público.

Table 3. Public Sector Overall Balances  
(Ratios to GDP - Average of Yearly Observations)

|  | GDO         | LEA         | JLP          | MMH          |
|--|-------------|-------------|--------------|--------------|
| Conventional balance (deficit) <u>1/</u> | <u>-2.3</u> | <u>-6.9</u> | <u>-10.1</u> | <u>-12.0</u> |
| Operational balance (deficit) <u>1/</u>  | <u>-2.0</u> | <u>-5.0</u> | <u>-5.9</u>  | <u>0.5</u>   |
| Primary balance (deficit) <u>1/</u>      | <u>-0.8</u> | <u>-4.7</u> | <u>-5.5</u>  | <u>2.5</u>   |
| Federal Government                       | <u>0.9</u>  | <u>0.1</u>  | <u>-2.9</u>  | <u>-2.7</u>  |
| PEMEX                                    | <u>0.4</u>  | <u>0.2</u>  | <u>2.2</u>   | <u>9.5</u>   |
| Other                                    | <u>-2.1</u> | <u>-3.9</u> | <u>-3.6</u>  | <u>-3.2</u>  |
| On-lending                               | <u>-0.2</u> | <u>-1.1</u> | <u>-1.2</u>  | <u>-1.1</u>  |

Sources: Indicadores Económicos, Banco de México; and Estadísticas Hacendarias del Sector Público, 1965-1982, Secretaría de Hacienda y Crédito Público.

1/ Includes on-lending.

Table 4. Public Sector Noninterest Current Spending

(Ratios to GDP - Average of Yearly Observations)

|                                       | GDO         | LEA         | JLP         | MMH         |
|---------------------------------------|-------------|-------------|-------------|-------------|
| Total noninterest current expenditure | <u>14.6</u> | <u>17.6</u> | <u>21.4</u> | <u>21.6</u> |
| Goods and services                    | 12.9        | 14.9        | 15.7        | 15.3        |
| Wages                                 | (5.8)       | (6.6)       | (7.9)       | (6.6)       |
| Federal Government                    | /2.8/       | /3.0/       | /4.0/       | /3.2/       |
| PEMEX                                 | /0.9/       | /0.8/       | /0.6/       | /0.6/       |
| Other                                 | /2.1/       | /2.9/       | /3.3/       | /2.7/       |
| Other expenditure                     | (7.1)       | (8.3)       | (8.2)       | (9.1)       |
| Federal Government                    | /1.1/       | /1.2/       | /1.3/       | /1.3/       |
| PEMEX                                 | /1.4/       | /1.3/       | /1.6/       | /1.7/       |
| Other                                 | /4.6/       | /5.9/       | /5.4/       | /6.1/       |
| Transfers                             | 1.5         | 2.6         | 4.7         | 5.5         |
| Exchange losses                       | 0.0         | 0.0         | 0.7         | 0.5         |

Sources: Indicadores Económicos. Banco de México; and Estadísticas Hacendarias del Sector Público, 1965-1982, Secretaría de Hacienda y Crédito Público.



Table 5. Public Sector Interest Expenditure  
(Ratios to GDP - Average of Yearly Observations)

|                            | GDO        | LEA        | JLP        | MMH        |
|----------------------------|------------|------------|------------|------------|
| Total interest expenditure | <u>1.0</u> | <u>0.3</u> | <u>0.2</u> | <u>2.0</u> |
| Domestic real interest     | 0.3        | -0.7       | -2.4       | -2.7       |
| Interest-bearing debt      | (0.4)      | (-0.1)     | (-1.1)     | (-0.3)     |
| Nominal interest           | /0.6/      | /1.2/      | /1.9/      | /9.8/      |
| Inflation tax              | /-0.2/     | /-1.3/     | /-2.9/     | /-10.1/    |
| Inflation tax on money     | (-0.1)     | (-0.6)     | (-1.3)     | (-2.4)     |
| Foreign interest           | 0.7        | 1.0        | 2.6        | 4.7        |

Sources: Indicadores Económicos, Banco de México; and Estadísticas Hacendarias del Sector Público, 1965-1982, Secretaría de Hacienda y Crédito Público.

Table 6. Public Sector Capital Expenditure  
(Ratios to GDP - Average of Yearly Observations)

|                              | GDO        | LEA        | JLP        | MMH        |
|------------------------------|------------|------------|------------|------------|
| Capital expenditure          | <u>5.3</u> | <u>6.9</u> | <u>9.9</u> | <u>6.2</u> |
| Federal Government <u>1/</u> | 2.6        | 2.7        | 3.3        | 2.1        |
| PEMEX                        | 0.5        | 1.0        | 2.9        | 1.4        |
| Other                        | 2.3        | 3.2        | 3.5        | 2.6        |

Sources: Indicadores Económicos, Banco de México; and Estadísticas Hacendarias del Sector Público, 1965-1982, Secretaría de Hacienda y Crédito Público.

1/ Includes capital transfers to entities outside the public sector.

Table 7. Public Sector Financing  
(Ratios to GDP - Average of Yearly Observations)

|                   | GDO        | LEA        | JLP        | MMH         |
|-------------------|------------|------------|------------|-------------|
| Total financing   | <u>3.1</u> | <u>3.9</u> | <u>7.0</u> | <u>-0.4</u> |
| Domestic          | 1.7        | 0.7        | 3.1        | -2.4        |
| Banks             | (1.7)      | (0.7)      | (2.7)      | (-3.1)      |
| Pesos             | /1.5/      | /0.9/      | /2.2/      | /-2.3/      |
| Dollars           | /0.2/      | /-0.2/     | /0.5/      | /-0.8/      |
| Nonbank (pesos)   | (--)       | (--)       | (0.4)      | (0.8)       |
| Foreign (dollars) | 1.4        | 3.2        | 3.9        | 2.0         |
| Intermediated     | (0.8)      | (1.9)      | (1.3)      | (1.3)       |
| Direct            | (0.6)      | (1.2)      | (2.6)      | (0.7)       |

Sources: Indicadores Económicos, Banco de México; and Estadísticas Hacendarias del Sector Público, 1965-1982, Secretaría de Hacienda y Crédito Público.

Table 8. Private Sector Budget Restriction  
(Ratios to GDP - Average of Yearly Observations)

|   | GDO          | LEA          | JLP          | MMH          |
|---|--------------|--------------|--------------|--------------|
| GDP   | <u>100.0</u> | <u>100.0</u> | <u>100.0</u> | <u>100.0</u> |
| - Taxes and transfers   | -11.0        | -11.6        | -11.1        | -7.4         |
| - Public enterprises surplus                                      | -0.9         | -1.1         | -5.2         | -11.3        |
| + Net domestic interest income <u>1/</u>                          | 0.3          | -0.7         | -2.4         | -2.7         |
| - Net foreign interest payments                                   | -1.2         | -1.1         | -0.7         | -0.9         |
| = Disposable income   | <u>87.2</u>  | <u>85.5</u>  | <u>80.5</u>  | <u>77.7</u>  |
| - Consumption   | -72.4        | -70.3        | -63.5        | -64.2        |
| = Savings   | <u>14.8</u>  | <u>15.2</u>  | <u>17.0</u>  | <u>13.5</u>  |
| - Investment  | -15.7        | -14.9        | -15.4        | -13.7        |
| = Financial savings   | <u>1.0</u>   | <u>0.3</u>   | <u>1.6</u>   | <u>-0.2</u>  |
| Net accumululation of financial assets                            | <u>0.2</u>   | <u>-0.3</u>  | <u>3.2</u>   | <u>0.7</u>   |
| Assets  | <u>3.8</u>   | <u>2.5</u>   | <u>5.5</u>   | <u>0.2</u>   |
| Domestic <u>2/</u>  | (3.9)        | (1.5)        | (3.1)        | (-1.5)       |
| Foreign   | (-0.1)       | (1.0)        | (2.4)        | (1.6)        |
| Liabilities   | 3.5          | 2.8          | 2.3          | -0.7         |
| Domestic <u>2/</u>  | (2.5)        | (1.4)        | (1.4)        | (-0.1)       |
| Foreign   | (1.0)        | (1.4)        | (0.9)        | (-0.6)       |
| Statistical discrepancy   | <u>-1.2</u>  | <u>0.5</u>   | <u>-1.5</u>  | <u>-0.9</u>  |
| Memorandum item: Consumption as a proportion of disposable income | 0.83         | 0.82         | 0.79         | 0.83         |

Sources: Indicadores Económicos, Banco de México; and Estadísticas Hacendarias del Sector Público, 1965-1982, Secretaría de Hacienda y Crédito Público.

1/ Includes the inflation tax.

2/ Does not include private stocks; includes on-lending.

Table 9. Functional Breakdown of Private Disposable Income

(Average of Yearly Observations)

|   | GDO          | LEA          | JLP          | MMH          |
|---|--------------|--------------|--------------|--------------|
| <u>(As a percentage of GDP)</u>               |              |              |              |              |
| Disposable income                             | <u>87.2</u>  | <u>85.5</u>  | <u>80.7</u>  | <u>77.7</u>  |
| Wages (National Accounts)                     | <u>33.7</u>  | <u>35.6</u>  | <u>37.7</u>  | <u>25.1</u>  |
| Profits                                       | 53.4         | 49.8         | 43.0         | 52.5         |
| Disposable income                             | <u>87.2</u>  | <u>85.5</u>  | <u>80.7</u>  | <u>77.7</u>  |
| Wages (corrected for informal sector)         | 33.7         | 35.6         | 37.7         | 29.3         |
| Profits                                       | 53.4         | 49.8         | 43.0         | 48.4         |
| <u>(As a percentage of disposable income)</u> |              |              |              |              |
| Disposable income                             | <u>100.0</u> | <u>100.0</u> | <u>100.0</u> | <u>100.0</u> |
| Wages   | <u>38.7</u>  | <u>41.7</u>  | <u>46.7</u>  | <u>32.4</u>  |
| Profits                                       | 61.3         | 58.3         | 53.3         | 67.6         |

Source: Sistema de Cuentas Nacionales, Secretaría de Programación y Presupuesto.

Table 10. Financial Intermediation Matrix  
(In ratios to GDP - average of yearly observations)

| CREDITORS                    | DEBTORS        |               |               |               |               |             |             |            |                |            |            |            |                |            |            |             | Total              |            |            |            |
|------------------------------|----------------|---------------|---------------|---------------|---------------|-------------|-------------|------------|----------------|------------|------------|------------|----------------|------------|------------|-------------|--------------------|------------|------------|------------|
|                              | Private Sector |               |               |               | Public Sector |             |             |            | Domestic Banks |            |            |            | Foreign Sector |            |            |             | Asset Accumulation |            |            |            |
|                              | GDO            | LEA           | JLP           | MMH           | GDO           | LEA         | JLP         | MMH        | GDO            | LEA        | JLP        | MMH        | GDO            | LEA        | JLP        | MMH         | GDO                | LEA        | JLP        | MMH        |
| Private sector               | 0.0            | 0.0           | 0.0           | 0.9           | 0.0           | 0.0         | 0.4         | 0.8        | 3.9            | 1.5        | 2.7        | -2.3       | -0.1           | 1.0        | 2.4        | 1.6         | 3.8                | 2.5        | 5.5        | 1.0        |
| Domestic banks               | 2.4 <u>1/</u>  | 1.4 <u>1/</u> | 0.4 <u>1/</u> | 0.2 <u>1/</u> | 1.3           | 0.8         | 2.7         | -3.2       |                |            |            |            | 0.2            | 0.1        | -0.1       | 1.7         | 3.9                | 2.1        | 3.0        | -1.3       |
| Foreign sector               | 1.1            | 1.4           | 1.9           | -0.7          | 1.4           | 3.2         | 3.9         | 2.0        |                |            |            |            |                |            |            |             | 2.5                | 4.6        | 5.8        | 1.3        |
| Total liability accumulation | 3.5            | 2.8           | 2.3           | 0.4           | 2.7           | 4.0         | 7.0         | -0.4       | 3.9            | 1.5        | 3.7        | -2.3       | 0.1            | 1.1        | 2.3        | 3.3         |                    |            |            |            |
| Net asset accumulation       | <u>0.3</u>     | <u>-0.3</u>   | <u>3.2</u>    | <u>0.6</u>    | <u>-2.7</u>   | <u>-4.0</u> | <u>-7.0</u> | <u>0.4</u> | <u>0.0</u>     | <u>0.6</u> | <u>0.3</u> | <u>1.0</u> | <u>2.4</u>     | <u>3.5</u> | <u>3.5</u> | <u>-2.0</u> | <u>0.0</u>         | <u>0.0</u> | <u>0.0</u> | <u>0.0</u> |

Sources: Indicadores Económicos, Banco de México and Estadísticas Hacendarias del Sector Público 1965-1982, Secretaría de Hacienda y Crédito Público.

1/ Includes on-lending by the public sector.

Table 11. Average Interest Rates on Three Months' Time Deposits

|  | GDO  | LEA  | JLP   | MMH   |
|--|------|------|-------|-------|
| Compounded nominal interest rate               | 10.6 | 11.3 | 27.1  | 100.6 |
| Real deposit rate (deflated by CPI)            |      |      |       |       |
| Including years of jump devaluations           | 7.1  | -3.8 | -6.8  | 0.0   |
| Excluding years of jump devaluations <u>1/</u> | 7.1  | -1.6 | -0.9  | 0.0   |
| Interest rate differential/United States       |      |      |       |       |
| Including years of jump devaluations           | 4.3  | -6.1 | -66.5 | 5.7   |
| Excluding years of jump devaluations <u>1/</u> | 4.3  | 3.7  | 6.4   | 5.7   |

Source: Indicadores Económicos, Banco de México.

1/ 1976 and 1982 are excluded.

Table 12. Notation for the Growth Model

|          |   |  |
|----------|---|--|
| $Y$      | = | GDP  |
| $C_P$    | = | Private consumption                                      |
| $C_G$    | = | Public consumption                                       |
| $I_P$    | = | Private investment                                       |
| $I_G$    | = | Public investment  |
| $Z$      | = | Trade deficit  |
| $r^H$    | = | Nominal domestic interest rate                           |
| $r^F$    | = | Nominal foreign interest rate                            |
| $E$      | = | Nominal exchange rate                                    |
| $T$      | = | Tax revenue  |
| $T^F$    | = | Net transfers from abroad to the private sector          |
| $B_G^H$  | = | Public domestic debt (including money)                   |
| $B_G^F$  | = | Public foreign debt                                      |
| $B_P^F$  | = | Private foreign debt (net of private assets held abroad) |
| $\rho$   | = | Rate of nominal depreciation                             |
| $\pi$    | = | Rate of domestic inflation                               |
| $g$      | = | Rate of real GDP growth                                  |
| $d_G$    | = | Current fiscal deficit                                   |
| $d^F$    | = | Current account deficit                                  |
| $\alpha$ | = | Propensity to consume                                    |
| $\beta$  | = | Incremental capital output ratio                         |
| $y_d$    | = | Private disposable income                                |
| $s_G$    | = | Seigniorage on public debt                               |
| $s^G$    | = | Seigniorage on external debt                             |



Table 13. Incremental Capital-Output Ratios

|   | 1965-72 | 1973-76 | 1977-81 | 1980-81 | 1984-85-86 |
|---|---------|---------|---------|---------|------------|
| Gross aggregate investment<br>(National Accounts) | 1.7     | 1.9     | 1.81    |         | 2.3        |
| Investment volume index                           |         |         | 1.9     |         | 2.0        |
| Machinery index                                   |         |         |         | 2.0     | 1.7        |

Table 14. Average Propensity to Save

|                    | 1965-72 | 1973-76 | 1977-81 | 1983-87 | 1984-85 |
|--------------------|---------|---------|---------|---------|---------|
| Propensity to save | 16.9    | 17.7    | 21.1    | 17.3    | 19.7    |

Table 15. Base Growth Simulations

|                         | Historical Averages |         | Base<br>Scenario | Alternative Oil Price |        |        | Higher Foreign<br>Interest | Lower ICOR |
|-------------------------|---------------------|---------|------------------|-----------------------|--------|--------|----------------------------|------------|
|                         | MMH                 | 1986-87 |                  | (a)                   | (b)    | (c)    | (d)                        | (e)        |
| Resource balance        |                     |         |                  |                       |        |        |                            |            |
| Current account deficit | -1.4                | 0.6     | -1.4             | -1.4                  | -1.4   | -1.4   | -1.4                       | -1.4       |
| Public sector surplus   | 1.6                 | 1.6     | -3.3             | -4.9                  | 1.8    | -1.9   | -4.3                       | -3.2       |
| Savings                 | (7.7)               | (7.2)   | (4.2)            | (2.6)                 | (9.3)  | (5.6)  | (3.2)                      | (4.3)      |
| Investment              | (6.1)               | (5.6)   | (7.5)            | (7.5)                 | (7.5)  | (7.5)  | (7.5)                      | (7.5)      |
| Private sector surplus  | -0.2                | -1.0    | 4.7              | 6.3                   | -0.4   | 3.3    | 5.7                        | 4.6        |
| Savings                 | (13.4)              | (11.4)  | (14.9)           | (15.3)                | (13.5) | (14.5) | (14.8)                     | (14.9)     |
| Investment              | (13.6)              | (12.4)  | (10.2)           | (9.0)                 | (13.9) | (11.2) | (9.1)                      | (10.3)     |
| Parameters              |                     |         |                  |                       |        |        |                            |            |
| Growth                  | -0.4                | -1.6    | 2.6              | 2.0                   | 4.5    | 3.1    | 2.1                        | 3.5        |
| Inflation               | 83.5                | 105.0   | 3.0              | 3.0                   | 3.0    | 3.0    | 3.0                        | 3.0        |
| Solvency constraints    |                     |         |                  |                       |        |        |                            |            |
| Public                  | -8.4                | -9.5    | 0.0              | -1.6                  | 7.0    | 2.2    | -0.9                       | 1.3        |
| External                | -11.4               | -11.1   | 3.6              | 3.3                   | 5.0    | 4.1    | 3.3                        | 4.4        |

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47  
1

Table 16. Alternative Adjustment Mechanisms

|                         | <u>Base<br/>Scenario</u> | <u>Fiscal<br/>Adjustment</u><br>(a) | <u>Fiscal Adjustment and Larger External Resources</u> |        |        |
|-------------------------|--------------------------|-------------------------------------|--|--------|--------|
|                         |                          |                                     | (b)  | (c)    | (d)    |
| Resource balance        |                          |                                     |  |        |        |
| Current account deficit | -1.4                     | -1.4                                | 2.5  | -1.4   | 0.2    |
| Public sector surplus   | -3.3                     | 0.7                                 | 0.7  | 2.9    | 2.9    |
| Savings                 | (4.2)                    | (8.2)                               | (8.2)  | (10.4) | (10.4) |
| Investment              | (7.5)                    | (7.5)                               | (7.5)  | (7.5)  | (7.5)  |
| Private sector surplus  | 4.7                      | 0.7                                 | -4.2   | -1.5   | -3.1   |
| Savings                 | (14.9)                   | (14.3)                              | (14.3)   | (14.1) | (14.1) |
| Investment              | (10.2)                   | (13.6)                              | (17.5)   | (15.6) | (17.2) |
| Parameters              |                          |                                     |  |        |        |
| Growth                  | 2.6                      | 4.4                                 | 6.3  | 5.3    | 6.1    |
| Inflation               | 3.0                      | 3.0                                 | 3.0  | 3.0    | 3.0    |
| Solvency constraints    |                          |                                     |  |        |        |
| Public                  | 0.0                      | 6.1                                 | 7.5  | 6.6    | 7.0    |
| External                | 3.6                      | 5.2                                 | 2.4  | 3.4    | 3.7    |

Table 17. Composition of General Government Tax Revenue, 1983

(As a proportion of GDP)

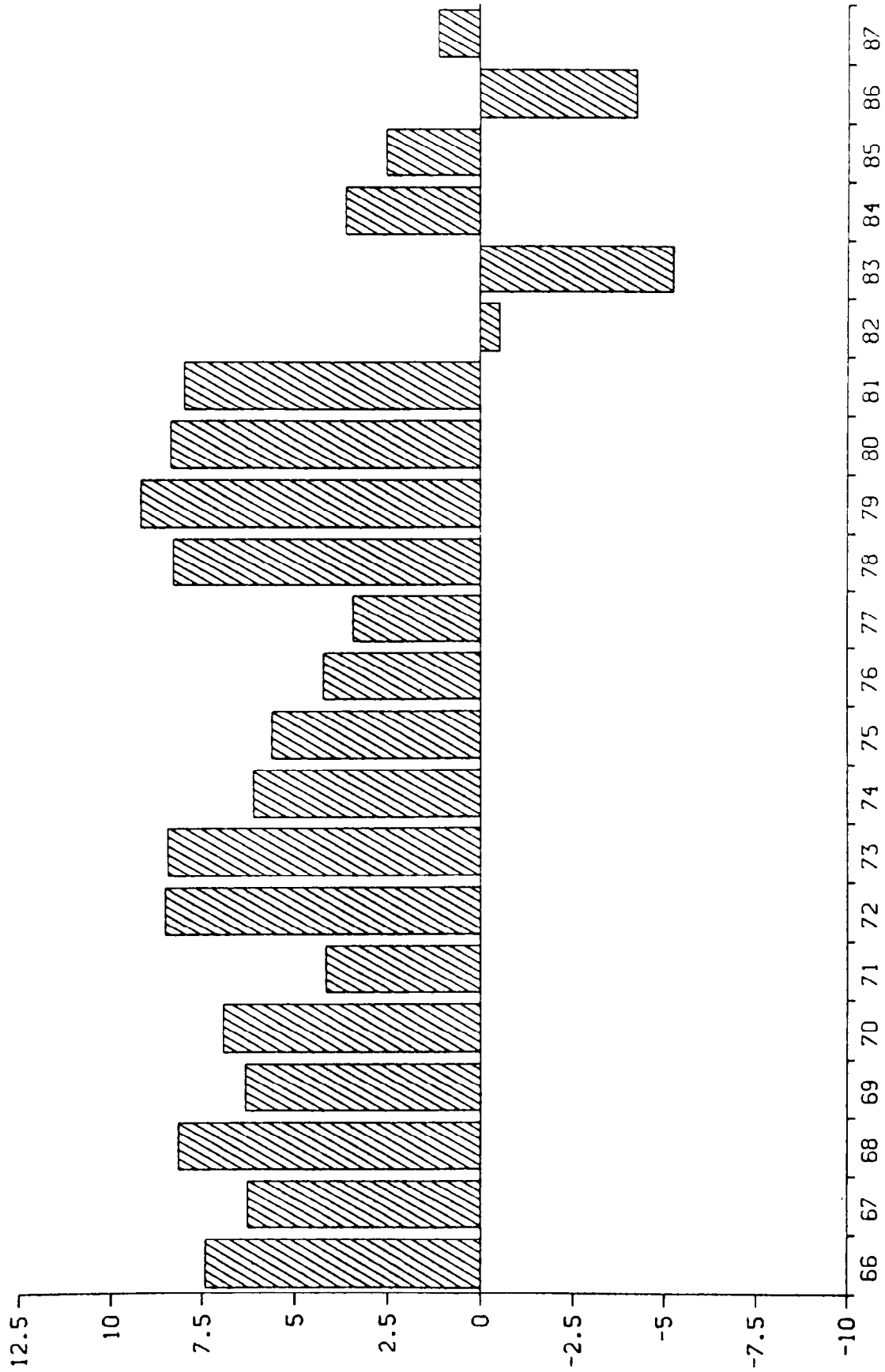
|                             | Mexico | Chile | Brazil | Developing<br>Countries | Industrial<br>Countries |
|-----------------------------|--------|-------|--------|-------------------------|-------------------------|
| Total tax revenue <u>1/</u> | 17.6   | 20.3  | 17.8   | 18.2                    | 23.3                    |
| Direct taxes                | 4.2    | 3.9   | 3.8    | 5.4                     | 13.1                    |
| Indirect taxes              | 11.9   | 11.8  | 11.4   | 8.8                     | 7.4                     |
| Petroleum                   | (7.2)  | (...) | (1.9)  | (...)                   | (...)                   |
| Other                       | (4.7)  | (...) | (9.5)  | (...)                   | (...)                   |
| Trade taxes                 | 1.3    | 1.9   | 1.1    | 3.0                     | 0.3                     |
| Property taxes<br>and other | 0.2    | 2.7   | 1.5    | 1.0                     | 2.5                     |

Source: IMF, Government Finance Statistics Yearbook.

1/ Does not include social security contributions.



CHART 1: MEXICO  
GDP GROWTH RATES, 1966-1987

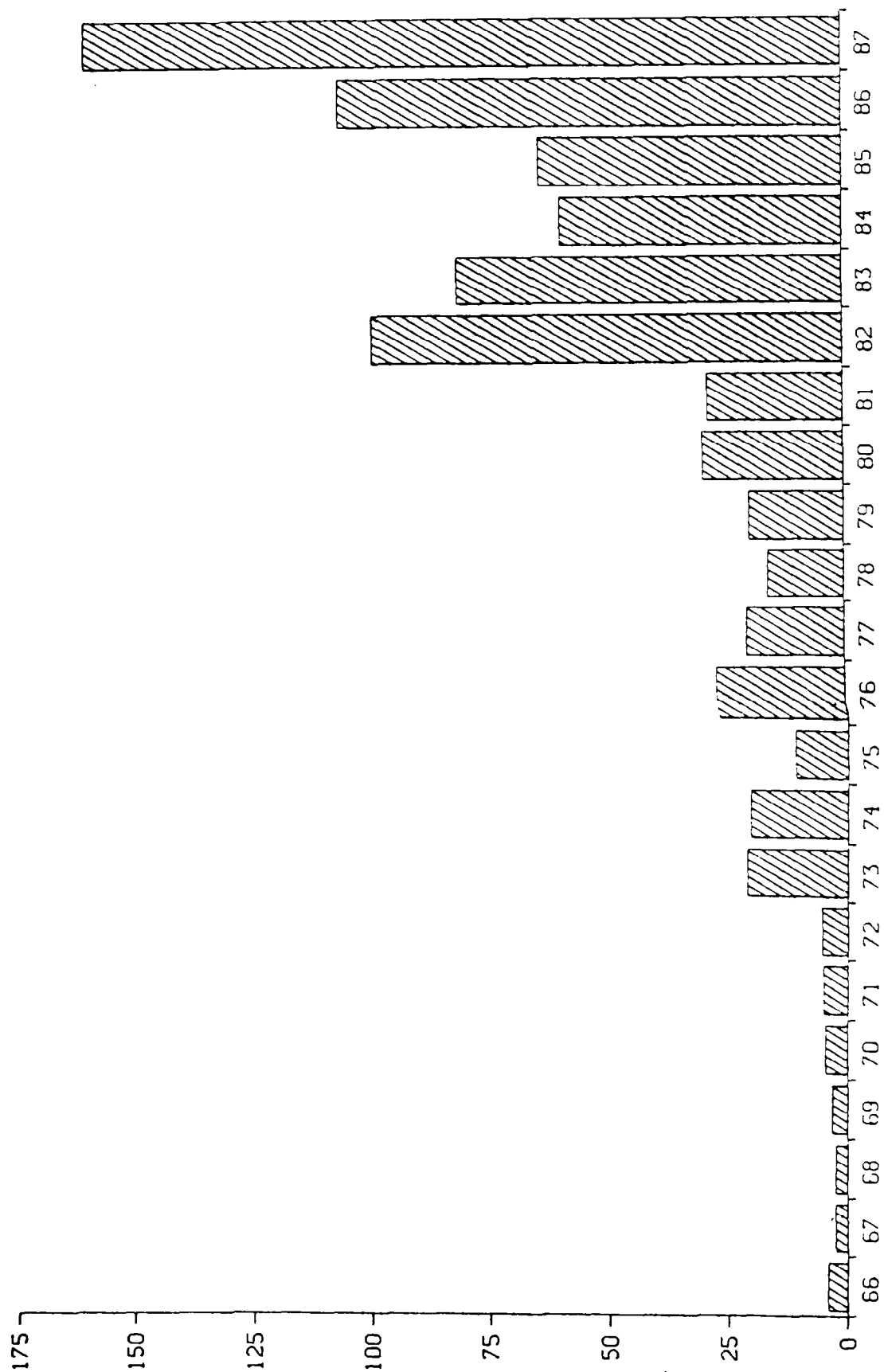


Source: Indicadores Económicos, Banco de México.





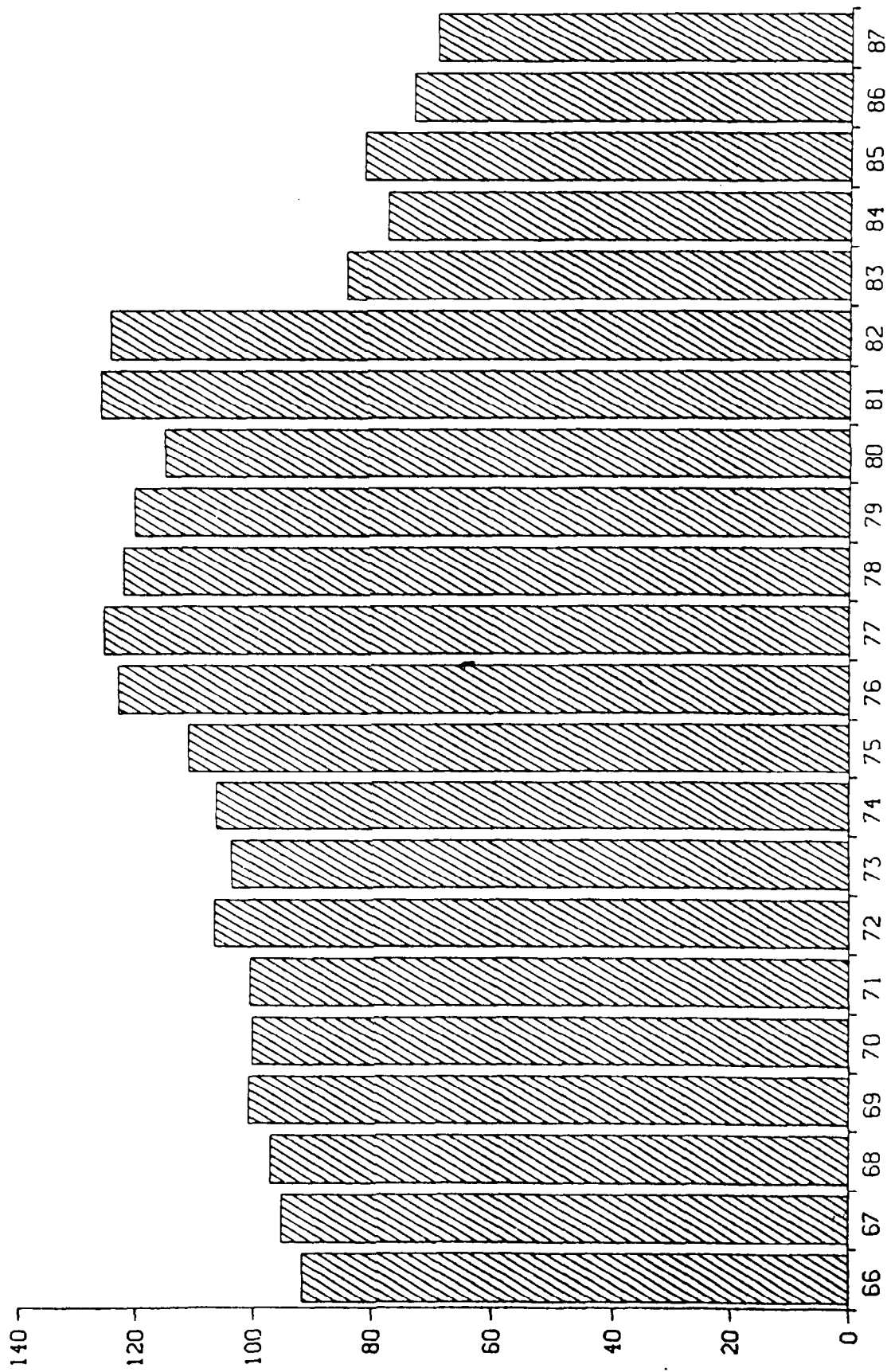
CHART 2: MEXICO  
RATE OF INFLATION



Source: Indicadores Económicos, Banco de México.



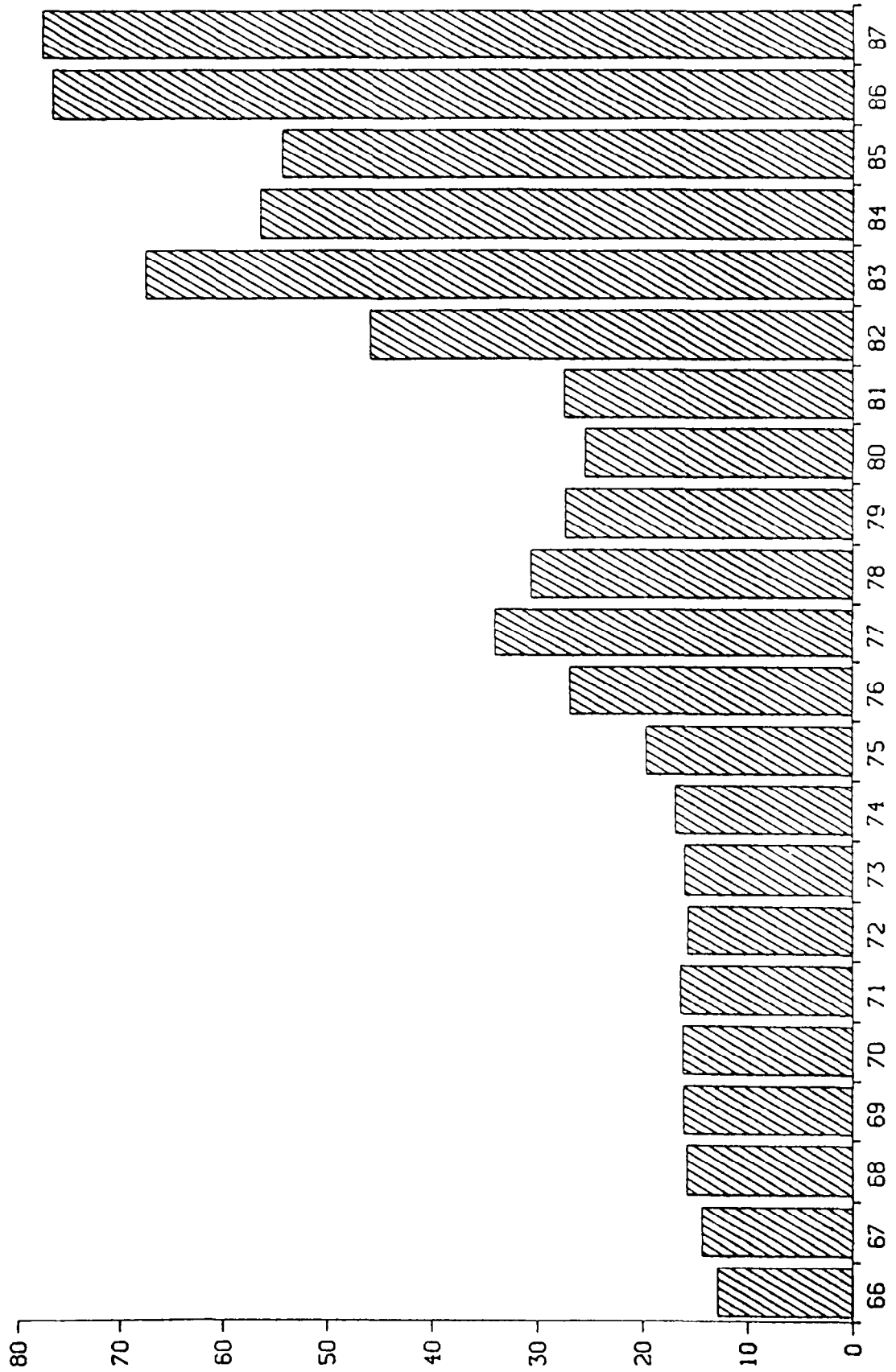
CHART 3: MEXICO  
REAL WAGES, 1970-100



Source: Indicadores Economicos, Banco de Mexico



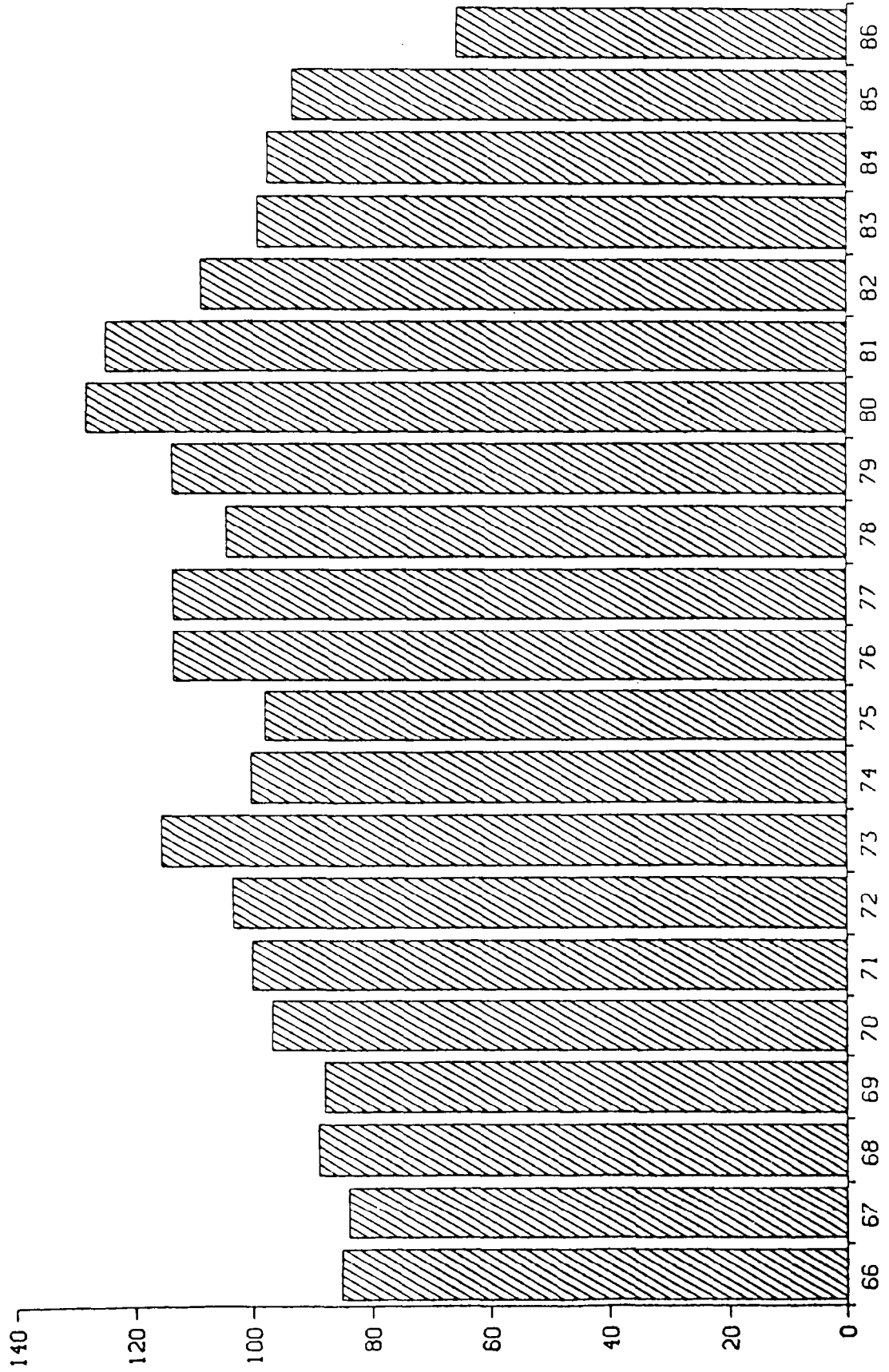
CHART 4: MEXICO  
FOREIGN DEBT AS PERCENT OF GDP



Source: Gil Díaz and Ramos Tercero (1987).



CHART 5: MEXICO  
TERMS OF TRADE INDEX

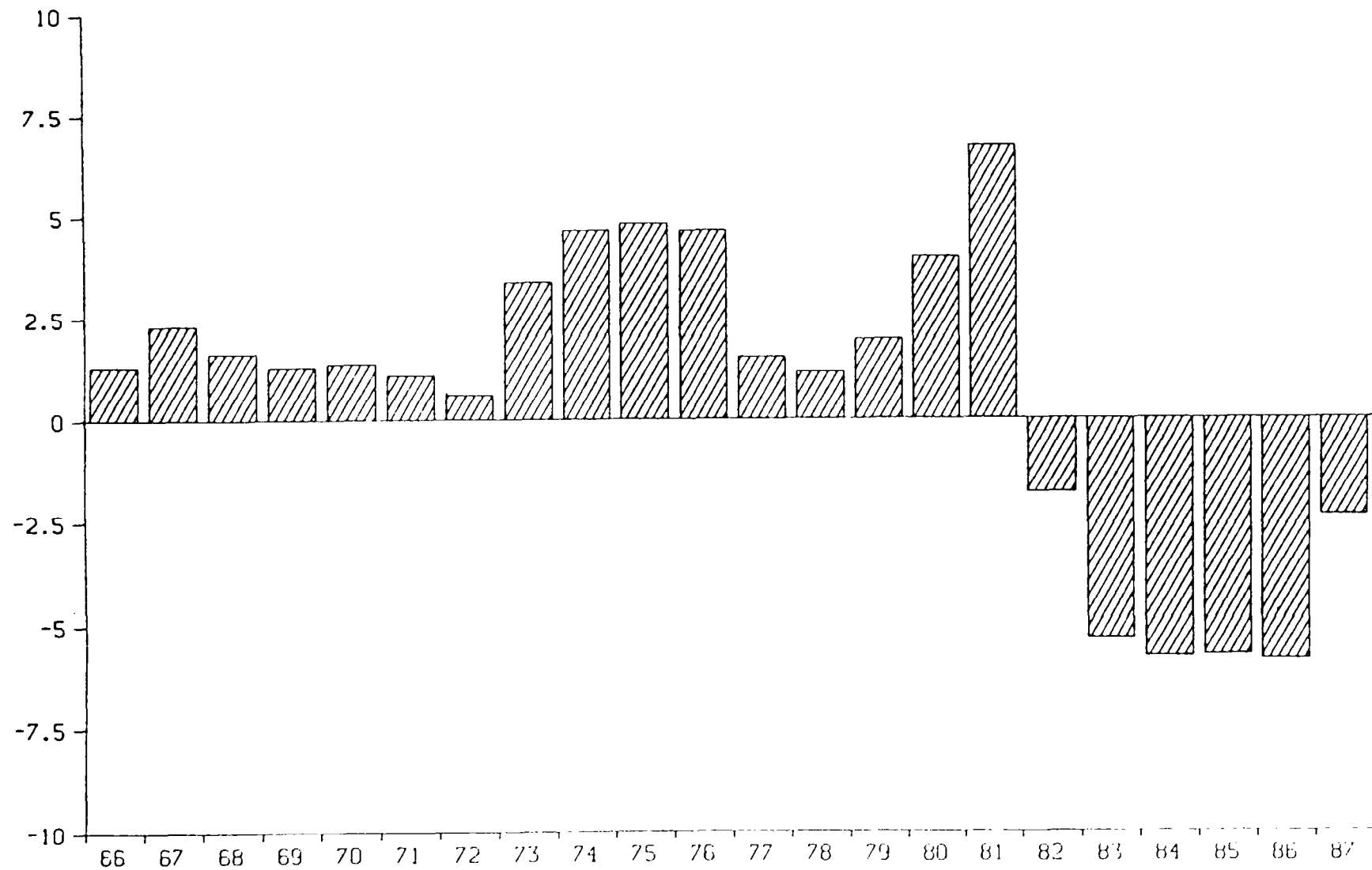


Source: Indicadores Economicos, Banco de Mexico





CHART 6: MEXICO  
NET CAPITAL INFLOW AS PERCENT OF GDP



Source: Indicadores Economicos, Banco de Mexico.



CHART 7: MEXICO  
PRIMARY DEFICIT

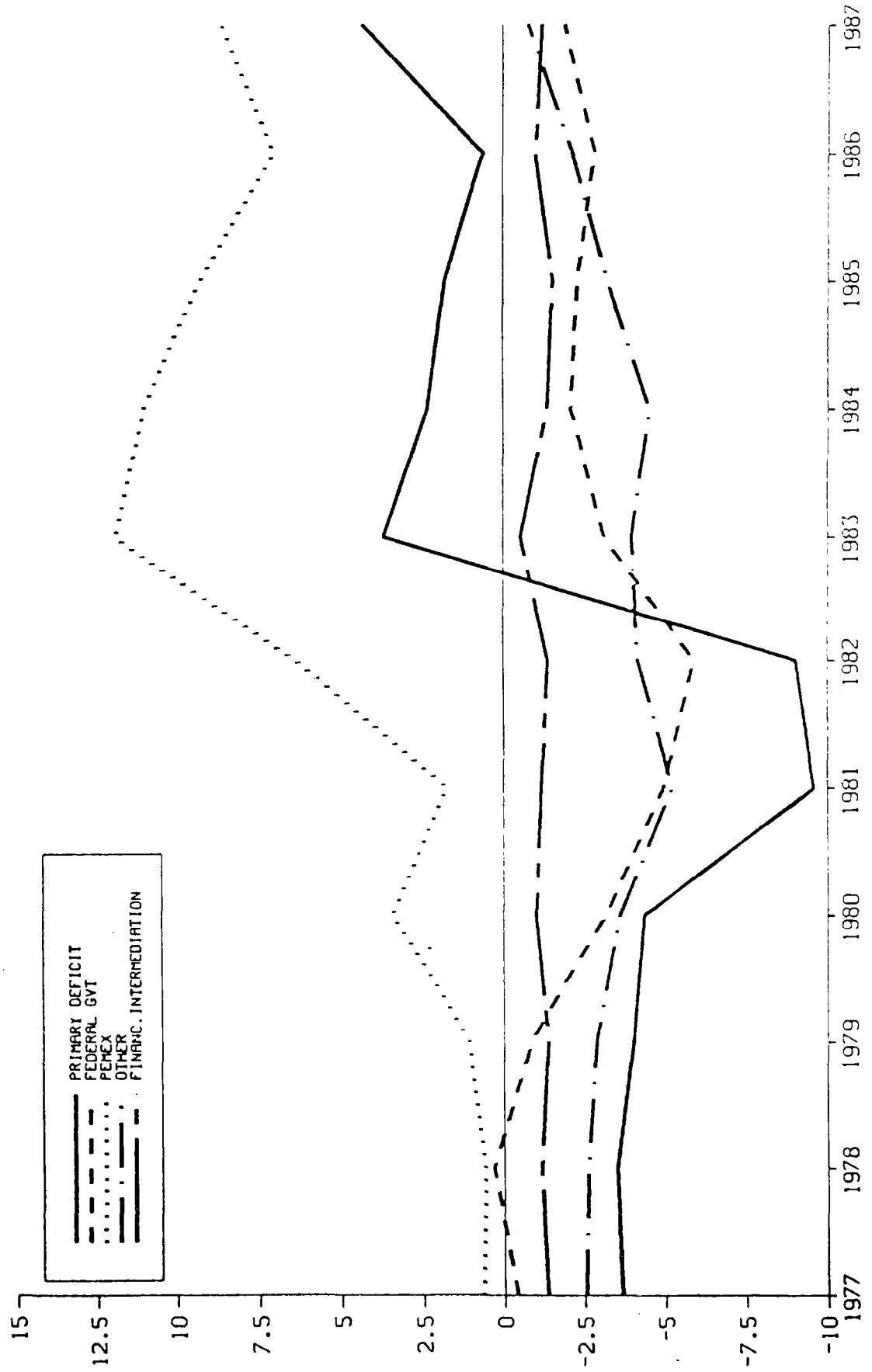




Chart 8  
Real Exchange Rate Indices

(1970 = 100)

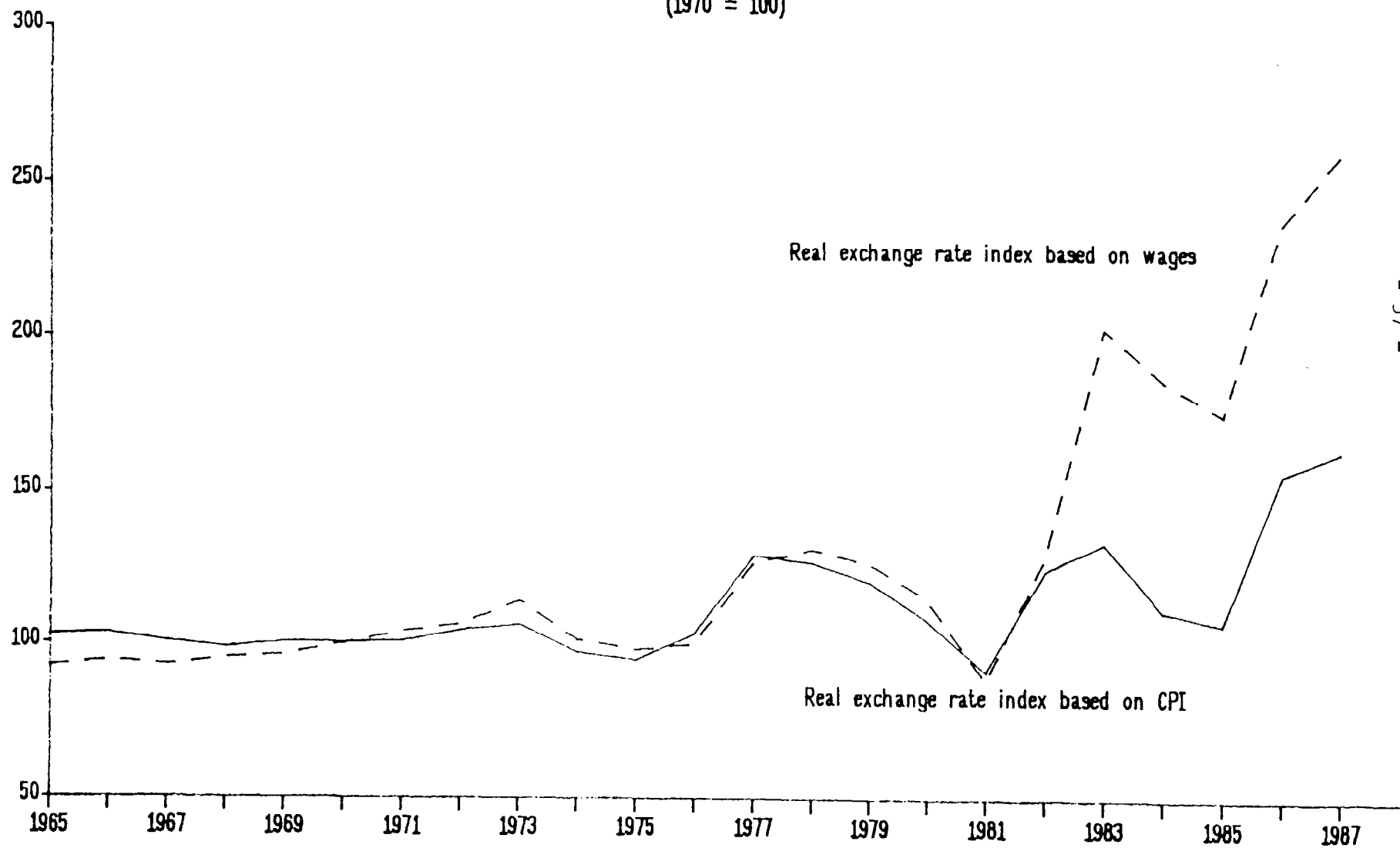
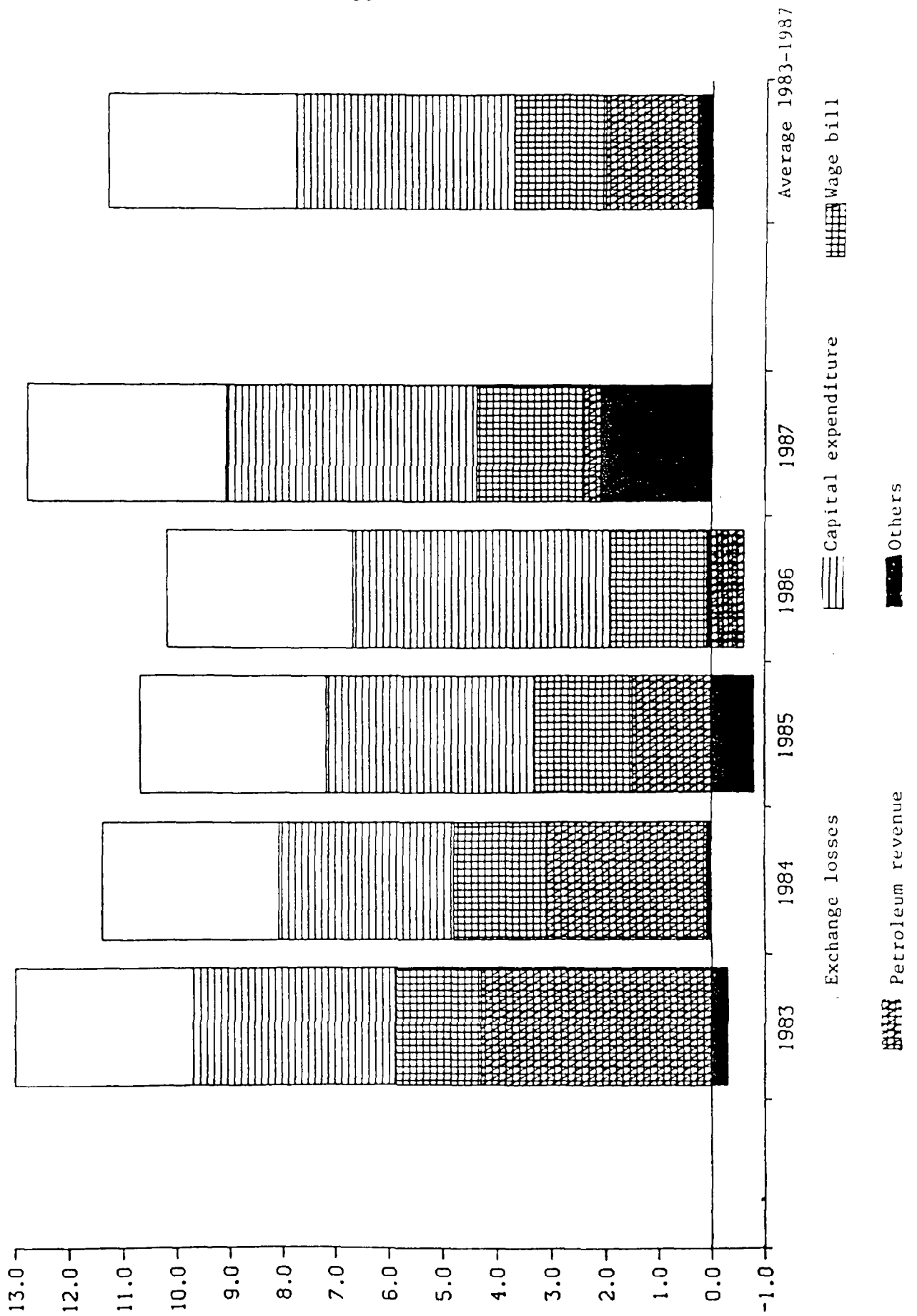




CHART 9. FISCAL ADJUSTMENT, 1983-1987



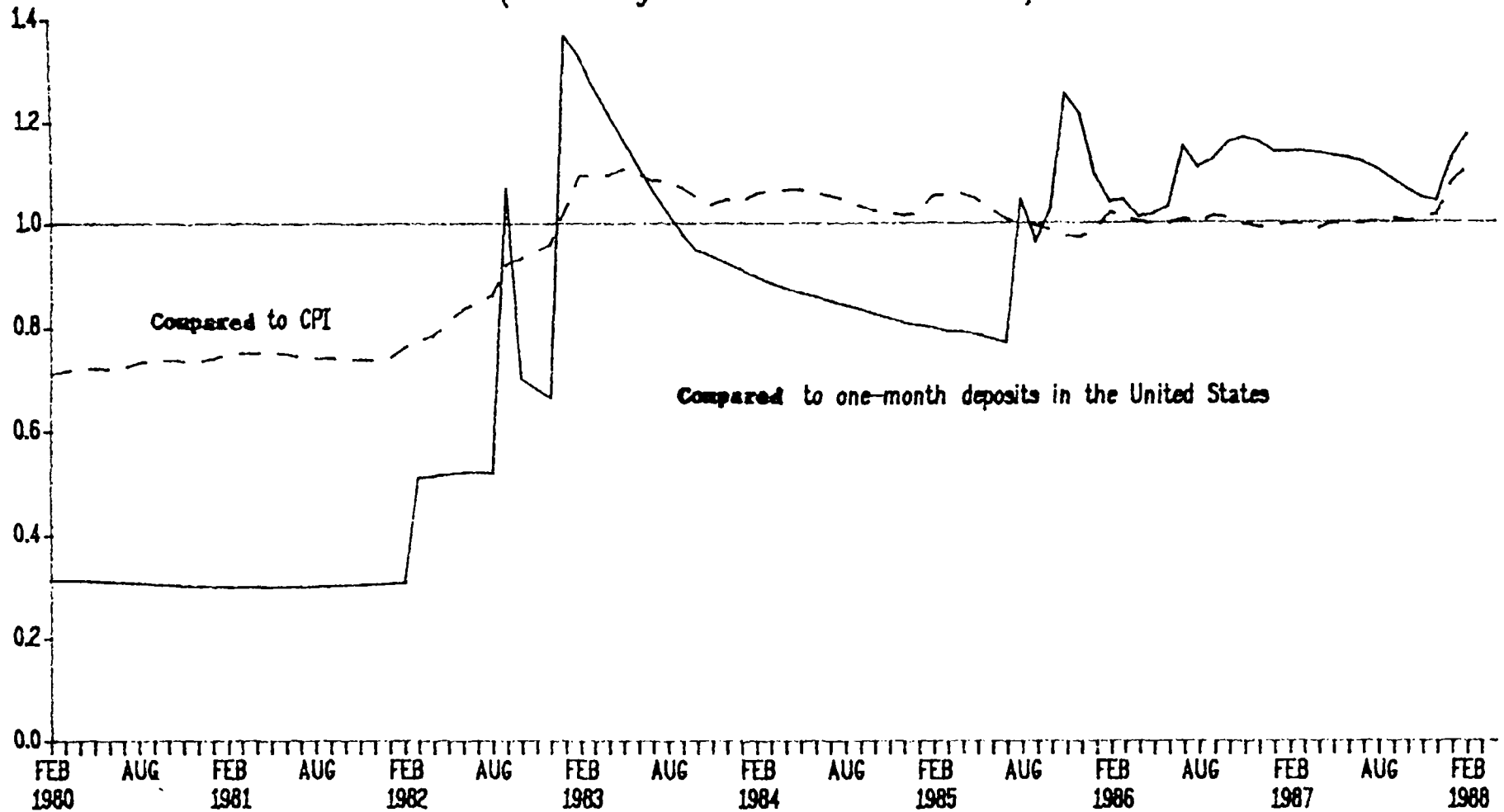




# Chart 10

## Compounded Returns on One-Month Deposits in Mexico 1/

(February 1980 - March 1988)



1/ Withdrawals in March 1988.



CHART 11  
COMPOUNDED REAL DEPOSIT RATE,  
COMPOUNDED REAL MONEY MARKET RATE, AND REAL EXCHANGE RATE

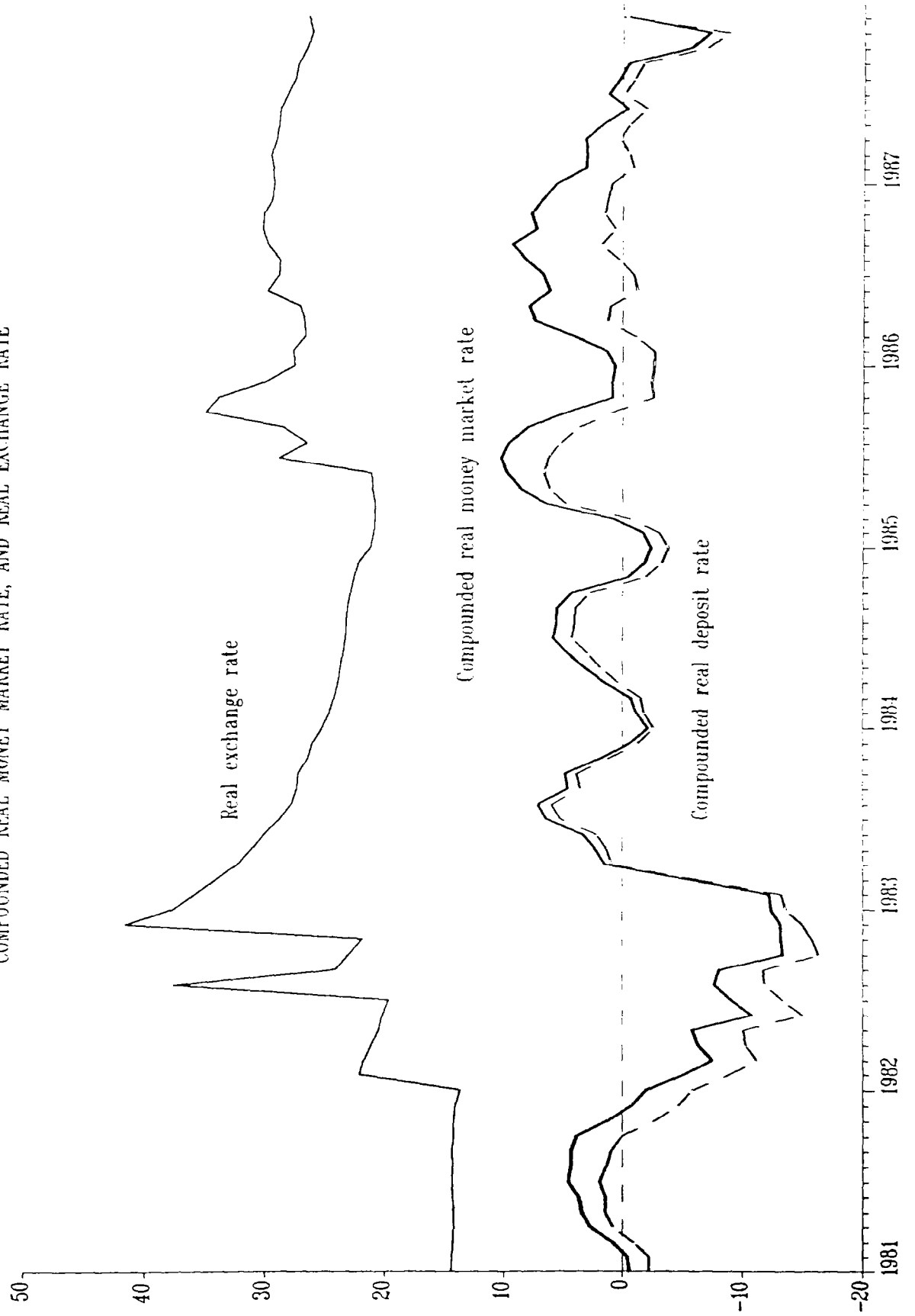




CHART 12

GDP GROWTH RATE AND

RATIO OF PRIVATE SAVINGS TO PRIVATE DISPOSABLE INCOME

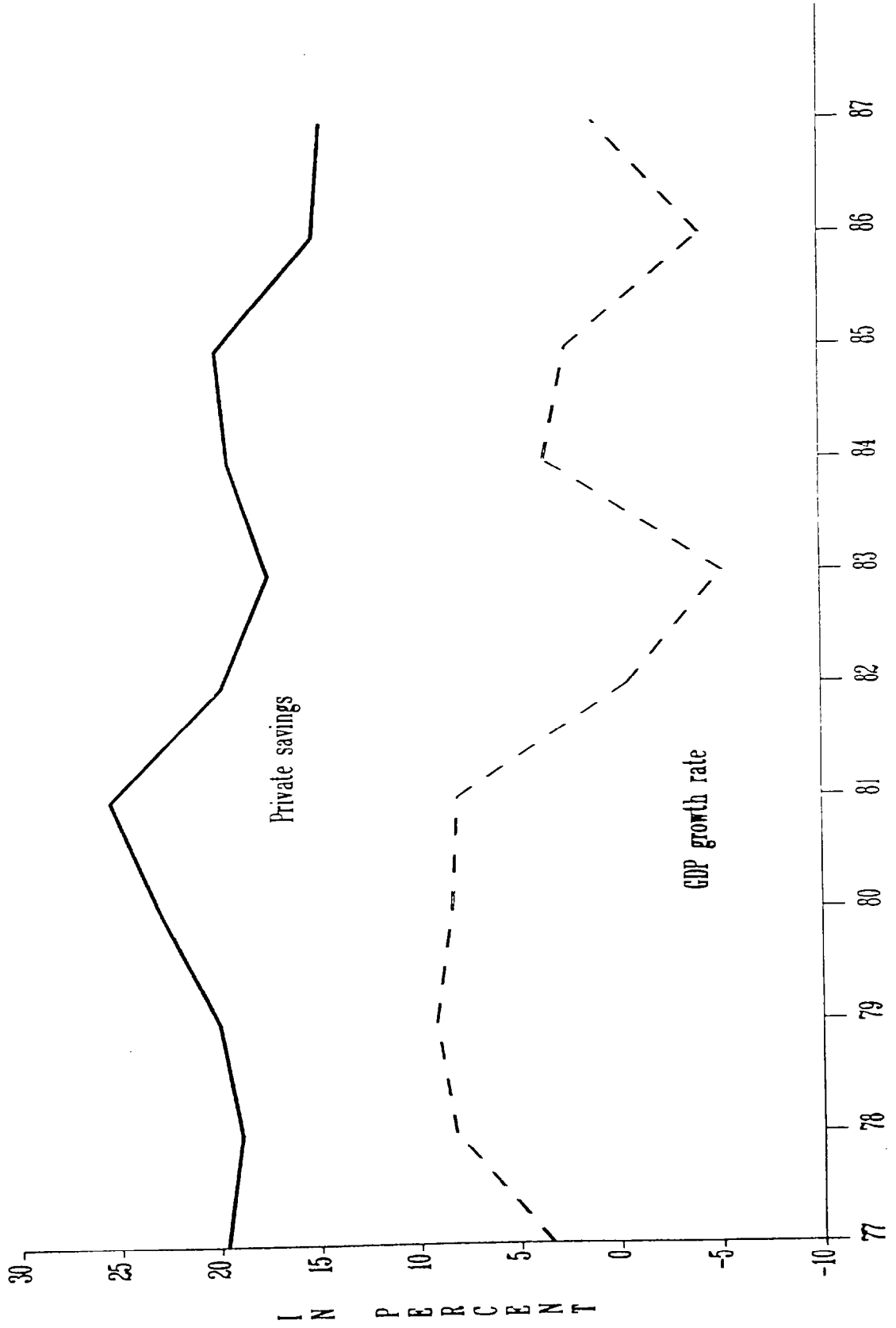




Chart 13

# Petroleum and Nonpetroleum Exports in Mexico, 1977 - 1987

(In millions of dollars)

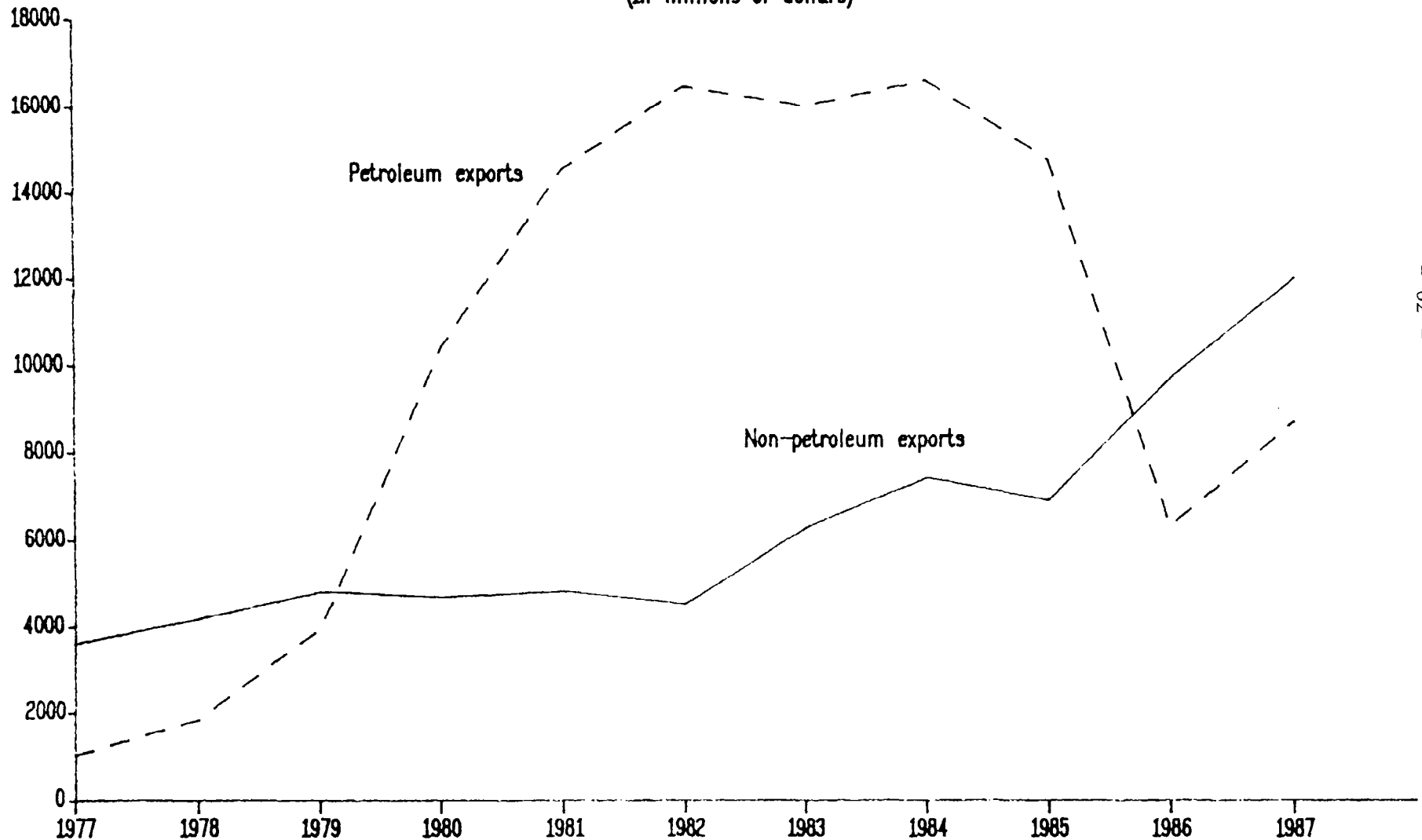






CHART 14  
REAL ENERGY PRICES

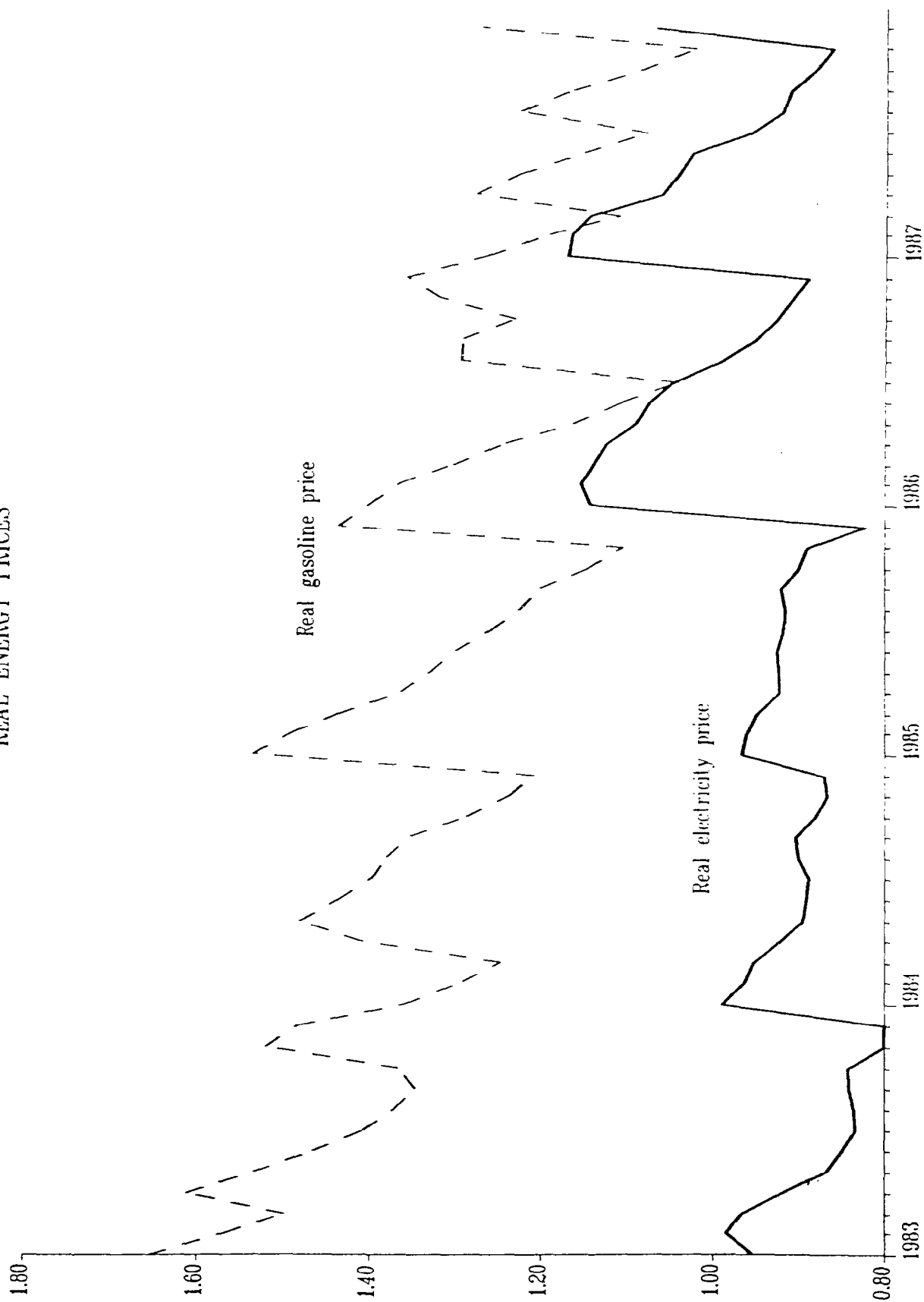




Chart 15

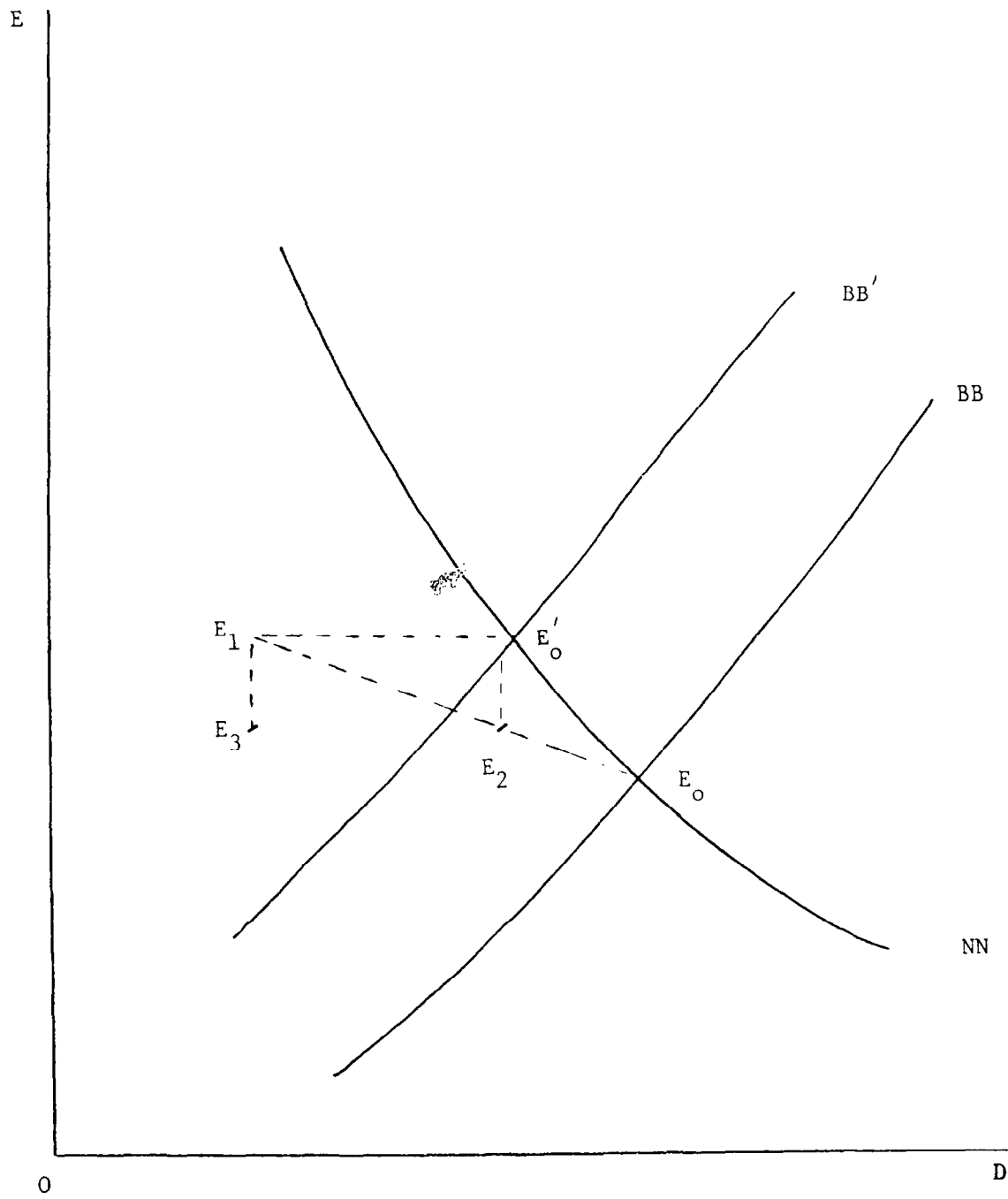




CHART 16  
MEXICO : INFLATION SIMULATIONS

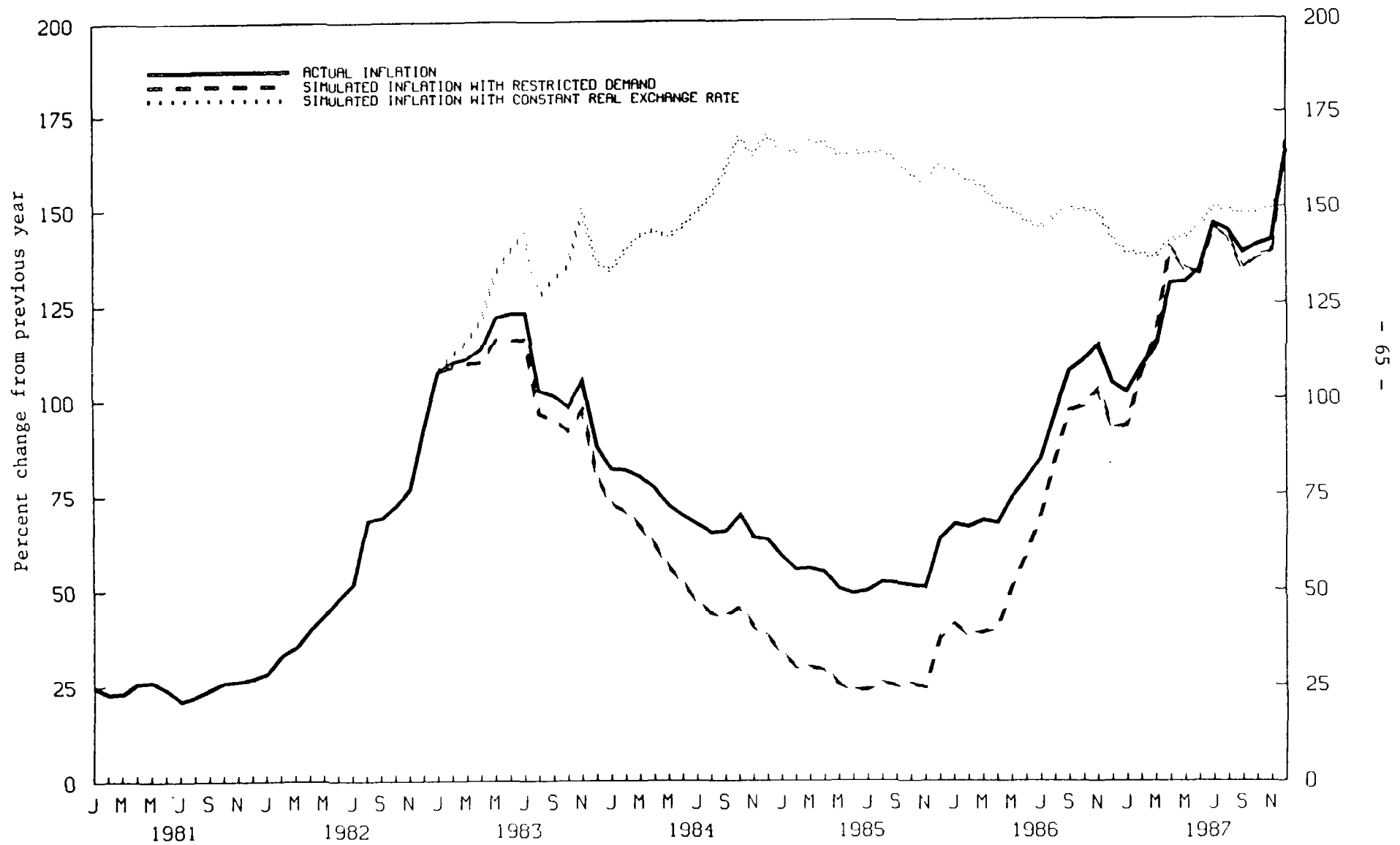




CHART 17  
MEXICO : OUTPUT SIMULATION

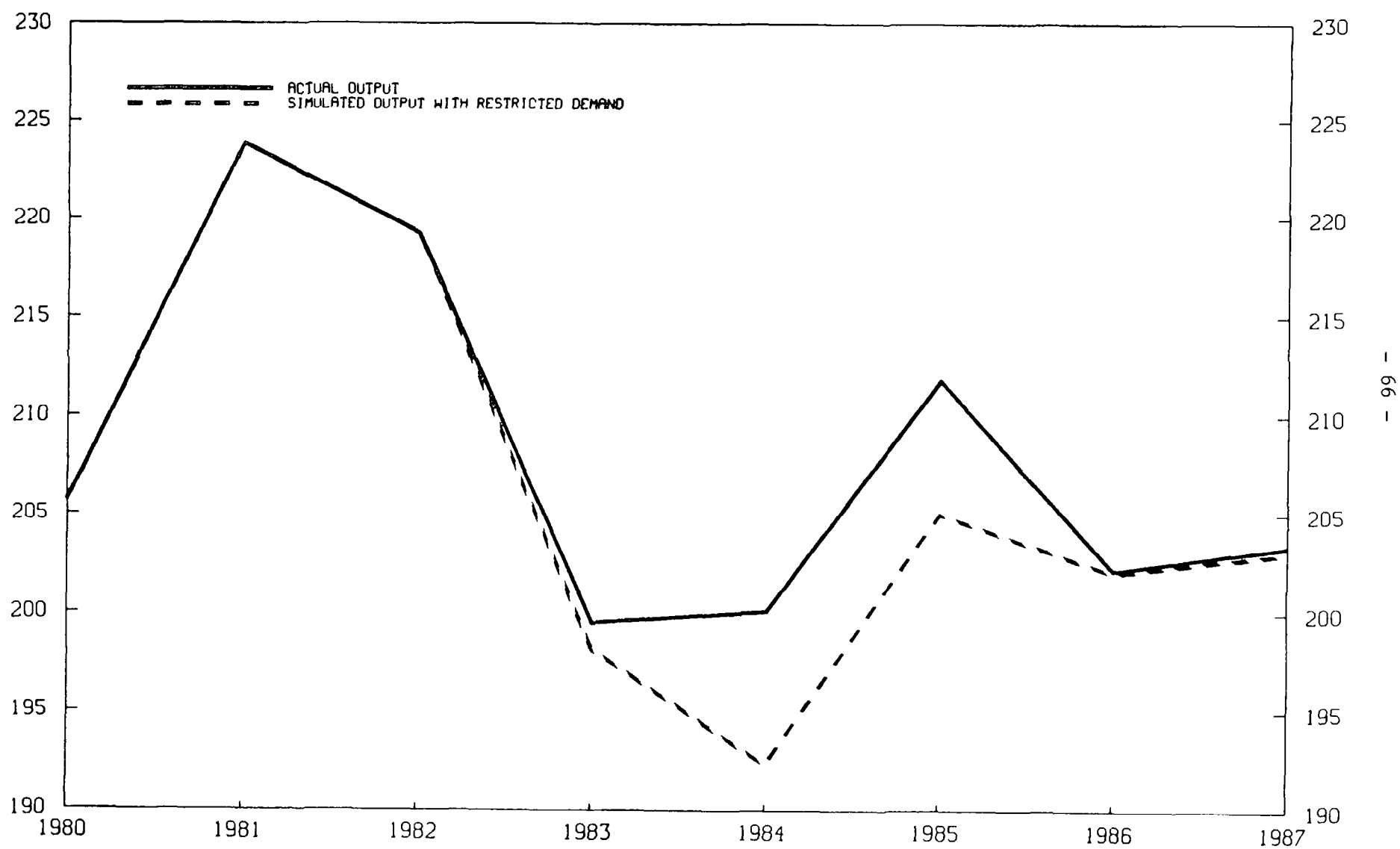
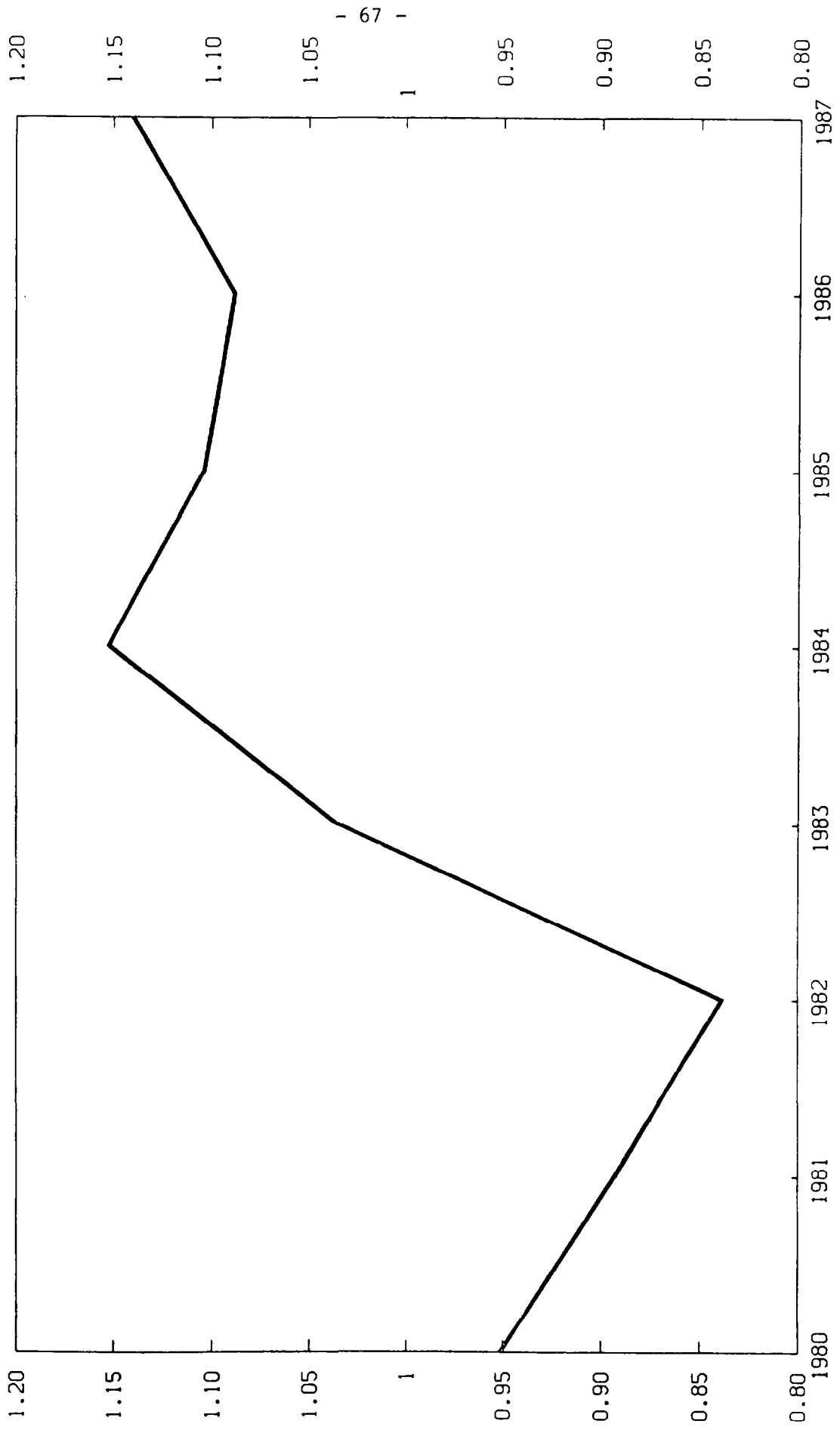






CHART 18  
MEXICO : PROFIT MARGIN INDEX





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