The Decline in Mexican Saving: A Cost of Reform?

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Since the mid-1980s, Mexico has been engaged in a vigorous program of stabilization and structural adjustment. Its efforts have been often cited in the international community as a model for the type of reforms that Latin America needs to adopt if it hopes to mimic the growth experience of East Asia. Great progress was made in the macroeconomic sphere, with elimination of the public-sector budget deficit and sharply reduced rates of inflation; and the government enacted many of the structural reforms urged on the developing nations by international organizations. Mexico liberalized its trade regime, established both current and capital-account convertibility in its international transactions, privatized the national banks, and sharply reduced government regulation of the domestic financial system. As judged by the willingness of international investors to commit funds, the Mexican program appeared to be a huge success. By 1993-94, it was attracting large volumes of foreign direct investment, and portfolio capital poured in at record rates.

The actual gains in economic performance, however, have been disappointing. The economy did rebound from the 1986 recession, and the export sector has responded very strongly to the trade liberalization measures; but overall growth remained well below the rates achieved in the 1970s. And, when international investors, for a variety of reasons, soured on Mexico in 1994, it was hit by a severe external financing crisis and an economic collapse even worse than those of

1983 and 1986.

In retrospect, one of the most notable features of the Mexican experience was the failure of the reforms to move the economy in the direction of higher rates of domestic saving and capital accumulation. As shown in figure 1, domestic investment had by 1990 largely recovered from the depressed rates of the mid-1980s, but it did not reach the peak share of GNP achieved in the early 1980s, and it has remained far below the rates that have become common for East Asia. Even more surprising, the rate of national saving actually fell substantially, from an average 24 percent of GNP in 1981-85 to 16 percent by 1993. The decline in national saving is all the more remarkable given the sharply reduced public-sector deficit. With the deterioration of internal saving, Mexico became increasingly dependent upon net inflows of foreign resources, averaging in excess of 6 percent of GNP in 1992-94, to finance investment.[1] Several observers have pointed to the low rate of saving and the consequent excessive dependency on external financing as fundamental factors behind the peso crisis of 1994-95.

The purpose of this paper is to examine the behavior of the Mexican saving rate in the years after 1987 and to evaluate several hypotheses that have been put forth to account for its decline. The issue extends beyond Mexico because of concerns that the fall in the domestic saving rate may have been induced by the reform program or by the foreign capital inflows associated with liberalization of the capital account. If either of these factors were important, the Mexican experience would introduce a note of caution for other countries considering the enactment of a similar program.

The paper is divided into two major sections. The first focuses on issues of measuring

[1]While the size of the capital inflow is large by international standards, it represents a turn to the pattern of the 1970s.

saving and extends the Mexican national accounts to include a division of national saving between the public and private sector. A substantial portion of the debate over the causes of the saving decline can be traced to differences in the measures of saving that various studies or commentators have used. In particular, there are important differences of view about whether the fall in saving was concentrated in the public or private sector. The second portion of the paper focuses on a set of specific hypotheses that might account for reduced saving and develops data to evaluate their relevance to the Mexican situation.

The paper adopts national saving, as opposed to domestic saving, as the most appropriate measure of saving effort, and concludes that the decline began about 1987 and that it has totaled about 5.5 percent of GNP between 1985-87 and 1992-94.[2]

The allocation of the decline between public and private saving is dependent upon the measure of the public budget balance: whether it is defined to include or exclude the financial intermediation activities of government. It is also critical to adjust for the effects of inflation on interest payments between the public and private sectors in order to derive a meaningful division of the aggregate saving. The Mexican data also appear to yield strong evidence of Ricardian equivalence -- an inverse relationship between the public and private saving rates. However, the inverse relationship can be traced to mis-measurement of the real income component interest payments on the public debt. During periods of high inflation, the government made large interest payments to the private sector; but a large portion of that payment represented a repayment of principal and not income. Thus, fluctuations in inflation generate large variations in capital

[2]The precise magnitude of fall is sensitive to the choice of a base period because the saving rate was rising over the decade of 1975 to 1985. The decline is considerable smaller relative to the 1970s, when the saving rate averaged 18.7 percent, compared to a peak of 26 percent in 1983.

transfers between the government and the private sector. If those transfers are not excluded from the income measures, they result in the appearance of an inverse relationship between public and private saving. On the basis of our preferred definition of public saving, which excludes financial transactions and is adjusted for inflation, the fall in national saving is largely a private-sector phenomenon.

While it is difficult to firmly associate the saving decline with any single aspect of the Mexican reform program, the data developed in this paper suggests that much of the fall can be attributed to a boom in asset markets that generated large capital gains and a liberalization of financial regulation that permitted a large expansion of credit to the private sector. It also appears that a strong inflow of foreign portfolio capital, which was very large relative to the domestic equity market, contributed to the surge in capital gains. It is more difficult to attribute the fall in saving to the stabilization program, and the overall current account deficit emerges more as a consequence rather than a cause of the saving decline. The stabilization program and the liberalization of the external capital account, however, undoubtedly played an indirect role through their effects of expectations for the future course of the Mexican economy, and their impacts on developments in domestic financial markets. The Mexican experience stands out primarily as a warning about the potential dangers of rapid liberalization of financial markets and institutions.

I. The Measurement of Saving

Mexico has a limited set of national accounts that presents a balance of saving and investment only at the level of the nation as a whole. That is, there are no domestic sector accounts, and it is not possible to obtain official measures of saving for the private and public sector. In the opinion of several international organizations that have recently reviewed the Mexican accounts, however, the available data are of relatively high quality and comparable to those produced by other middle-income countries. The largest question at present results from the continued reliance upon the input-output table of 1980 to generate the accounts. There are some doubts about the reliability of the data for the 1990s, given the magnitude of the structural changes that have taken place within the economy over the past 15 years.[3]

National versus Domestic Saving

At the aggregative level, the most significant measurement issues arise from the choice of the income concept used to define saving and the treatment of international payments. The international system of national accounts (SNA) incorporates a significant distinction between Gross Domestic Product (GDP), the total amount of income obtained from production within the geographical confines of a country, and Gross National Income (GNI), the total amount of income earned by residents of the country. The latter differs from the former by the amount of net factor income and transfer receipts from the rest of the world. For some countries the distinction can be quite important. While saving of industrial countries is nearly always defined as

[3]In the past, Mexico has introduced a new base for the national accounts every 10 years, Such a revision is currently in progress.

gross national saving (GNS), GNI less consumption, the development literature has often used an alternative concept of gross domestic saving (GDS), GDP less consumption. The second concept is a more straight-forward calculation from standard expenditure accounts, but it has a limited behavioral interpretation. GDP is not a meaningful measure of the income available to support domestic consumption because it includes the income earned by foreign factors of production, such as multinational corporations.

At the aggregate level, total saving is singularly defined as equal to total capital investment, but the distinction between GDS and GNS alters its distribution between national and foreign sources. Under the GDS concept, foreign saving is defined as simply the negative of the net balance on trade in goods and non-factor services. Using GNS, it is defined more broadly to include the trade balance, net factor income and transfers -- the negative of the current account balance. For net debtor countries, such as Mexico, the GNS concept attributes a larger portion of total saving to the foreign sector.

These measurement issues are of some significance in the Mexican case because of substantial changes in the country's balance on its transactions with other countries. The relationships among the national accounts aggregates are summarized in table 2 for the period of 1970 to 1994.[4] In the early 1970s, Mexico had only a small amount of international debt, and the offset of labor earnings from residents employed in the United States resulted in near equivalence between GNP and GDP. By the mid-1980s, however, net factor income payments had increased to about five percent of GDP, with the result that the income and saving of residents of Mexico

[4]The national statistical institute (INEGI) supplied a set of data for the 1970s recomputed on the base of 1980 to maintain historical comparability. The statistics for the 1970s are, however, only partially comparable with the 1980s. Data for individual years are reported in appendix table 1.

were significantly less than implied by a focus on GDP. After 1983, a combination of lower international interest rates and debt relief resulted in a partial recovery in the ratio of GNP to GDP.[5]

The implications for the various measures of the saving rate are highlighted in figure 2. The gross domestic saving rate shows a very large increase between 1975 and 1983 followed by a precipitous decline over the remainder of the 1980s. In contrast, the rise in the rate of GNS is only half as large and the post-1983 decline is considerably smaller. In the 1990s, the two series have declined in parallel; but the situation will change again in the aftermath of the 1994-95 crisis, as Mexico is forced to curtail its reliance on foreign financing. For both saving concepts, it is evident that much of the recent decline in the Mexican saving rate might also be viewed as a return to normality, reversing the rise of 1975-83.[6] The net national saving rate, which excludes capital consumption allowances, indicates a slightly larger decline because of a gradual rise in the ratio of capital to GNP.

Public-Sector Budget Accounts

As mentioned previously, the Mexican national accounts do not include a public sector. The national accounts do, however, provide data on public-sector investment, defined to include

[5]"The focus of this paper is on the concept of gross national saving, and for consistency saving and the related concepts are scaled by GNP rather than GDP. The choice of the scalar has very little effect on changes in the reported ratios, however.

[6]A recent article on the Mexican economic crisis, Gil-Díaz and Carstens (1996), has added to the confusion because the authors reversed the names of the two saving series. They preferred the GDS concept for analysis because the corresponding income is measured prior to the net payment to foreign factors.

general government and the public enterprises. Thus, it is possible to create a rough measure of public-sector saving by adding the national accounts' measure of physical investment to an estimate of the net budgetary position of the government. In countries that do estimate a public sector account within their national accounts, the two measures of the overall government deficit are quite comparable. The two accounting systems often yield quite different measures of government capital formation, however; and it is not advisable to mix budgetary data on investment with that of the national accounts.

The Mexican budgetary accounts distinguish among: (1) the federal government, (2) organizations and enterprises subject to direct budgetary control, and (3) entities that are not controlled directly but whose income and expenditures are included in the budget. In addition, there is a residual category of difference between the detailed income-expenditure accounts and the government's financial accounts.[7] Most measures of the public-sector budget include all four components. The category of federal government includes many of the standard functions of general government, but some organizations, such as social security, are included in the second category together with government owned enterprises such as Pemex. The Federal District government is the most prominent entity that is not subject to direct budgetary control.[8] Furthermore, the public-sector accounts do not include the budgets of state and municipal governments; but, because they have very limited independent borrowing authority and rely heavily on transfers from the central government, their exclusion has a relatively small effect on

[7]The discrepancy is largely the result of timing differences in the reporting of income and outlays.

[8] I did not attempt to reclassify the budgets of the organizations to construct a measure of the general government balance. Many of the enterprises are so thoroughly integrated into the budget that the distinction is of limited meaning. An examination of the operating balance of the major enterprises suggests that the trend in the balance of general government would be similar to that of the total.

the net public-sector budget balance. The basic budgetary data are summarized in table 3 as a percent of GNP for the period of 1970-94.[9]

Finally, most budget presentations emphasize the concept of *economic balance*, which excludes government lending activities. The economic balance also excludes the budgetary effects of the 1990 debt renegotiation and privatization revenues. The *financial balance* was traditionally defined as the economic balance plus financial intermediation, the lending activities of government financial institutions. Beginning in 1993, however, the Mexican government changed the concept of the financial balance to exclude financial intermediation, essentially eliminating it as a separate budget concept. They argued that the subsidy element of the lending programs had been largely removed, and that it was inappropriate to include purely financial transactions in the basic budget. The decision to ignore the loan programs has been criticized by some analysts who point to a generally poor record of loan recovery and continued emphasis on directed credit -- particularly to sub-national governments. Thus, this study continues to use both concepts of the public sector balance.

The two budgetary measures are shown as a percent of GNP in figure 3. Prior to the 1990s, they moved very much in parallel. The financial balance was typically about one percent of GNP less than the economic balance. This pattern was broken in 1993-94 when financial intermediation expanded to over three percent of GNP, coincident with its exclusion from the official budget. Both measures show a dramatic improvement in the budgetary situation after 1987, when the economic balance went from a deficit equal to 16 percent of GNP to a 1992 surplus of 1.6 percent. The change may be a rather misleading indication of fiscal policy,

[9]Data for individual years are given in appendix table 2.

however, because it is largely a result of a large decline in inflation, and thus nominal interest payments on the public debt. The primary budget balance -- excluding interest payments -- shows that the major fiscal change, in terms of taxes and program outlays occurred in the early to mid-1980s, and there were only small changes in the non-interest balance in subsequent years.

The dominant role of interest payments suggests the usefulness of a focus on a third concept, the operational budget balance, which excludes the inflation component of interest payments on the public debt.[10] That is, in an inflationary environment, a portion of interest payments on debt represents a repayment of loan principal, amortization, rather than constituting income to the recipient. The operational balance is computed on a monthly basis as the economic balance plus the inflation rate time the outstanding stock of peso-denominated debt. As shown in the second panel of figure 3, the inflation adjustment makes a considerable difference, both because of the sharp variations in inflation and significant changes in the proportion of the domestic debt that is denominated in pesos. There are actually two measures of the operational budget balance, corresponding to the economic balance and the financial balance. They differ because the inclusion of the loan programs results in a much different measure of the net public debt. The most frequently used concept corresponds to the economic balance. The operational budget balance is in surplus in 1987, when the nominal deficit is still 16 percent; and it implies a much smaller post-1987 shift in fiscal policy than the nominal data.

[10]The calculation is done on a monthly basis; and it is important to note that the adjustment is limited to peso-denominated debt because a significant portion of the domestic debt is denominated in dollars.

Private Versus Public Saving

The alternative estimates of public saving obtained by adding public-sector investment to the above measures of the budget balance are shown in figures 4 and 5. Looking first at the nominal measures of figure 4, the most striking feature is the strong inverse correlation between the measures of public-sector saving and the implied residual estimate of private saving. Between 1987 and 1992 the public saving rate, based on economic balance, improves by 16 percent of GNP, but any gain to national saving is more than offset by a 23 percentage point drop in the private saving rate. This nominal data is the basis for much of the claim of Ricardian equivalence. It is, however, simply a product of the treatment of nominal interest payments. In the inflation-adjusted data of figure 5, the inverse relationship between public and private saving is much smaller: the 1987-92 improvement in the public-sector saving rate is largely eliminated; and the estimated decline in the private saving rate is dramatically reduced to about 6 percentage points.

The sources of the inverse correlation is made more evident in the following table which reports a set of simple regressions of the private on the public saving rate:

$$rs_p = a + b \cdot rs_g.$$

The first equation is based on the nominal data and the coefficient on public saving implies a private-sector offset in excess of unity. The coefficient is highly significant, and this simple relationship explains 85 percent of the variation in the private saving rate. In contrast, the same regression using the inflation-adjusted data results in a much smaller offset, -.52, and it is only marginally significant.

Equation	Coefficient on public saving	t-statistic	Dependent var. - independent var.
1	-1.31	11.6	nominal - nominal
2	-0.52	1.8	real- real
3	0.65	1.9	nominal - primary
4	0.08	0.1	real (instrumental variable)

Even with the inflation-adjusted saving measures, the coefficient estimates are biased, however, due to measurement error. Since private saving is obtained as a residual, any error in the measure of public saving automatically gives rise to a negative correlation between the two saving rates. One means of reducing this problem is to construct a measure of public saving using the primary budget balance, which excludes all interest payments. As shown in equation 3, there is actually a positive correlation between this concept of public saving and the nominal private saving rate. Alternatively, the primary budget balance could be used as an instrumental variable in the regression relating public and private saving. Equation 4, the instrumented version of equation 2, shows no significant correlation between the inflation-adjusted public and private saving rates.[11] Thus, the evidence of Ricardian equivalence appears to be largely due to the difficulties of partitioning interest payments between income and the repayment of principal.

Finally, any conclusion about the allocation of the decline in national saving between the public and private sectors is affected by the choice of whether to include or exclude financial

[11]The sensitivity of the regression results to the instrumenting of public-sector saving suggests that the split of national saving between the public and private sectors is quite imperfect.

intermediation from the public-sector budget. If the financial transactions are excluded, all of the decline in the national saving rate after the mid-1980s can be traced to a decline in private saving. As shown in table 5, this narrow measure of public-sector saving averaged 6.6 percent of GNP in 1992-94 compared to 5.7 percent in 1980-84. Thus, calculated as a residual, the private saving rate fell from 18.1 to 10.9 percent of GNP. Alternatively, if the financial transactions are included, the public-sector saving is lower in all years, and its sharp fall in 1993-94 implies that a strong recovery of the private saving rate was underway prior to the 1994-95 financial crisis.

Standard national accounting procedures would call for the exclusion of financial transactions, after accounting for any subsidy element, on the basis that, in competitive markets, public lending simply substitutes for loans from the private banks. However, if financial markets are distorted by significant non-price rationing, public lending -- even if it contains no subsidy element-- can have real effects. In that case, an argument can be made for treating financial lending as comparable to transfer payments and for using the financial balance to compute public-sector saving. In the specific case of Mexico, it is notable that the surge of government lending in 1993-94 was not marked by any large increase in investment, even though investment was the declared purpose of most of the loans. Thus, the public-sector loans appear to have substituted for private lending, or they were used to support consumption..

Regardless, there is no consensus among the economists who follow the Mexican fiscal situation on whether to include or exclude the financial intermediation. In a recent article, Gil-Díaz and Carstens of the Mexican central bank adopt the view that government lending is equivalent to transfer payments.[12] They use the inflation-adjusted financial balance to measure

[12]Gil-Díaz and Carstens (1995).

government saving, and they focus on the 1989-93 period, ignoring the large decline of national saving in prior years. With these assumptions, they can attribute the decline in saving to government, not the private sector; and they argue that there is no saving puzzle to be explained. While their position may be extreme, it illustrates the importance of the differing concepts of public saving in any explanation of private saving behavior.

II. Accounting for The Saving Decline

The greatest difficulty with an effort to account for the fall in Mexican saving is the surplus of possible explanations. So many aspects of the Mexican economy, with a potential impact on saving, were changing within a very short time span that it is difficult to discriminate among them. The major issues, however, revolve around three hypotheses that trace the saving decline to: (1) an exchange rate-based stabilization program, which, operating through wage-price distortions or a lack of confidence that it would succeed, encouraged consumers to substitute current for future consumption, (2) liberalization of the external sector (particularly the large inflows of foreign capital), and (3) liberalization of the domestic financial system. All three of these explanations might also be combined as contributors to what emerges as a very large surge of asset-market prices in Mexico.

The analysis can be simplified by focusing only on those measures of the private-public division of saving that incorporate an inflation adjustment for interest payments. On this basis, there is no significant change in the Mexican fiscal situation until 1993-94, and the decline in national saving is largely a question of what happened to private saving.

It is convenient to use 1987 as the transitional year, both because it marks a relatively high

level of the national saving rate and because the Mexican stabilization program was introduced in December of 1987. Given the potential for measurement error, however, it is best to average the data over a few years. On this basis, there was a 5.4 percentage point drop in the national saving rate between 1985-87 and 1992-94, heavily concentrated in the private sector.

Item	1985-87	1992-94	Change
National Saving	21.5	16.5	-5.4
Version I: Economic Budget Balance			
Public	5.9	6.1	0.2
Private	16.0	10.4	-5.6
Version II: Financial Budget Balance			
Public	3.7	2.2	-1.6
Private	18.2	14.4	-3.8

If the public-sector balance is defined to exclude financial transactions, all of the decline in the saving rate is in the private sector. Alternatively, if government financial transactions are included, about 1.6 percentage points of the drop is within the public sector. However, the issue of how to treat government financial transactions is of major significance only in 1993-94, well after much of the fall in the national saving rate.

Exchange Rate-Based Stabilization

Exchange rate-based stabilization programs, similar to that of Mexico, have frequently been accompanied by a surge of private consumption.[13] Several hypotheses have been advanced to account for an outcome that seems so counter to standard expectations that the reduction of

[13]For extensive documentation see Rebelo and Végh, 1995.

inflation would require a period of austerity. In the early 1980s, Dornbusch and others argued that it was part of a more general phenomenon in which domestic demand rose in response to a sharp drop in real interest rates, appreciation of the real exchange rate, and higher real wages, all of which could be traced to sticky nominal wages and prices.[14] With capital mobility (interest-rate parity), a fixing of the exchange rate would lead to an immediate fall in the nominal interest rate, but the delayed response of prices would slow the adjustment on the real side. A related hypothesis by Calvo suggested that private agents expected the decline in inflation to be temporary.[15] Again, the lower nominal rate of interest would translate into an even larger decline in the expected real interest rate, the cost of current versus future consumption.

If the expansion of demand is concentrated in consumption, the above explanations are dependent upon a relatively high elasticity of substitution between current and future consumption, something that has been difficult to support empirically. It is troubling, moreover, to use an argument of 'temporariness' to sustain a decline in saving that has extended over a period as long as that of Mexico. As shown in table 6, nominal interest rates did fall promptly after the introduction of the stabilization program at the end of 1987, but the rate of inflation fell even faster. Thus, *ex-post* real rates of interest were considerably higher in the years after 1987 than before. The highly repressed nature of Mexican financial markets prior to 1987 allowed the government to maintain a highly negative real return to savers during the prior years of high inflation, and the stabilization program would appear to have raised returns. If the problem was expectations, and if investors expected inflation to break out again, they should have been willing

[14]Dornbusch, 1982.

[15]Calvo, 1986.

to pay a premium for indexed bonds (adjustabonos), which were introduced in 1989. Yet, the market rate on those bonds, column 3, appears to have been equal to or higher than the ex-post real rate on regular issues.[16] Furthermore, real wages actually fell in the first year of the program and rose at a relatively modest 2.5 percent annual rate over the 1987-94 period.[17] The real wage did not regain its 1987 level until 1991. While the gains were modest, they still stand in sharp contrast to the 30 percent drop in the real wage between 1980 and 1987. Finally, as shown in a later section, there was no post-1987 surge in durables consumption, as might be expected from an expectations-based explanation for the saving decline.

The behavior of the real exchange rate, which appreciated in the years after 1987 (columns 7 and 8), is more consistent with the basic argument that the stabilization plan provided an initial stimulus to demand. An appreciation provides a terms of trade gain and promotes spending, followed much later by a loss of competitiveness and recession. It is argued, however, that the Mexican exchange rate began from a severely depreciated level in 1987, and that it never became overvalued relative to the longer-term average.[18] Using national accounts measures of import and export prices, Mexico's terms of trade fell 40 percent between 1980 and 1987, recovered 13 percent by 1990, and remained constant in the first half of the 1990s.

The effects of the stabilization program on saving incentives were further complicated by significant changes in the Mexican tax system, which should have increased saving incentives.

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[16]In addition, the price of consumption relative to investment goods rose about 15 percent between 1985-87 and 1992-94.

[17]This estimate of wage change is based on national accounts' measures of compensation per employee at the level of the national economy. Also, a more favorable picture is provided by the change in earning within manufacturing, where growth averaged 5 percent annually.

[18]Gil-Diaz and Carstens (1996).

The current Mexican tax system is quite advanced in incorporating minimal penalties on saving. The fundamental changes were made in the early 1980s when Mexico began to move in the direction of an indexed tax system, but additional actions were initiated in 1987 to broaden the tax base and further reduce marginal tax rates. The top-bracket rate of the personal income tax was lowered from 55 to 35 percent in 1987. The corporate tax system is fully indexed, the top rate is only 35 percent, and dividends are taxed only at their source. The government has also shifted toward greater reliance on the value-added tax, adopting a single rate of 10 percent and eliminating many prior exemptions.[19]

In summary, while the outcome of the Mexican stabilization program is consistent with the hypothesized effect of a sharp drop in private saving, it is difficult to support the argument that it operated through a decline in the return to saving. The underlying details in terms of the relative price of current versus future consumption seem to have moved in the opposite direction. Furthermore, while there was some appreciation of the real exchange rate, it was most pronounced well after the initial decline in saving. As discussed later, it is possible that the stabilization program contributed to the saving decline through other more indirect mechanisms, such as playing a contributing role in the surge of financial asset prices.

External Sector Liberalization

Mexico does stand out in the magnitude and speed with which it liberalized its international economic relations in the 1980s. It began the decade as a highly protected economy, with a very extensive licensing system on imports and tariff rates that averaged near 25 percent.

[19]The value-added tax rate was raised to 15 percent in 1995.

It also exerted very tight controls over inflows of financial capital. By 1990, it had established full capital account convertibility, most import licenses had been eliminated and the average tariff rate had been cut in half. It also experienced a tremendous increase in net capital inflows. Hypotheses have been advanced that relate the saving decline to these external account changes.

Capital Inflows. As pointed out in a recent review article by Maurice Obstfeld, there has long been a controversy in the development literature about the extent to which foreign resource inflows would lead to additional capital formation and growth versus a simple augmentation of current consumption.[20] Foreign resource inflows could depress national saving by reducing domestic interest rates, relaxing credit constraints, or, most importantly, by moderating the pressures on public officials to make painful fiscal adjustments. On the other hand, the inflow could be an induced response to perceived improvements in the profitability of domestic investment.

Between 1985-87 and 1992-94, the Mexican current account balance moved from a surplus of 1.3 percent of GNP to a deficit of 7 percent (see figure 1). When this is matched up against the decline in the Mexican national saving rate, it would seem to provide compelling evidence for those who argue that foreign resource transfers are more likely to promote consumption than to add to domestic capital formation and growth. Over the period of 1970 to 1994 there is a strong negative relationship between the national saving rate and the current account deficit. A simple regression of the national saving rate on the current account balance

[20]Obstfeld, 1995. Also, as he points out, the welfare benefits of foreign resource inflows have frequently been exaggerated by a focus on GDP instead of GNP, ignoring the fact that the owners of the foreign capital must be paid an amount roughly equivalent to their contribution to output. The domestic consequences are largely a redistribution of income from existing capital to labor.

yields a correlation coefficient of 0.7 and a regression coefficient that implies that 60 percent of any change in the net foreign inflow is absorbed by changes in consumption. As with the prior hypothesis, however, questions arise with the specification of the mechanism by which foreign resource inflows cause a decline in national saving.

Obstfeld argues that most of the existing empirical studies of the issue are severely flawed by the fact that saving, investment and the foreign inflow are all endogenous variables from which it is very difficult to infer causation. This problem is manifest in the Mexican case. Did the capital inflow play a role similar to an simple unrequited transfer in stimulating consumption, or it was a response to an fall-off in domestic saving in the presence of what foreign investors perceived to be good investment opportunities?

First, some doubts about the causal role of the capital inflows arises from noting that the inverse correlation between foreign and national saving is largely a product of the 1980s and 1990s. Up to the onset of the 1981 debt crisis Mexico had consistent current account deficits in the range of 4 percent of GNP and a rising national saving rate. After 1981, Mexico was excluded from international capital markets, and it had no choice but to generate a substantial trade surplus to meet its debt payments. The puzzle is why the experience with a net resource inflow in the 1990s differed from that of the 1970s.

Furthermore, the correlation is far less clear-cut if saving is separated into its private and public components. Prior to 1987, the foreign-sector balance was significantly correlated only with only public-sector saving, and there was no obvious relationship with private sector behavior. In the post-1987 period, exactly the opposite situation emerged, when the public saving rate remained largely unchanged and private saving collapsed. If the foreign resource inflow were

operating as an exogenously generated windfall, it should depress domestic market rates of interest or weaken public fiscal constraints. Neither of those events is evident in the Mexican case.[21] As with the stabilization policy explanation, there are problems with the transmission linkage from a foreign resource inflow to a fall in saving.

What is different about the post-1987 episode is the extent to which the current account deficit was financed with an inflow of private portfolio capital, as opposed to reliance on official borrowing and bank lending, as in the earlier period (table 7 and figure 6). And, despite all the public attention devoted to direct investment inflows, they became only slightly more important, averaging 1.5 percent of GNP in 1988-94 compared to 0.8 percent in the 1970s. In contrast, portfolio capital inflows surged from 0.6 percent of GNP in 1988 to a peak of 8.2 percent in 1993, before reversing course in 1994. Given the repressed nature of Mexican financial markets, and controls on foreign inflows, inflows of portfolio capital were trivial prior to 1990. It is possible that those inflows impacted on private markets and decisions in ways that were not possible when the funds were channeled through public institutions and direct investment in the 1970s. A large portion the portfolio capital represented investment funds from the United States that went into a relatively thin Mexican equities market. In an international context, Mexico stands out among the developing countries in its reliance on private portfolio capital inflows.[22] This issue is taken up again in a latter section on financial market developments.

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[21]As discussed in the next section, the capital inflows did occur during a period of major financial reform and liberalization. Thus, the capital inflows may have eased credit constraints without being reflected in a decline of interest rates.

[22]Brazil and Argentina also registered large inflows during the first half of the 1990s. Chile actively discouraged foreign inflows with reserve requirements and taxes. Within Asia, portfolio capital inflows have been substantial only for South Korea and then largely in the form of closed-end funds.

Trade Liberalization. Another suggestion about the possible influence of foreign sector reforms on private saving focuses on the reduction in trade barriers. Prior to the mid-1980s, Mexico imposed severe restrictions on imports, and the barriers were particularly high for consumer goods. Thus, the surge of consumption might be a response to an expansion of options for purchasing lower-cost, higher-quality imported goods. And, as shown in column (1) of table 8, the combination of liberalization and exchange rate changes has resulted in a dramatic reduction in the relative prices of imported consumption goods. The price index for imported consumption goods measured as a ratio to the price index for total consumption fell by one-half between 1987 and 1994. This is a far more dramatic change than suggested by the earlier examination of the real exchange rate. It clearly illustrates the importance of factoring the effects of trade liberalization into any consideration of the appropriateness of the exchange rate after 1987.

Furthermore, there has been a major increase in the proportion of consumption represented by imported goods. The import share, measured in constant prices, rose from 1.2 percent of total consumption in 1987 to 6.8 percent in 1994. The greater role of imports, however, should have been largely reflective of a process of substituting foreign for domestically-produced goods in response to the change in relative prices. It is not clear why it should have translated into a higher rate of overall consumption.

Some economists would classify the accumulation of consumer durables as saving. Thus, if the increased expenditures on imports were largely durable goods, they might be included within a broad definition of saving. Surprisingly, nearly all of the rise in total consumption and the imported component is in the categories of nondurables and services (table 8). In particular, there is no evidence of a rush to buy durable goods as a hedge against a resurgence of inflation. While

there was an increase in the share of GNP -- measured in 1980 prices -- devoted to durables consumption between 1987 and the 1990s, it is a reflection of a low 1987 value, not a high ratio in subsequent years (table 8). Furthermore, the durables' share of nominal GNP actually declined in the first half of the 1990s.[23]

Finally, the appreciation of the peso and the elimination of trade restrictions may have increased competitive pressures on domestic Mexican enterprises, lowering the rate of profit and business saving. Thus, the decline in the overall private saving rate could have been concentrated in the business sector. The only information from the national accounts that bears on the issue is the reported rise in the share of total value added going to capital between 1987 and the early 1990s, from 50.4 percent in 1987 to 55.7 in 1990, before declining back to about 52 percent in 1993. That would seem inconsistent with the argument that business profits were squeezed by the liberalization program.

Additional information is available from the Mexican stock exchange for those companies that are listed on the exchange. Since 1989 data are available on the profits and sales of listed companies; and, while there are significant variations in the number of reporting companies, the computed rate of profit on sales varies within a very narrow range of 12.8 percent in 1989 to 14.2 percent in 1994, with no evidence of a downward trend Given that Mexican companies pay out a very small share of profits in dividends, the change in profits should be a reasonably good proxy for the change in retained earnings. Thus, the available evidence suggests that retained earnings cannot have played a major role in the fall of the private saving rate, implying that it was

[23]The relative price of imported durables, like that of all imported consumption items, rose substantially between 1981 and 1987, and fell thereafter.

concentrated in the non-corporate and household sectors.

Financial Sector Liberalization

Since the work of McKinnon and Shaw, liberalization of the financial sector has been viewed as a way to raise the level of saving and the efficiency with which it is allocated.[24] More recently, however, the experience with financial reforms suggests that they can lead to a short-term decline in saving because the easing of prior quantity restrictions on credit.[25] The elimination of credit restrictions allows individuals to increase their borrowing against existing assets with the potential for some of the funds to spill over into consumption.[26] While much of the recent literature focuses on saving and constraints on consumer borrowing, the impacts of financial reforms appear broader in that increased access to credit also initiates a boom in housing and other asset markets, generating large capital gains as an additional stimulus to consumption. Recent examples in industrial economies are provided by the experiences of Japan and Sweden.

Much of this story also appears to apply to Mexico. It was certainly an example of a repressed financial system prior to 1987, with extensive credit controls and negative real interest rates. The structural reform program resulted in the elimination of interest rate controls, restrictions on private-sector lending , and reserve requirements. Reserve requirements were replaced by a focus on liquidity ratios where the required assets earned market interest rates.

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[24]McKinnon (1973) and Shaw (1973).

[25]McKinnon (1991) provides a useful discussion of some of the things that can go wrong. One of the more dramatic recent examples was that of Sweden in the late 1980s when financial liberalization led to a sharp increase in housing credit, an asset market boom, and a negative household saving rate.

[26]For a discussion and references see Deaton (1989).

Most of the changes took place in late 1988 and early 1989.[27] In addition, commercial banks were returned to private ownership in 1991-92, and granted permission to issue marketable securities. All this occurred in conjunction with significant relaxation of the regulations on foreign financial transactions.[28] Thus, the simultaneous liberalization of the external capital account and the internal financial system greatly increased the availability of credit to the private sector.

A summary of the changes in the balance sheet of the banking system is given in table 9. There has been a moderate growth in the ratio of total credit to GDP, as would be expected to accompany a decline in inflation and more competitive rates of return.[29] The more dramatic change, however, is in the share of credit allocated to the private sector. Prior to 1987, the banking system was largely a conduit for channeling funds from the private to the public sector. With the shift to much smaller public budget deficits and greater reliance on direct-market bond issues, public sector lending has shrunk in importance and the banking system has emerged as a major source of financing for private firms and individuals.

The outstanding stock of private-sector loans, adjusted for inflation, rose at an annual rate of 30 percent between 1987 and 1994. That was far in excess of the growth in the domestic capital stock or private-sector bank deposits. Private-sector loans soared from 8.7 percent of GDP in 1987 to 17 percent in 1990, and 41 percent by the end of 1994. By 1992, the banking system was a net supplier of credit to the private sector (figure 7). The situation changed again in

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[27]Loser and Kalter (1992)

[28]The 1989 regulatory changes substantially reduced limits on foreign ownership and broadened the range of activities in which foreign investors could participate.

[29]The sharp surge of total credit it 1994 was concentrated in the last half of the year and appears to be reflective of the growing problems of financing an outflow of private portfolio capital.

1994 when the banking system increased its dependence on foreign financing in support of a further expansion of its private sector lending. In addition, there is an obvious reversal of the pre-1988 pattern of financial dis-intermediation: the ratio of private-sector deposits to GNP rose from 16.8 percent in 1987 to 29.6 percent in 1994 (column 2 of table 9).

The credit expansion is evident in a very sharp growth in consumer credit after 1987; but the bulk of the loan expansion involved businesses and mortgages. Between 1987 and 1993, the stock of consumer credit rose from about one percent to three percent of GDP. Since the flow of consumption spending should be related to the change in the stock of debt, the growth in consumer credit alone is not sufficient to account for a large portion of the drop in saving. The more important effect would seem to be in increasing the liquidity of private sector wealth through expanding the access of private business to credit. At least for corporations, there is no evidence that the loan funds were paid out as dividends. Thus, if the expansion of credit financed a consumption boom, it did it through non-corporate business or by raising asset market prices that generated capital gains for investors. The expansion in mortgage lending is very large in 1992-94, but it appears to occurr well after the decline in saving.[30] Still, it has added to the increased liquidity of private-sector assets.

An Asset-Market Bubble.

One common effect of financial market liberalization is that it promotes large increases in asset prices. Investors are suddenly able to adopt far more leveraged portfolios as they use the

[30]The data on mortgage lending are drawn for the category "vivienda de interes social " in the Indicadores Economicos of the Banco de Mexico, and I am not certain of the the consustency of the series after 1991.

expanded access to bank debt to purchase real estate or equities. Given the thinness of the newly developing asset markets and the inexperience of financial institution managers and regulators, this type of surge in asset prices can quickly become excessive. It is also likely that the large inflows of foreign capital, made possible by the removal of capital controls, and a general atmosphere of excessive optimism also were important contributors.

In the case of Mexico, the stock market averaged *real* gains of 40 percent annually after 1987, until the market turned down in 1994 (table 10). The capitalized value of firms listed on the Mexican exchange rose from 6 percent of GDP in 1987 to 42 percent in 1993 (column 1).[31] Real estate prices collapsed in the early 1980s: an index of land prices compiled by the Bank of Mexico shows a 1987 real price of land at a fourth of its 1980 value. But, since 1987, the price collapse has been fully reversed and the real price of land is at or above that of 1980.[32] This surge in private-sector wealth stands out as the most dramatic change in the basic determinants of private saving.

A rough estimate of private-sector wealth and the influence of asset price changes is shown in table 11. Wealth is divided into three major components of net financial assets, residential housing, and non-residential capital. The residential and nonresidential capital stocks are constructed from the expenditure data of the national accounts. Initial levels of the capital stocks are based on a study by Goldsmith, and they are is assumed to depreciate geometrically.[33]

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[31]The capital value of listed firms rises faster than the index of stock prices because new firms have been added to the exchange listing. the number of new firms was growing rapidly both as a result of privatization of public enterprises and because privately-held enterprises found it very attractive to sell equities.

[32]The index of land prices was obtained from the Bank of Mexico.

[33]Raymond Goldsmith (1985). The rates of depreciation are 0.04 for residential and 0.07 for nonresidential capital.

In addition, the residential and non-residential capital stocks incorporate an allowance for land equal to 25 percent of the reproducible capital stock in 1980, adjusted in other years on the basis of the land price index of table 10. Private-sector financial assets consist of the net asset position with the banking system plus nonfinancial holdings of public debt instruments.[34] Missing from the wealth measure is an estimate of the net asset position of the private nonfinancial sector with the rest-of-world.

The measure of wealth shown in column 1 reports the wealth to GDP ratio on the basis of the cost of replacing reproducible capital. The second concept, market value, values the non-residential capital stock on the basis of the equity-market prices reported in table 10.[35] Normally, equity market prices are used only to value the stock of corporate capital less debt. However, since data are not available for the corporate sector in Mexico, the valuation adjustment is done at the level of private business.[36] In constructing the estimate of market value, the q-ratio -- the ratio of market value to replacement value -- is assumed to be unity for all of the private sector in 1980. The version shown in table 11 assumed that all private debt is business debt and multiplied the stock price index by the capital stock minus debt in the base year of 1980. An alternative assumption that all of the private debt is consumer debt implies a 1980 benchmark value of private equity equal to the capital stock. That yields a higher wealth to GDP ratio of 5.7 in 1994.

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[34]The net financial position with the banking system is included as a rough means of incorporating a portion of the private sector's transactions with the government and foreign sectors. The net position is positive in the early period because private-sector deposits were loaned to the government. It moves negative in later years because the banks raise funds abroad to lend to the private nonfinancial sector.

[35]Residential capital is valued at replacement cost with the assumption that any real capital gain is reflected in the land price index.

[36]It is assumed that the equity market price index is an accurate reflection of the change in the value of all private enterprises.

It is evident from the above calculations that the changes in asset market prices generated enormous capital gains to some investors in Mexico. Given their magnitude, it is plausible to argue that the capital gains were an important factor behind the fall in private sector saving. Using market values, private wealth rose from an average of 1.5 time GDP in 1985-87 to 4.9 in 1992-94. Even if only two percent of wealth is assumed to be consumed in each year, the above magnitude of real capital gains would be sufficient to lower the private saving rate by six percentage points over the last decade. The timing of the change in asset prices also is close to that of the decline in the private saving rate.

The major objection to the emphasis on changes in asset prices as the source of the saving decline comes from the studies that have failed to find a link between equity market prices and saving in the United States. The most recent study concluded that changes in equity market values had little or no effect on consumption.[37] Furthermore, Mexico is noted for an extreme concentration of wealth, and it can be argued that changes in wealth among a small proportion of the population and foreign investors cannot have accounted for such a large surge of consumption. Other countries, such as Japan and the newly industrializing countries of Asia have had large increases in equity markets without any evidence of large effects on consumption and saving. However, the magnitude of the capital gain in Mexico was far in excess of anything experienced in the United States; and its interaction with a new ability to borrow from the banking system may have created an consumption opportunity that did not previously exist.

[37]Poterba and Samwick (1995).

Regression Analysis

The effort to use regression analysis to distinguish among the competing hypotheses is restricted by the lack of a large data sample, measurement problems in computing both the private saving rate and the various determinants, and a high degree of colinearity among the competing explanations. While the data on the private saving rate extend over a twenty-five year period, variation in the series is dominated by the post-1987 decline. It was possible to construct data series for several potential determinants of the change in the saving rate. But three of the major candidates, bank lending to the private sector, foreign private capital inflows, and private wealth are all very highly correlated with one another: all have their largest changes in the same post-1987 period.

Some basic results of correlating the change in the inflation-adjusted private saving rate with some of the measures discussed in the prior sections are reported in table 12.[38] Initially, the private saving rate was related to the level and rate of change in income per capital and the real rate of interest on deposit accounts. There is a notable absence of any positive correlation between changes in the real rate of interest and private saving. This result follows from the negative real rates of interest that prevailed during the late 1970s and early 1980s when private saving was high, and the generally high real rates in the post-1987 period of a falling saving rate. Furthermore, unlike the results for many other countries, there is no consistent positive association between the saving rate and annual changes in income per capital.

Columns (1) - (3) of the table report the results of three alternative formulations that relate

[38]The private saving rate is derived from the economic balance concept of the budget. Similar regressions were estimated using the saving rate based on the financial balance, but they fit somewhat less well and did not imply significant differences.

the private saving rate to private wealth, foreign portfolio capital inflows, and the stock of private-sector loans, all scaled by the level of GNP. Each of these formulations fits the saving data about equally well because they share a common break in trend after 1987, but efforts to combine them result in significant problems of multi-colinearity: the simple correlation coefficients among the three measures all exceed 0.75. Equation (1) implies that wealth holders consume about 2 percent of their wealth in each period. Equation (2) implies a one-to-one trade-off between portfolio capital inflows and private saving. In the case of equation (3) the significant correlation is between the saving rate and the stock of private sector loans, rather that the change in the stock -- flow-stock rather than flow-flow. That is consistent with an interpretation of the loan variable as a proxy measure of the liberalization of the private financial system.

The wealth and foreign portfolio capital variables are combined in equation (4). The result is a modest improvement in the overall fit of the equation, but a sharp fall in the size of both coefficients. The results are quite unstable for small changes in specification, and it appears that the portfolio capital term maintains its significance primarily because it is the only variable that is correlated with the partial recovery of the private saving rate in 1993-94.[39] Other elements of the capital account balance have no significant correlation with the domestic saving rate. Thus, to the extent that foreign resource inflows impact negatively on private saving, the effect is evident only for portfolio capital.

Finally, a substantial improvement in the fit of the equation can be achieved by adding the

[39]The preference for the portfolio capital variable is even more pronounced in the regressions that are based on the alternative measure of the private saving rate derived from the government financial budget balance. As shown in figure 5, the financial balance implies a much stronger recovery of the private saving rate in 1993-94, when the rate of portfolio capital inflow slowed. For both saving rates, the portfolio capital variable loses its significance if the data period is restricted to 1971-92.

public-sector saving rate, equation (5). It implies a private offset of two-thirds of any change in government saving, and it reduces the standard error to one percent of GNP with very little effect on the other coefficients. However, as discussed earlier, this correlation is highly suspect because the private-sector saving rate is computed as a residual: there is an automatic inverse correlation between measurement errors in the public and private-sector saving. Again, the use of the primary budget balance to instrument the public-sector saving, equation 6, eliminates the correlation.

In summary, the statistical correlations provides some support for the argument that the decline in the private saving rate was related primarily to changes in financial markets -- particularly the sharp surge of asset market prices and the resulting capital gains. Domestic financial market deregulation and the large inflows of foreign capital are, in turn, plausible explanations for the rise in equity market prices that accounted for most of the surge in the wealth-income ratio**.**

Policy Implications

The question of why the Mexican saving rate declined after 1987 is of considerable importance to other countries that are considering a similar comprehensive economic reform program. While it is difficult to sort out all of the changes that were occurring in Mexico after 1987 and their effect on saving, this study suggests that the Mexican experience should not simply by categorized as another case of a consumption boom initiated by a non-credible stabilization program. By most standards the Mexican stabilization program was very successful in achieving a sustained reduction of inflation and the behavior of market interest rates was not consistent with

an interpretation that the gains were widely expected to be temporary. Instead, the Mexican consumption boom appears to have been more closely related to the financial reforms and the explosion of financial asset prices. The extent of the rise in asset prices may, in turn, be a reflection of the huge scope of the Mexican reforms and the speed with which they were implemented.

The Mexican experience suggests that reforming economies should be wary of large price increases in asset markets, induced by transitory effects of market liberalization and excessive optimism. Mexican authorities viewed the price increases in equity markets as a sign of the success of the reform program, but they also provided the seeds of the subsequent collapse. Furthermore, an open competitive financial market calls for a different type of financial regulation than that applied during the era of credit controls and allocations. Both the regulators and the market participants are likely to be quite inexperienced, and it would seem better to proceed with financial liberalization more gradually than Mexico. This is particularly true if the domestic market liberalization is combined with external capital account convertibility. The inflow of foreign capital can easily overwhelm domestic markets that are still lacking in depth. Mexico could have forced a more conservative lending policy by requiring higher capitalization of domestic banks, and it could have used a variety of tax and reserve account measures, similar to those of Chile, to discourage foreign portfolio capital inflows.

It is difficult to relate Mexico' experience directly to that of other reforming countries. Chile, the model for many of the Mexican reforms began the process with a private saving rate near zero and did not approach the Mexican saving rate until the late 1980s. In contrast, the Mexican private saving rate of the mid-1980s was among the highest of Latin America.

Furthermore, various economies in Asia-- Malaysia and Thailand in particular -- had larger current account deficits, but without notable declines in private saving. Instead, Mexico stands out more for the magnitude of change in domestic financial markets and the size of the inflows of foreign portfolio capital. The Asian countries have proceeded very slowly with liberalization of both domestic financial markets and foreign portfolio capital inflows.

In retrospect, the decline in private saving was a principal cause of the financial crisis of 1994-95. It was the major force behind the expansion of the current account deficit, and the reliance on private portfolio capital proved to be as transitory and as dangerous as the emphasis on bank finance a decade earlier. While in concept the inward transfer of resources through a current account deficit could make a positive contribution to growth, Mexico is another case where the predominant share of the foreign resource flow went to consumption not investment. Perhaps, the combination of a high and rising domestic investment rate and a foreign resource inflow can be viewed in a favorable light, but the combination of a falling domestic saving rate and a resource inflow should be viewed as a threat to sustained growth.

Finally, the extent of the fall in private saving and the increased reliance on foreign capital inflows suggest that Mexico's fiscal policy was too expansionary. In the situation in which the fall in private saving could not be reversed, the need for greater national saving could have been addressed with a larger budget surplus. It is not necessary to fully understand the reasons for the decline in private saving in order to implement a fiscal program to offset it. The effects of the fiscal restraint on aggregate demand could have easily been neutralized with a modest depreciation of the exchange rate.

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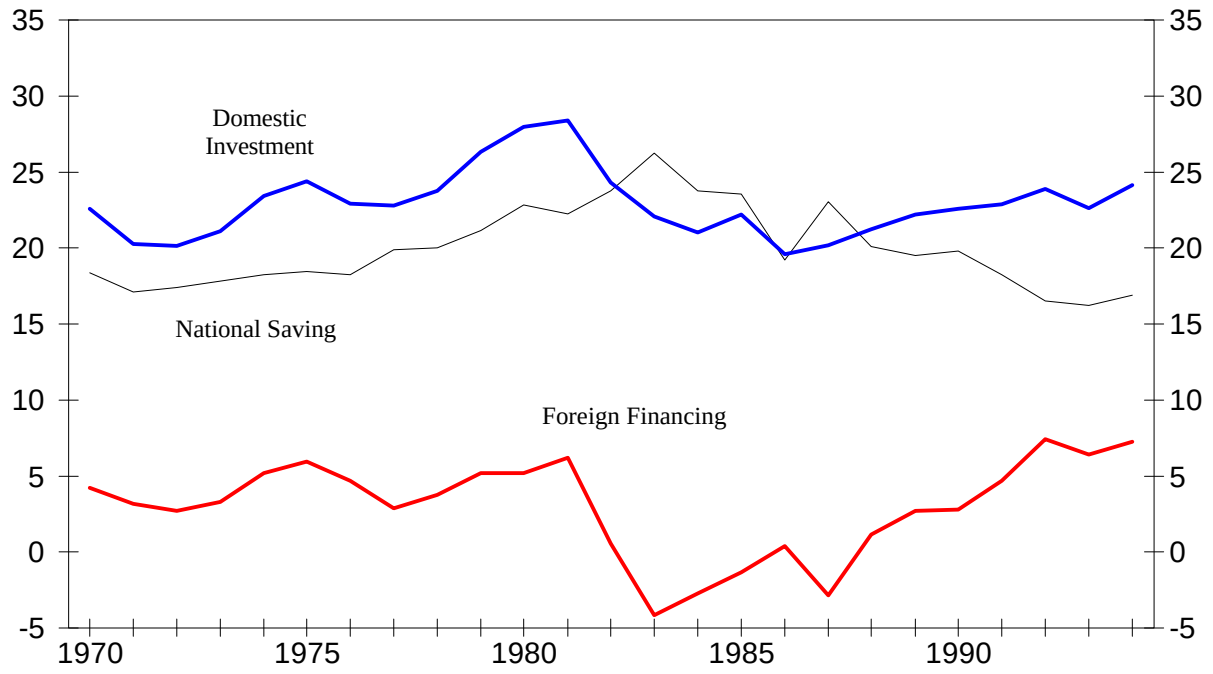
Table 1. Saving and Investment Balance, 1970-93
Percent of GNP

Category	1970-79	1980-84	1985-87	1988-89	1990-91	1992-93	1994
1. Total Saving	22.8	24.7	20.6	21.7	22.7	23.2	24.1
External Saving	4.1	1.0	-1.3	1.9	3.7	6.9	7.3
National Saving	18.7	23.8	21.9	19.8	19.0	16.3	16.9
2. Domestic Investment	22.8	24.7	20.6	21.7	22.7	23.2	24.1
Public Sector	7.5	9.7	6.4	5.1	4.8	4.3	4.3
Private Sector	13.3	13.3	13.5	14.3	14.7	16.8	16.6
Stock Accumulation	1.9	1.8	0.7	2.3	3.2	2.1	3.2

Source: INEGI and authors' calculations

Figure 1. National Saving and Investment Balance, 1970-94
percent of GNP



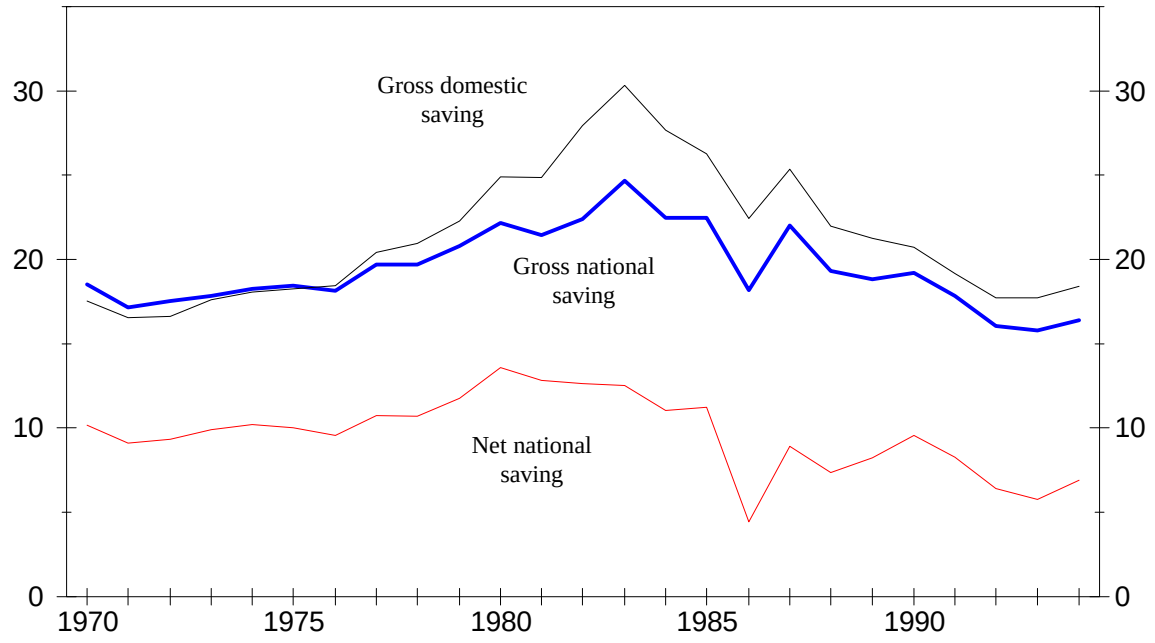
Source: INEGI and author's calculations.

Table 2. Relationship Between National Account Aggregates, 1970-94
Percent of GDP

Component	1970-79	1980-84	1985-87	1988-89	1990-91	1992-94
Gross Domestic Product	100.0	100.0	100.0	100.0	100.0	100.0
(+) net factor income	-0.2	-4.7	-4.8	-3.6	-2.5	-2.7
Gross National Product	99.8	95.3	95.2	96.4	97.5	97.3
(-) capital consumption allowances	8.5	10.1	12.7	11.3	9.6	9.7
National Income	91.3	85.2	82.5	85.1	87.9	87.6
(+) transfers	0.2	0.2	1.0	1.1	1.1	0.8
National Disposable Income	91.5	85.4	83.5	86.2	89.0	88.4
(-) private consuption	72.5	63.0	66.3	69.9	71.3	71.2
(-) public Consumption	8.9	9.9	9.0	8.5	8.7	10.8
Net National Saving	10.2	12.5	8.2	7.8	8.9	6.4
Gross National Saving	18.6	22.6	20.9	19.1	18.5	16.1
Gross Domestic Saving	18.7	27.1	24.7	21.6	20.0	18.0

Source: Instituto Nacional de Estadisitica, Geografia e Informatica de Mexico (INEGI).
The data for the 1970s were restated on a base of 1980 to maintain comparability.

Figure 2. Alternative Measures of National Saving, 1970-94
Percent of GDP



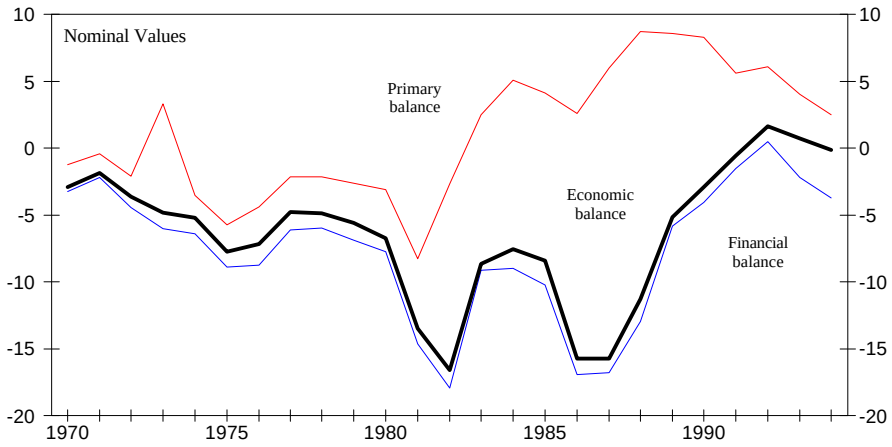
Source: See table 2.

Table 3. Alternative Measures of Public Sector Balance,1970-94
Percent of GNP

component	1970-79	1980-84	1985-87	1988-89	1990-94
Public Sector Balance	-5.0	-10.6	-13.4	-8.2	-0.3
Budgetary entities	-4.6	-9.5	-12.2	-7.5	-0.2
Federal government	-2.8	-7.8	-12.2	-7.6	-0.4
Org. and Enterprises	-1.8	-1.7	0.0	0.2	0.2
Extra-budgetary entities	-0.8	-1.1	-0.8	0.0	0.1
Difference with financial accounts	0.4	0.0	-0.4	-0.8	-0.2
Financial intermediation	1.0	1.1	1.3	1.2	2.0
Financial balance	-5.9	-11.7	-14.7	-9.4	-2.2
Economic balance	-4.9	-10.6	-13.3	-8.2	-0.2
Primary balance	-2.1	-1.3	4.3	8.6	5.3
Inflation adjusted:					
Economic balance	-3.2	-4.0	-0.5	-2.7	2.0
Financial balance	-4.2	-5.9	-2.7	-3.2	-1.1
Debt renegotiation	0.0	0.0	0.0	0.0	0.6
Privatization revenues	0.0	0.0	0.0	0.0	1.5

Source: Director General de Planeacion Hacendaria.

Figure. 3. Public Sector Budget Balance, Nominal and Inflation-Adjusted
Percent of GNP



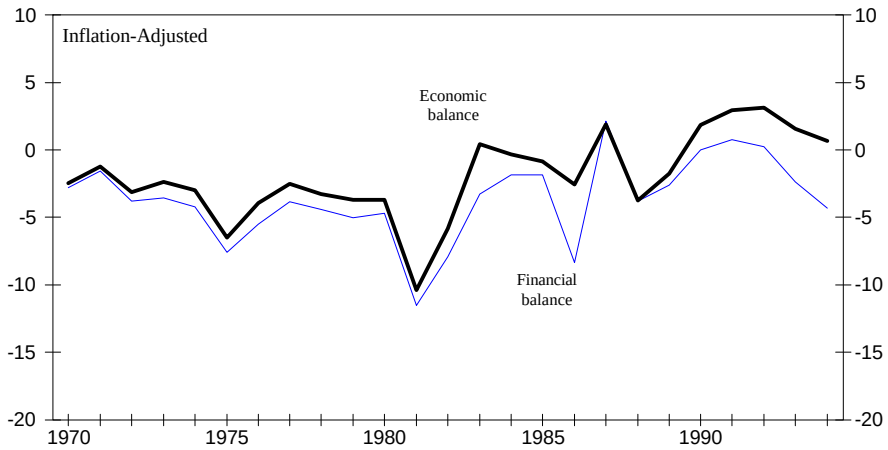
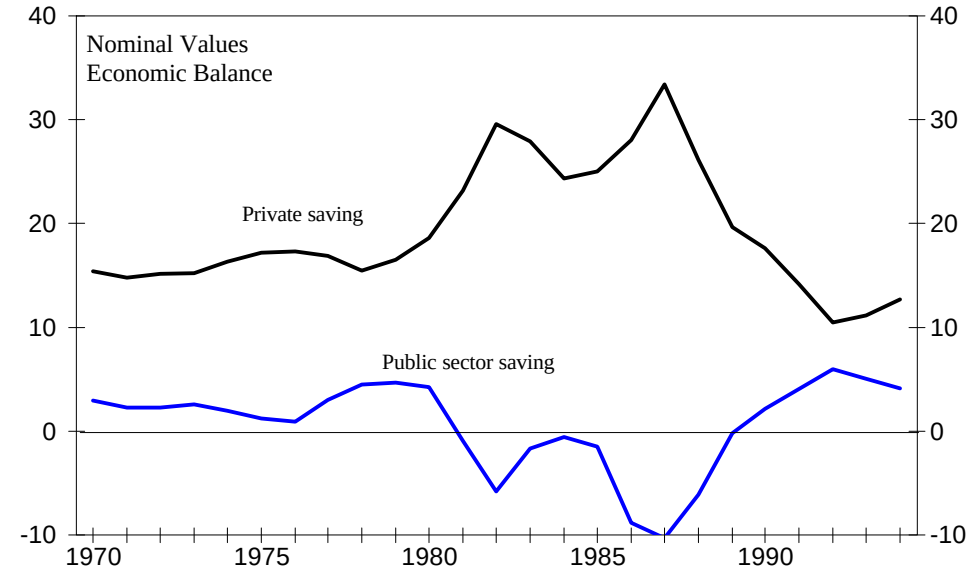


Table 4. Alternative Measures of Public and Private Saving, Nominal Values
Percent of GNP

Component	1970-79	1980-84	1985-87	1988-89	1990-91	1992-93	1994
Economic Balance:							
National Saving	18.7	23.8	21.9	19.8	19.0	16.3	16.9
Public Sector	2.6	-0.9	-6.9	-3.1	3.1	5.5	4.1
Private Sector	16.0	24.7	28.8	22.9	15.9	10.8	12.7
Financial Balance:							
National Saving	18.7	23.8	21.9	19.8	19.0	16.3	16.9
Public Sector	1.6	-2.0	-8.2	-4.3	2.1	3.5	0.6
Private Sector	17.1	25.8	30.1	24.0	17.0	12.9	16.3

Source: Author' calculations as explained in text.

Figure 4. Nominal Values of Public and Private Saving
Percent of GNP



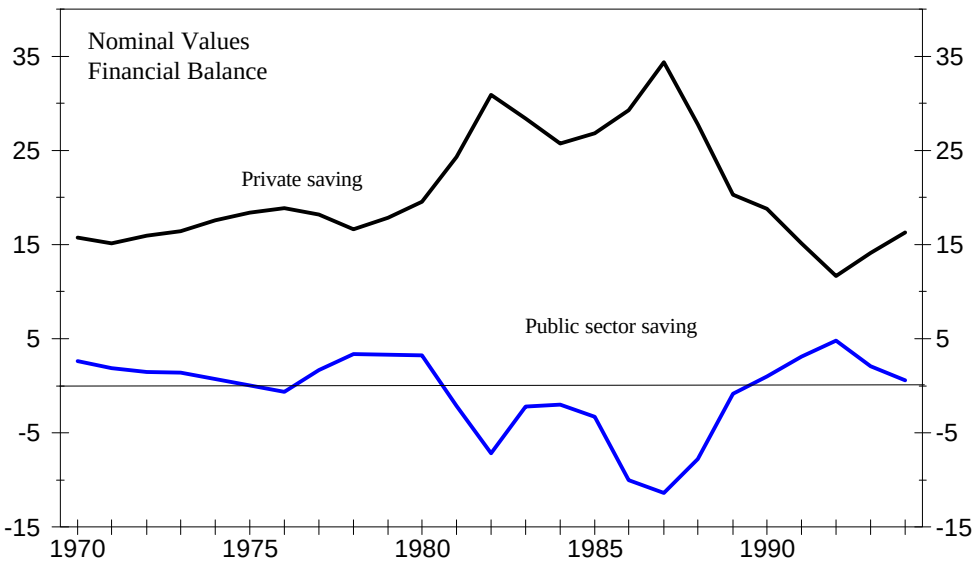


Table 5. Alternative Measures of Public and Private Saving, Inflation-Adjusted
Percent of GNP

Component	1970-79	1980-84	1985-87	1988-89	1990-91	1992-93	1994
Economic Balance:							
National Saving	18.7	23.8	21.9	19.8	19.0	16.3	16.9
Public Sector	4.3	5.7	5.9	2.4	7.2	6.6	5.0
Private Sector	14.4	18.1	16.0	17.4	11.8	9.7	11.9
Financial Balance:							
National Saving	18.7	23.8	21.9	19.8	19.0	16.3	16.9
Public Sector	3.3	3.8	3.7	1.9	5.2	3.2	-0.0
Private Sector	15.4	20.0	18.2	17.9	13.8	13.1	16.9

Source: Author' calculations as explained in text.

Figure 5. Inflation-Adjusted Values of Public and Private Saving
Percent of GNP

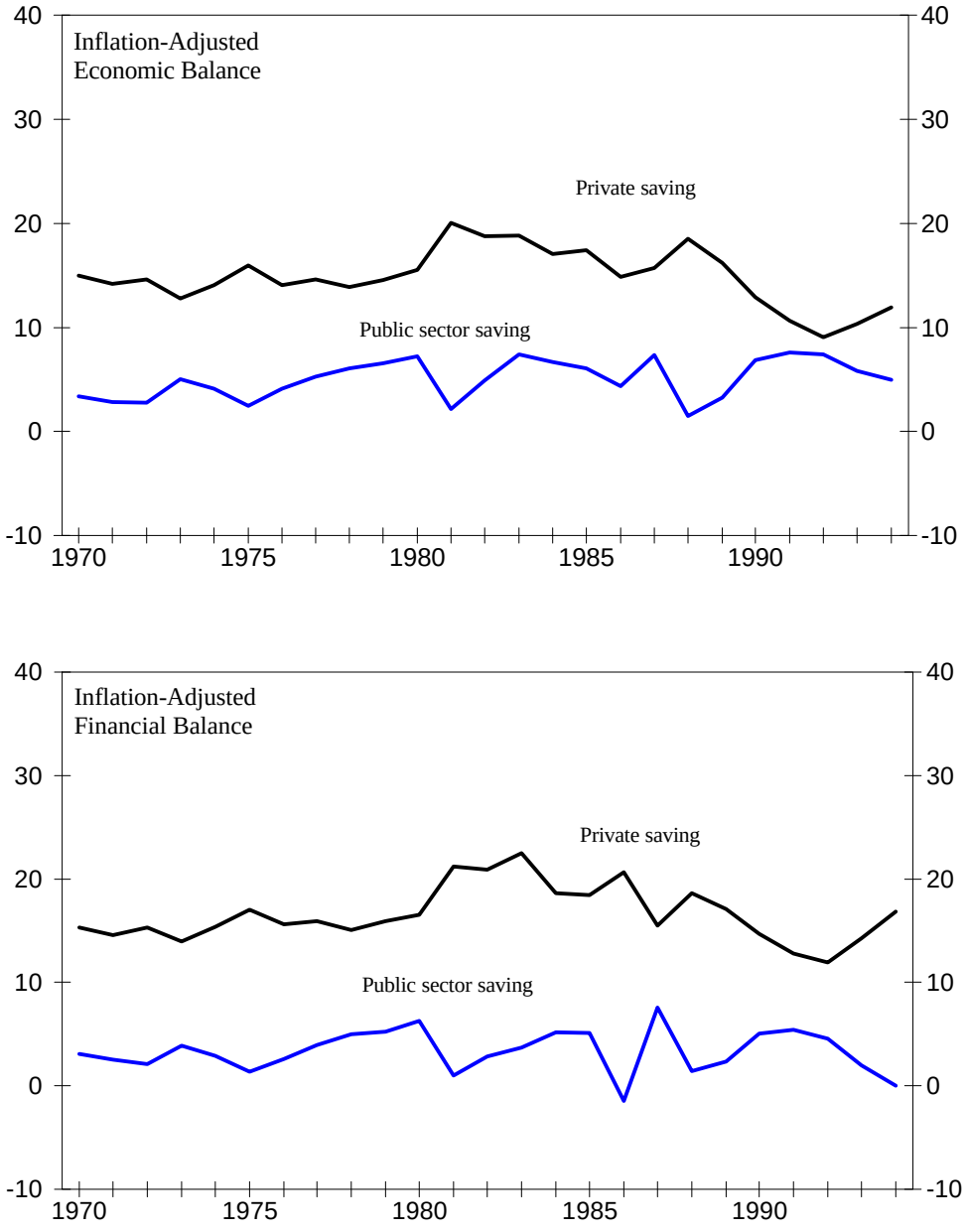


Table 6. Nominal and Real Interest Rates. 1980-94
percent, annual average

	Nominal Interest		Real Interest				Real Exchange Rate	
	Deposit Rate	Cetes 3-month	Indexed 3-year	Deposit Rate	Cetes 3-month	CPI Change	Unit Labor Costs	Morgan-Guaranty
1980	19.34	22.58		-8.04	-5.55	29.8	100.0	100.0
1981	25.58	30.85		-2.41	1.68	28.7	125.1	111.2
1982	38.53	45.73		-30.34	-26.72	98.9	84.4	80.9
1983	57.39	59.45		-12.93	-11.79	80.8	51.2	75.3
1984	48.84	49.65		-6.49	-5.98	59.2	52.3	87.9
1985	55.24	63.69		-5.20	-0.04	63.8	52.9	86.5
1986	75.91	88.71		-14.49	-8.27	105.7	34.5	61.7
1987	92.44	102.83		-25.75	-21.74	159.2	32.0	63.5
1988	52.70	63.98		0.69	8.13	51.7	38.9	76.8
1989	30.85	44.77	16.33	9.32	20.95	19.7	45.0	73.6
1990	27.88	35.03	12.57	-1.58	3.93	29.9	46.8	68.4
1991	16.57	19.82	5.81	-1.87	0.86	18.8	50.7	72.6
1992	14.48	15.89	3.20	2.27	3.53	11.9	55.0	73.7
1993	15.06	15.50	5.23	6.53	6.94	8.0	55.1	79.7
1994	13.32	14.68	5.92	5.86	7.13	7.1	50.7	76.7

Source: Bank of Mexico: Interest rates are measured net of tax. The CPI change is expressed on a Dec.-Dec. basis, Both exchange rates are converted to 1980=100, and an increase in the index represents appreciation. The Morgan-Guaranty index is trade-weighted using relative wholesale prices.

Table 7. The Mexican Current Account Deficit and Its Financing
percent of GNP

Year	Current Account Inflow	Financing				
		Reserve Asset Sales	Direct Investment Inflow	Private Finance		
				Net	Portfolio Inflow	Other Net
1979	3.9	-0.2	1.0	3.2	-0.2	3.5
1980	5.5	-0.4	1.1	4.8	0.0	4.8
1981	6.6	-0.5	1.2	5.9	0.4	5.5
1982	3.1	6.2	1.0	-4.1	0.3	-4.4
1983	-5.4	-0.6	2.0	-6.8	-0.5	-6.3
1984	-2.9	-1.5	1.1	-2.5	-0.3	-2.2
1985	-0.5	1.9	1.4	-3.8	-0.4	-3.4
1986	1.1	0.4	1.7	-0.9	-0.4	-0.5
1987	-3.1	-3.0	0.9	-1.0	-0.7	-0.2
1988	1.4	6.1	1.2	-5.9	0.6	-6.5
1989	3.0	0.1	1.4	1.4	0.2	1.3
1990	3.2	-0.9	1.1	3.0	1.4	1.6
1991	5.3	-2.8	1.7	6.5	4.5	1.9
1992	7.6	-0.5	1.4	6.8	5.6	1.2
1993	6.6	-2.1	1.2	7.5	8.2	-0.8
1994	7.9	4.8	2.2	0.9	2.2	-1.4

Source: International Financial Statistics. Other category includes bank lending and errors and ommissions.

Figure 6. The Current Account and Porfolio Capital Inflows
percent of GNP

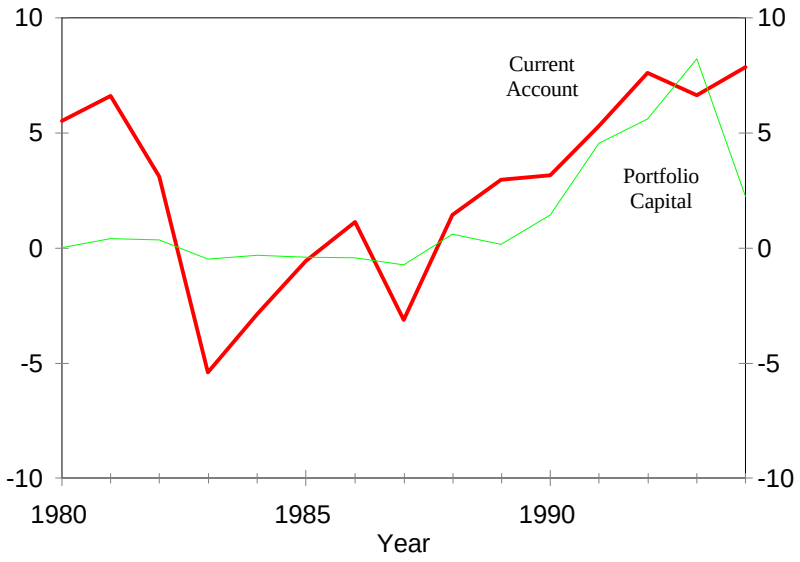


Table 8. Private Consumption and Its Components, 1980-94
Percent of GNP

Year	Relative Price of Imports	Consumption Outlays							
		Nominal Prices				1980 Prices			
		Total	Durables	Consumer Imports		Total	Durables	Consumer Imports	
				Total	Durables			Total	Durables
1980	100.0	67.0	8.8	2.5	0.8	67.0	8.8	2.5	0.8
1981	94.5	66.7	8.7	2.4	0.7	66.6	9.0	2.5	0.8
1982	109.8	65.3	7.4	1.5	0.4	66.8	7.7	1.4	0.3
1983	112.0	64.7	6.5	0.7	0.1	66.2	6.3	0.6	0.1
1984	110.6	66.7	6.7	1.0	0.1	65.7	6.4	0.9	0.1
1985	114.9	67.5	7.3	1.2	0.2	65.6	7.0	1.0	0.1
1986	142.5	72.3	7.5	1.4	0.3	66.8	6.5	0.9	0.1
1987	149.4	69.0	7.6	1.3	0.3	65.0	5.8	0.8	0.1
1988	123.8	72.1	8.0	1.9	0.6	64.8	6.2	1.3	0.4
1989	107.2	72.8	7.2	2.5	0.6	66.7	6.3	2.2	0.4
1990	98.9	73.0	7.0	3.1	0.8	67.4	6.7	2.9	0.5
1991	88.0	73.3	7.0	3.2	0.8	67.7	6.9	3.4	0.6
1992	80.9	74.1	7.1	3.6	1.0	68.7	7.2	4.2	0.8
1993	75.8	73.4	6.6	3.4	0.9	68.5	6.8	4.2	0.7
1994	75.4	72.0	6.2	3.7	1.0	68.7	6.7	4.7	0.9

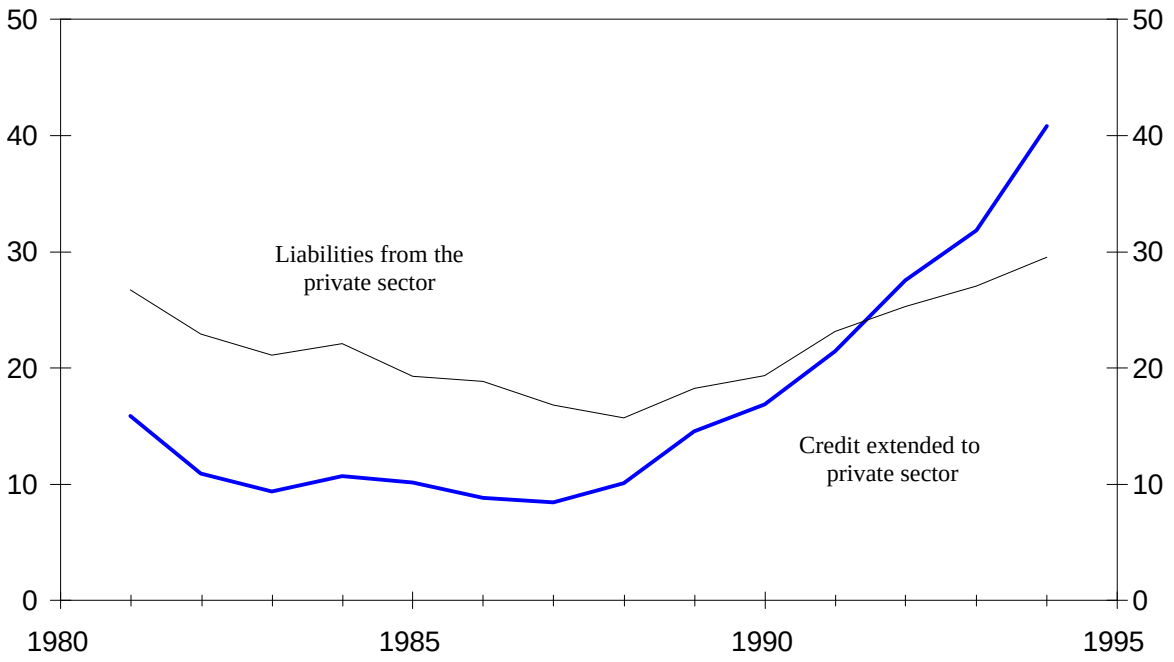
Source: INEGI, National Accounts
The price of imported consumption goods is measured relative to the price deflator for total private consumption on a base of 1980.

Table 9. Net Credit and Liabilities of the Consolidated Banking System, 1981-94
Percent of GDP

Year	Net Liabilitites				Credit Extended					
	Total	Private Sector	Nonbank Finance	Foreign	Total	Private Sector			Public Sector	Other
						Total	Consumers	Mortgage		
1981	37.5	26.7	2.1	8.7	37.5	15.9	0.8	0.9	21.7	-0.0
1982	45.7	23.0	2.0	20.8	45.7	11.0	0.6	0.6	33.9	0.8
1983	40.1	21.1	2.4	16.6	40.1	9.4	0.4	0.7	29.3	1.4
1984	37.0	22.1	2.3	12.6	37.0	10.7	0.7	1.0	24.1	2.2
1985	38.4	19.3	2.8	16.3	38.4	10.1	0.8	1.0	27.2	1.1
1986	43.5	18.9	3.3	21.4	43.5	8.8	0.6	1.0	33.1	1.7
1987	35.7	16.8	3.1	15.8	35.7	8.5	0.6	0.8	26.4	0.8
1988	32.5	15.7	3.1	13.6	32.5	10.1	0.9	1.2	22.1	0.3
1989	34.3	18.2	3.3	12.8	34.3	14.5	1.3	1.3	20.8	-1.0
1990	31.3	19.4	3.0	9.0	31.3	16.9	2.0	1.4	16.1	-1.6
1991	32.9	23.2	2.7	7.1	32.9	21.4	2.2	1.4	12.8	-1.3
1992	34.2	25.3	2.6	6.3	34.2	27.6	3.1	4.1	8.2	-1.5
1993	36.7	27.1	3.6	6.0	36.7	31.9	3.0	5.6	4.6	0.3
1994	52.2	29.6	5.0	17.7	52.2	40.8	2.9	10.9	8.6	2.7

Source: Bank of Mexico
Data are deflated by by the consumer price index for December on a base of 1980=1 and expressed as a percent of GDP in 1980 prices.

Figure 7. Bank Liabilities and Credit Extended to the Private Sector, 1980-94
Percent of GDP



Source: Table 9.

Table 10. Price Indexes for Mexican Equities and Land, 1980-94.

Year	Equity Market		Land Prices
	Capitalized Value	Stock Price	
	(Percent of GDP)	Index (1980=100)	Index (1980=100)
1980	2.2	100.0	100.0
1981	1.0	51.6	136.3
1982	0.3	18.6	116.5
1983	0.9	37.0	88.0
1984	0.9	38.4	64.8
1985	1.8	64.9	48.0
1986	4.3	132.5	39.9
1987	5.8	115.3	27.1
1988	6.6	152.0	57.2
1989	10.9	251.0	83.5
1990	13.6	290.1	95.1
1991	28.6	555.9	99.4
1992	34.5	610.0	140.5
1993	45.7	835.7	130.3
1994	42.4	712.6	131.6

Source: Mexican Stock Exchange and Bank of Mexico.
Indexes are measured on an end of year basis and adjusted for inflatic
using the consumer price index for December of each year

Table 11. Private Sector Wealth and its Components, 1980-94
End of year, ratio to GDP

Year	Total Wealth		Net Financial Assets	Residential Housing	Nonresidential Capital	
	Replacement Value	Market Value			Replacement Value	Market Value
1980	1.65	1.48	0.11	0.54	1.01	0.84
1981	1.74	1.16	0.12	0.56	1.06	0.48
1982	1.78	0.94	0.14	0.57	1.07	0.23
1983	1.80	1.06	0.13	0.59	1.08	0.34
1984	1.72	1.06	0.13	0.57	1.02	0.35
1985	1.67	1.19	0.11	0.57	0.99	0.50
1986	1.75	1.68	0.13	0.61	1.01	0.94
1987	1.72	1.55	0.13	0.61	0.98	0.81
1988	1.83	1.83	0.12	0.66	1.04	1.05
1989	1.89	2.48	0.12	0.69	1.07	1.66
1990	1.90	2.66	0.12	0.70	1.08	1.85
1991	1.89	4.11	0.09	0.71	1.10	3.32
1992	1.98	4.37	0.04	0.75	1.19	3.59
1993	2.03	5.63	0.04	0.76	1.23	4.83
1994	2.00	4.87	-0.02	0.77	1.25	4.12

Source: Author's calculations as explained in text. End of year financial stocks are deflated by the CPI of December and expressed as a percent of GdP in 1980 prices. Nonresidential capital is measured net of credit from the financial sector.

Figure 8. Private Sector Wealth, Alternative Valuations
Ratio to GDP

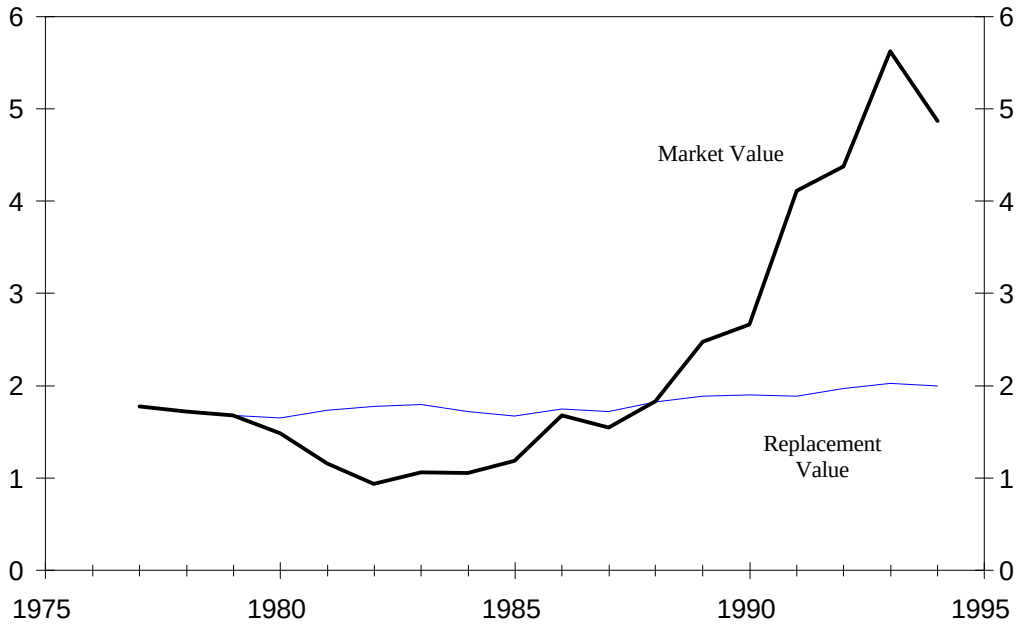
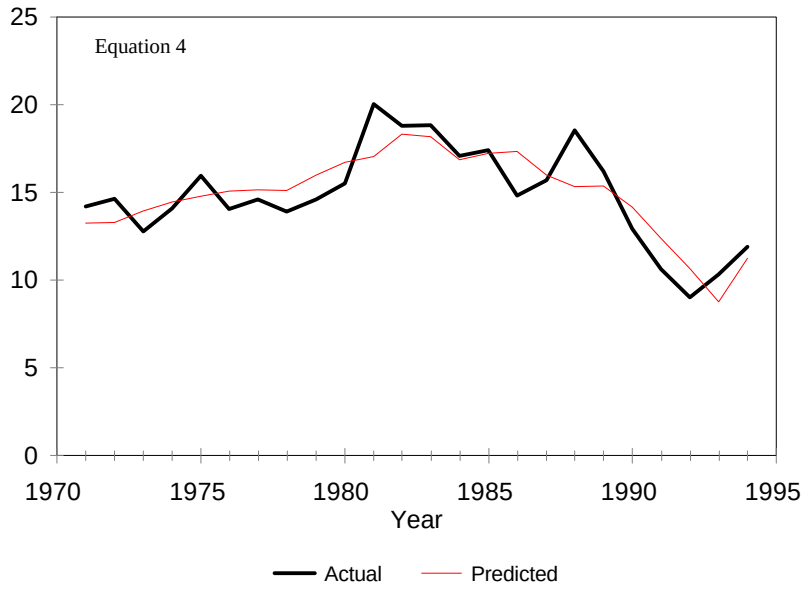


Table 12. Regression Estimates for the Private Saving Rate, 1971-94
Inflation-adjusted, percent of GNP

Independent Variables	Regression Equation: (1)	(2)	(3)	(4)	(5)	(6)
Lagged GNP/capita	0.22	0.26	0.20	0.26	0.35	0.28
	(2.8)	(3.4)	(2.3)	(3.7)	(6.4)	(3.6)
Lagged Wealth/GNP	-1.87			-0.96	-0.98	-0.97
	(5.7)			(2.2)	(3.1)	(2.2)
Portfolio capital		-1.06		-0.66	-0.57	-0.65
		(6.2)		(2.7)	(3.3)	(2.7)
Private sector loans			-0.27			
			(5.0)			
Government saving					-0.61	-0.27
					(4.4)	(0.6)
R2 adjusted	0.59	0.63	0.52	0.69	0.87	0.68
SEE	1.80	1.70	1.94	1.56	1.12	1.59
D.W.	1.39	1.95	1.30	1.73	2.2	1.7

GNP/capita - 1980 prices
Lagged wealth/GNP - market value, 1980 prices, table 11
Portfolio capital - capital inflows as a percent of GNP, table 7
Private sector loans - percent of GNP, table 9.
government saving - inflation-adjusted, (column 5, actual), (column 6, instrumented with primary balance)



Appendix table 1. National Accounts Aggregates
billions of new pesos

Year	Gross domestic product	(+) Net factor Income	Gross national product	(-) Capital Consumption allowances	National income	(+) transfers	National Disposable Income	(-) Private Consumption	(-)Public Consumption	Net national saving	Gross national saving	Gross domestic saving
1970	0.465	0.004	0.469	0.039	0.430	0.001	0.431	0.352	0.031	0.047	0.086	0.081
1971	0.514	0.002	0.516	0.041	0.475	0.001	0.476	0.393	0.036	0.047	0.088	0.085
1972	0.590	0.005	0.595	0.048	0.546	0.001	0.547	0.445	0.047	0.055	0.104	0.098
1973	0.724	0.001	0.725	0.058	0.667	0.001	0.668	0.535	0.062	0.072	0.129	0.127
1974	0.939	0.000	0.939	0.076	0.864	0.002	0.865	0.689	0.080	0.096	0.171	0.169
1975	1.149	0.000	1.149	0.097	1.052	0.002	1.054	0.829	0.110	0.115	0.212	0.210
1976	1.435	-0.007	1.428	0.123	1.305	0.002	1.307	1.024	0.146	0.137	0.260	0.265
1977	1.931	-0.018	1.913	0.173	1.740	0.004	1.744	1.344	0.193	0.207	0.380	0.394
1978	2.454	-0.035	2.419	0.221	2.199	0.004	2.203	1.693	0.247	0.263	0.484	0.514
1979	3.205	-0.053	3.152	0.289	2.863	0.005	2.868	2.167	0.324	0.377	0.666	0.714
1980	4.470	-0.129	4.341	0.384	3.958	0.006	3.964	2.909	0.449	0.607	0.990	1.112
1981	6.128	-0.217	5.911	0.527	5.383	0.007	5.390	3.945	0.660	0.785	1.313	1.523
1982	9.798	-0.558	9.240	0.956	8.284	0.017	8.300	6.036	1.026	1.238	2.195	2.736
1983	17.879	-1.055	16.824	2.176	14.648	0.045	14.693	10.881	1.574	2.238	4.414	5.424
1984	29.472	-1.618	27.854	3.359	24.495	0.076	24.571	18.590	2.722	3.259	6.618	8.160
1985	47.392	-2.122	45.270	5.331	39.939	0.329	40.268	30.575	4.374	5.319	10.650	12.443
1986	79.191	-4.255	74.937	10.871	64.066	0.871	64.936	54.209	7.208	3.519	14.390	17.774
1987	193.312	-8.849	184.462	25.284	159.178	2.332	161.509	127.268	16.996	17.245	42.530	49.049
1988	390.451	-14.588	375.863	46.763	329.101	4.319	333.419	270.998	33.741	28.680	75.443	85.712
1989	507.618	-17.511	490.107	53.637	436.470	5.145	441.616	356.900	42.915	41.801	95.438	107.803
1990	686.406	-20.369	666.037	66.239	599.798	9.922	609.720	486.354	57.799	65.568	131.806	142.254
1991	865.166	-18.165	847.001	82.703	764.298	6.598	770.896	621.208	77.971	71.717	154.419	165.987
1992	1019.160	-26.302	992.854	98.237	894.617	9.346	903.962	735.865	102.751	65.346	163.583	180.544
1993	1127.580	-30.654	1096.930	112.881	984.047	8.482	992.529	805.684	121.951	64.894	177.775	199.945
1994	1272.800	-34.499	1238.300	121.000	1117.300	9.000	1126.300	891.199	147.313	87.788	208.788	234.288

Source: INEGI. All the data is expressed on a base of 1980 in current prices.

Appendix Table 2. Components of the Public Sector Budget Balance, 1970-94
millions of new pesos

	Balance publico	Presupuestal	Gobierno federal	Organismos y empresas	Extra-presupuestal	IG-FF	Balance primario	Intermed. finan.	Balance finaciero	Balance operacional	Debt reneg. y privatization
1970	-13.6	-9.9	-8.2	-1.7	-6.0	2.3	-5.8	-1.5	-15.1	-11.6	
1971	-9.5	-9.2	-3.4	-5.8	-2.2	1.9	-2	-1.8	-11.3	-6.4	
1972	-21.5	-19.6	-14.9	-4.7	-5.0	3.1	-12.4	-4.8	-26.4	-18.6	
1973	-34.9	-32.9	-21.3	-11.6	-6.6	4.6	24.2	-8.6	-43.5	-17.3	
1974	-48.7	-41.9	-27.1	-14.8	-11.8	4.9	-33.3	-11.6	-60.3	-27.9	
1975	-88.9	-83.3	-43.8	-39.5	-13.4	7.8	-66	-13.4	-102.3	-74.8	
1976	-102.7	-98.2	-61.7	-36.5	-15.3	10.8	-63.1	-22.1	-124.8	-56.2	
1977	-91.3	-97.4	-61.7	-35.7	-4.5	10.8	-40.7	-25.2	-116.6	-48.1	
1978	-117.5	-121.4	-67.1	-54.3	-7.4	11.3	-51.4	-27.4	-144.9	-79.5	
1979	-176.2	-167.1	-101.4	-65.7	-24.8	15.7	-82.8	-41.6	-217.8	-116.6	
1980	-292.6	-249.9	-133.1	-116.8	-41.9	-0.8	-133.9	-43.3	-335.9	-160.9	
1981	-797.1	-726.7	-399.8	-326.9	-70.4	-0.2	-489.8	-69.1	-866.2	-612.8	
1982	-1531.8	-1253.0	-1170.3	-82.7	-190.3	-88.5	-246.6	-128.5	-1660.3	-538.9	
1983	-1455	-1489.0	-1458.2	-30.8	-143.0	177.0	423.6	-85.6	-1540.6	71.5	
1984	-2105.8	-1875.1	-2130.5	255.4	-218.2	-12.6	1414.6	-399.0	-2504.8	-88.4	
1985	-3808.9	-3336.0	-3581.4	245.4	-448.3	-28.6	1880.6	-726.3	-4635.2	-379.1	
1986	-11804.8	-10463.0	-10341.0	-122.0	-1352.1	10.3	1962.4	-880.8	-12685.6	-1908.9	
1987	-29060.6	-27438.1	-27466.5	28.4	-449.2	-1173.3	11034.4	-1939.4	-31000.0	3470.4	
1988	-42479.3	-36668.3	-37844.6	1176.3	-405.6	-5405.4	32741.2	-6255.2	-48734.5	-14013.3	
1989	-25268.1	-26146.8	-25589.3	-557.5	591.8	287.1	41938.3	-3186.9	-28455.0	-8562.4	
1990	-19266.2	-16515.1	-19435.6	2920.4	1074.0	-3825.0	55131	-7648.3	-26914.4	12220.6	20063.1
1991	-4724.5	-1572.7	-701.1	-871.6	419.2	-3571.0	47489.3	-8257.4	-12981.9	24664.3	29913.8
1992	16361.2	16067.6	15959.0	108.5	881.0	-587.4	60415.7	-11430.8	4930.3	30836.8	30123.7
1993	8242.8	8546.1	4156.1	4390.0	-141.2	-162.1	43989.5	-31975.7	-23732.9	17135.8	0
1994	-1734.9	-4473.6	-9927.6	5454.0	575.9	2162.8	31118.5	-44255.6	-45990.5	8260.4	5081.2

Source: Director General de Planeacion Hacendaria.