October 2001
IMF Country Report No. 01/191

Mexico: Selected Issues

This Selected Issues paper for Mexico was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on **July 19, 2001.** The views expressed in this document are those of the staff team and do not necessary reflect the views of the government of Mexico or the Executive Board of the IMF.

The policy of publication of staff reports and other documents by the IMF allows for the deletion of market-sensitive information.

To assist the IMF in evaluating the publication policy, reader comments are invited and may be sent by e-mail to Publicationpolicy@imf.org.

Copies of this report are available to the public from
International Monetary Fund • Publication Services
700 19th Street, N.W. • Washington, D.C. 20431
Telephone: (202) 623 7430 • Telefax: (202) 623 7201
E-mail: publications@imf.org • Internet: http://www.imf.org

Price: $15.00 a copy

International Monetary Fund
Washington, D.C.

INTERNATIONAL MONETARY FUND

MEXICO

Selected Issues

Prepared by Western Hemisphere Department in Collaboration with Other Departments

Approved by Western Hemisphere Department

July 19, 2001

Contents Page

Figures

Figures

Statistical Appendix Tables

GLOSSARY

CES	Constant Elasticity of Substitution
CPI	Consumer Price Index
FOVISSTE	Mexican Housing Fund
GFS	Government Finance Statistics
IMSS	Mexican Social Security Institute
INEGI	National Institute of Statistics and Geography
IPAB	Bank Savings Protection Institute
NAFTA	North American Free Trade Agreement
NAIRU	Non-Accelerating Inflation Rate of Unemployment
NFL	Net Foreign Liabilities
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
PIDIREGAS	Public Investment Projects Financed and Executed by the Private Sector with Deferred Budgetary Impact
RER	Real Exchange Rate
VAR	Vector Autoregression
VAT	Value Added Tax

Mexico: Basic Data

I. Social and Demographic Indicators

Area (thousand sq. km)	1,909	Nutrition (1997)	
Arable land (percent of land area)	13	Calorie or protein intake (per capita a day)	3,097
Population (1999)		Health (1998)	
Total (million)	97	Population per physician	1,600
Annual rate of growth, 1999		Population per hospital bed	1,100
(percent a year)	1.4		
Density (per sq. km.)	50.6		
GDP per capita (US$), 2000	5,604	Access to electricity (most recent year)	
		Percent of dwellings	95.0
Population characteristics (1999)		Urban	...
Life expectancy at birth (years)	72	Rural	...
Crude birth rate (per thousand)	27		
Crude death rate (per thousand)	5	Access to safe water (1990-98)	
Infant mortality (per thousand live births)	29	Percent of population	95.0
Under 5 mortality rate (per thousand)	36		
Income distribution (1998)			
Percent of income received:		Education (1999)	
By highest 10 percent of households	34.8	Adult literacy rate	91.1
By lowest 20 percent of households	6.8	Gross enrollment rates, in percent (1998)	
Gini coefficient	40.5	Primary education	114.0
		Secondary education	64
		Tertiary education	16
		GDP (2000) (in billion of Mexican Pesos)	4,623
		(in billion of U.S. dollars)	575

II. Economic Indicators, 1996-2000

	1996	1997	1998	1999	Prel. 2000
	(In percent of GDP)				
Origin of GDP					
Agriculture and mining	7.3	6.9	6.6	6.5	6.3
Manufacturing and construction	22.5	23.3	23.6	23.7	23.7
Services	70.2	69.9	69.8	69.7	70.0
	(Annual percentage changes, unless otherwise indicated)				
National accounts and prices					
Real GDP	5.2	6.8	5.0	3.7	6.9
Real GDP per capita	3.4	5.0	3.2	1.9	5.1
GDP deflator	30.7	17.7	15.3	15.1	10.7
Consumer price index (period average)	34.4	20.6	15.9	16.6	9.5
Consumer price index (end of period)	27.7	15.7	18.6	12.3	9.0
Unemployment rate (in percent)	5.5	3.7	3.2	2.5	2.2
	(Ratios to GDP)				
Gross domestic investment	23.1	25.9	24.3	23.6	23.3
Of which : public investment	3.0	3.1	2.6	2.9	4.0
Gross national savings	22.4	24.0	20.4	20.7	20.2
External savings	-0.7	-1.9	-3.8	-2.9	-3.1
Private consumption	65.1	64.3	67.3	67.1	67.5
Public consumption	9.6	9.9	10.4	10.9	11.0
Nonfinacial public sector					
Adjusted revenue	21.8	22.1	20.0	20.4	21.4
Augmented expenditures	32.9	29.0	28.1	27.5	25.4
Of which:					
Interest	7.8	7.1	7.1	7.8	6.1
Bank support programs 1/	6.7	2.0	1.4	0.3	-0.6
Augmented primary balance 2/	-3.2	0.2	-1.0	0.7	2.1
Augmented overall balance	-11.0	-6.9	8.1	-7.1	-4.0
Traditional overall balance	0.3	-1.1	1.2	-1.1	-0.9

Mexico: Basic Data

	1996	1997	1998	1999	Prel. 2000
	(12-month percentage changes, unless otherwise indicated)				
Money and credit					
Liabilities to private sector	30.1	19.1	21.6	16.8	4.9
Of which :					
Money	22.2	27.1	23.1	41.6	10.9
Quasi money	30.9	18.2	21.4	14.0	4.2
Net domestic assets of the banking system	10.9	0.1	19.3	9.8	3.5
Of which :					
Credit to the public sector (net)	8.8	-4.2	13.2	-3.8	4.1
Credit to the private sector	-16.2	17.6	15.3	0.4	-2.1
Liabilities to private sector, in percent of GDP	31.7	30.0	30.2	29.6	27.7
Treasury bill rate (28-day cetes, in percent, annual average)	31.4	19.8	24.8	21.4	15.2
	(In billions of U.S. dollars, unless otherwise indicated)				
Balance of payments					
Current account	-2.3	-7.4	-16.1	-14.1	-18.1
Merchandise trade balance	6.5	0.6	-7.9	-5.6	-8.0
Exports	65.5	74.1	74.9	86.0	104.7
Imports	59.0	73.5	82.8	91.6	112.7
Services and transfers (net)	-8.9	-8.1	-8.2	-8.5	-10.1
Of which : interest (gross)	13.4	12.4	12.5	13.0	14.0
Capital and financial account	7.6	19.3	18.4	19.3	22.3
Foreign direct investment	9.2	12.8	11.3	11.9	13.3
Portfolio investment	0.5	-0.7	-0.8	-0.8	1.3
Other capital (net)	-2.1	7.1	7.9	8.3	7.8
Errors and omissions	1.1	1.7	1.3	-1.4	4.0
Change in net international reserves	6.3	13.5	3.7	3.9	8.2
Exports (in percent of GDP)	19.7	18.5	17.8	17.9	18.2
Imports (in percent of GDP)	17.7	18.3	19.7	19.1	19.6
Current account (in percent of GDP)	-0.7	-1.9	-3.8	-2.9	-3.1
Merchandise exports (in US$, annual percentage change)	22.7	13.1	1.1	14.8	21.8
Merchandise imports (in US$, annual percentage change)	27.0	24.6	12.7	10.6	23.1
Terms of trade (annual percentage change)	0.0	-1.6	-5.5	4.8	5.9
Real effective exchange rate (12-month percentage change)	13.0	17.8	1.9	9.0	10.0
International reserve position and external debt (as of December 31)					
Gross official reserves	19.6	28.9	31.9	31.9	35.6
(in months of imports of goods and services)	3.2	4.2	4.2	3.4	3.6
Net official reserves	6.3	19.8	23.5	27.4	35.6
Net reserves of the banking system	2.6	4.1	6.8	7.3	9.8
Outstanding external debt, in percent of GDP	49.6	38.2	38.4	34.7	26.0
Public	33.6	24.3	23.9	20.2	14.7
Private	16.0	13.9	14.4	14.5	11.3
Total debt service ratio (in percent of exports of gds. & serv.)	64.3	62.6	47.9	43.9	42.1
Of which : interest	16.5	13.7	13.5	12.5	11.1
Gross reserves/short-term debt (in percent)	33.1	64.1	69.6	74.6	89.8
IMF data (as of May 31, 2001)					
Membership status:					Article VIII
Intervention currency and rate					U.S. dollar at Mex$9.0851
Quota					SDR 2,586 million
Fund holdings of Mexican pesos					SDR 2,585 million
(as percent of quota)					100 percent
Outstanding purchases and loans					none
SDR department					
Net cumulative allocation					SDR 290 million
Holdings					SDR 283 million

Sources: Mexican authorities; and Fund staff estimates.

1/ Includes debtor-support programs, bank restructuring costs, and financial requirements of developments banks.

2/ Treats bank-support programs as interest payments.

I. Potential GDP in Mexico[1]

A. Introduction

1. In most countries, over a sufficiently long time period, economic growth shows two distinct characteristics—a stable, upward trend in output and some variation in output around that trend. In Mexico, these features are also present, although the fluctuations have on occasion been so pronounced that they have jeopardized the sustainability of growth. Thus, the identification of the distortions that generate such deviations from trend is central to designing an appropriate macroeconomic policy framework.

2. The characterization of policies as either procyclical or counter cyclical depends on the stage of the business cycle in which the economy finds itself. For example, a restrictive monetary policy would be considered procyclical in a phase of decelerating growth since it would accentuate the contraction in aggregate demand. In contrast, the same policy would be considered counter cyclical in an expansion phase, as it would tend to attenuate the expansion in aggregate demand.

3. The importance of knowing with precision the phase and characteristics of the business cycle of an economy has motivated various lines of research in the literature. The first systematic study of the business cycle was that of Burns and Mitchell (1946). They treated each cycle as a separate episode, which had an expansion phase, in which the economy moved from a "valley" to a "peak," and a contraction phase, in which the economy moved from a peak to a valley. The business cycle was then characterized by the average length of its expansion and contraction phases, the amplitude of its fluctuations, and by the behavior of other economic variables over the cycle period.

4. Burns and Mitchell defined a recession for the U.S. economy as an episode in which there was a substantial decline in economic activity for a representative group of productive sectors that lasted more than three consecutive months. This definition was later refined, giving rise to the empirical rule of thumb that a recession exists when economic growth is negative for two consecutive quarters.

5. The methodology of Burns and Mitchell was eventually discarded because it was considered subjective and because the data series that it generated did not have sufficiently well defined statistical properties. Currently, the analysis of economic fluctuations assumes that the variables follow a linear stochastic process with constant coefficients. This new focus has permitted a greater integration of macroeconomic and econometric theory.

6. The Keynesian approach, and later the monetarist approach, became the principal theoretical models for the design of economic policies aimed at affecting the evolution of economic variables, and hence their fluctuations. Assuming that monetary and fiscal autho-

---

[1] This chapter was prepared by staff of the Mexican Secretariat of Finance and Public Credit (Ernesto Acevedo, Marlon Aguilar, and Andrés Conesa) and of the IMF (Philip Young). The opinions expressed in this paper by the staff of the Mexican Secretariat of Finance and Public Credit do not necessarily reflect the official views of the Secretariat.

rities could influence the interaction of economic agents, the volatility of economic activity could be reduced, while its growth rate could be boosted. The existence of market imperfections is another argument, developed more recently, to justify active policy intervention.

7. Although the macroeconomic theory developed in the context of these models justified the use of procyclical and counter cyclical policies to limit the negative effects of economic volatility, Prescott (1986) indicated that the authorities' capacity to influence such effects was minimal. His work suggested that economic fluctuations in the industrial countries existed principally because of random disturbances to total factor productivity.[2] The most striking point made by Prescott was the irrelevance of certain counter cyclical policies since, according to the evidence, the characteristics of the observed fluctuations of the U.S. economy would not have been significantly different in the absence of such policies. Furthermore, according to Prescott, the cost of implementing such policies, on more than one occasion, had been greater than the benefits.[3]

8. Prescott's work stirred an important debate about the nature and effects that random disturbances have on output growth, including the search for better ways to measure such effects. In the last 20 years, a number of econometric techniques have been formulated to identify separately the cyclical and permanent components of economic series. Such a decomposition enables identification of the characteristics of economic fluctuations and, at the same time, evaluation of the efficacy of economic policies.[4]

9. This paper will focus on the Mexican economy, which has seen important output fluctuations, whose characteristics and determinants merit further research. Real GDP growth averaged nearly 7 percent during 1950–81, a period of over 30 years. Following the debt crisis of the early 1980s, there was a distinct downward shift in the growth rate, with real GDP growth averaging a mere 1.3 percent during 1982–95, a period which saw a variety of internal and external shocks.[5] The high degree of fluctuations experienced in the past complicate the estimation of potential output growth in Mexico. The identification of

---

[2] Plosser coined the term "real business-cycle theory" to designate those models that attached a relatively greater weight to changes in total factor productivity as the main determinants of output fluctuations.

[3] Although real business-cycle theory argues for the design of policies that reduce the volatility of total factor productivity, financial crises have imposed a different sort of challenge in that the necessary correction to counteract any financial disequilibrium needs to be effective almost immediately, while the suggested policies from the above-mentioned models take longer to be effective.

[4] Although Prescott concluded that monetary policy didn't affect real business cycles, Lucas (1994) disagreed. He argued that the success of real business cycle theory in explaining economic fluctuations should be "interpreted as evidence that postwar monetary policy has resulted in near-efficient behavior, not as evidence that money doesn't matter."

[5] Barry Bosworth (1998) found a notable decline in trend productivity growth in Mexico during the 1980s.

permanent and cyclical components of growth cycles is central to this exercise. Knowing potential output growth, and the stage of the cycle, are two important pieces of information that policymakers require in designing the appropriate stance of monetary and fiscal policies.

10. The econometric techniques presented in this paper aim at decomposing the GDP[6] series in a statistically efficient manner. In this context, given an estimate of the magnitude of output fluctuations, the paper also aims at relating the business cycle to other economic variables. The paper aims at identifying key links between policies and economic variables in order to be able to consolidate the benefits of economic expansions, offset the negative effects of contraction phases, and more broadly, contribute to the design of policies that lay the foundations for sustainable growth.

11. It should be noted that some of the econometric techniques employed in this paper assume certain theoretical properties that may not fully exist in the Mexican economy such as full information and completeness of markets. Nonetheless, the results obtained appear to be quite robust. Thus, the exercise described in this paper should contribute to a better understanding of potential output growth in Mexico.

12. This chapter describes various econometric procedures and different analytic specifications to determine the characteristics of a time series and decompose it into its cyclical and trend components. The chapter is structured as follows. Section B provides a description of the general procedures used to extract the various components of the real GDP series. Section C summarizes the estimation results of the cyclical and permanent components of GDP and compares the results obtained through the various procedures. A key result is that the magnitude of potential GDP growth and the output gap was similar under two out of the three methodologies employed. Section D concludes.

B. Techniques to Estimate Potential GDP and the Output Gap

13. A number of analytical tools exist that help to identify business cycle traits. In particular, the deviations from trend observed during contraction and expansion phases have been classified according to various criteria,[7] in order to not only identify those policies needed for sound growth, but also those policies needed to deal with various contingencies.

14. A by-product of estimating the characteristics of business cycles is the ability to identify the excess demand, or output gap, in any given time period. The output gap measures the difference between actual and potential output, both in log terms. In this manner, the rate of long-term sustainable growth, consistent with the availability of technological and productive factors, can be estimated. The existence of an output gap, either positive or negative, implies an allocation of resources that is not efficient and can generate market distortions.

---

[6] GDP throughout this chapter refers to real GDP.

[7] The factors that cause fluctuations in aggregate demand and supply are classified in three categories: 1) domestic factors, such as trend changes in employment or inflation; 2) external factors, such as sudden changes in the nominal exchange rate or the terms of trade; and 3) structural factors such as technological changes or productivity shocks.

15. Burns and Mitchell argued that there is a deterministic decomposition of GDP, with which certain indicators of GDP can be identified. This analysis gave rise to the one of the most commonly used techniques for forecasting economic cycles—the study of leading indicators. However, the work of Nelson and Plosser (1982) showed the advantage of examining stochastic trends in time series to identify their characteristics. Consequently, much research has been aimed at establishing techniques that rely on the consistency between the theoretically predicted economic properties of time series and the time series properties obtained through a stochastic decomposition.[8]

16. Given that the business cycle can behave in a myriad of ways, including exhibiting high volatility, it is difficult to formulate techniques that identify adequately all of its characteristics and, at the same time, satisfy the conditions of a stochastic decomposition. However, since the properties of the permanent component of a time series tend to be more homogeneous, most techniques focus on identifying the trend component and obtain the cyclical component as a residual.

17. Traditionally, two types of models have been used to estimate potential GDP. One type defines potential output as the level of production that would be observed if the economy were at its natural rate of unemployment.[9] Potential output is then usually determined on the basis of estimates of production functions.

18. The second type of model is based on the assumption that the behavior of the permanent component of GDP is influenced primarily by exogenous shocks that affect aggregate supply and thus determine the magnitude of the deviation between potential and observed GDP. In this model, the business cycle is not necessarily due to changes in aggregate demand or to the path of certain variables that could affect the productive capacity of the economy. Instead, the business cycle is a function of the decisions taken by economic agents regarding the optimal allocation of resources each time there is an unexpected productivity shock.

19. The latter type of model identifies potential output as synonymous with trend output, which is estimated based on the observed GDP time series. The key challenge is to formulate techniques that permit the identification of temporary versus permanent shocks.

20. In practice, few procedures can be classified as falling solely under one or the other of the above strands of models, but instead have elements of both. Deficiencies in the satisfactory identification of the components, as well as the sensitivity of the results to the estimation technique, have motivated a number of hybrid experiments. These experiments, to a greater or lesser degree, incorporate certain restrictions implied by the economic models. In the remainder of this section, the qualitative characteristics of the main procedures found in the literature are described.

---

[8] Such a decomposition is nontrivial considering, for example, that time series which are co-integrated of order one can have an infinite number of cyclical/trend decompositions.

[9] The rate of unemployment at which there is no upward pressure on the price level.

The Hodrick-Prescott filter

21. The HP filter[10] (Hodrick and Prescott, 1997) is a technique for smoothing time series that identifies the permanent component of a series through the solution of the following procedure:[11]

$$\{ y^*_t \} = argmin \sum (y_t - y^*_t)^2 + \lambda \sum [(y^*_{t+1} - y^*_t) - (y^*_t - y^*_{t-1})]^2$$

where λ determines the degree of smoothing of the permanent component, and y_t and y^*_t represent current and potential output, respectively.[12] Hodrick and Prescott propose values for λ of 100, 1600, and 14400 for data with annual, quarterly, and monthly frequencies.

22. The HP filter is linear in two stages. In the first stage, the series is differenced, and in the second stage it is smoothed. The technique uses information related to the behavior of those fluctuations lasting between 6 and 32 quarters, which are consistent with the definition of the business cycle proposed by Burns and Mitchell.

23. One shortcoming of the HP filter is that the choice of the parameter λ often is not well related to the characteristics of the time series to be decomposed.[13] Another shortcoming

---

[10] The HP filter is a procedure that removes low frequencies (high-pass) from a time series. Filters that remove low and high frequencies (band-pass), such as that proposed by Baxter and King (1995) have properties similar to those of the HP filter. For this reason, they are not discussed in detail in this chapter.

[11] A number of analytic frameworks permit the identification of the specific characteristics of an economic time series. Traditionally, emphasis is given to properties of a time series such as its mean and variance. However, time series have other characteristics that can be better seen using alternative perspectives or domains. The frequency domain allows the identification of qualitative indicators of the time series, related directly to its components, such as the amplitude, length of cycle, and frequency. Another alternative is the state-space domain. Under this domain it is quite straightforward to identify characteristics of a time series, hence its growing popularity in the analysis of stochastic processes. The solution to the procedure expressed here is obtained through state-space domain optimization techniques.

[12] Although the terms "filter" and "smoother" are often used interchangeably, technically they are different. Filters recreate a series by filtering the observations one by one. A smoother takes into account the full information set before smoothing the series. Under this definition, the HP filter behaves more like a smoother than a filter.

[13] The values suggested by Hodrick and Prescott for λ correspond to the ratio of the variance of the cyclical component to the variance of the permanent component. These values are very sensitive to the characteristics of the series to be decomposed. For that reason, the appropriate use of the HP filter requires the estimation of λ in the specific case of Mexico's GDP series. Rotemberg (1999) has proposed a two-stage procedure that yields, first, an optimal λ, and second, the corresponding permanent component of the series.

of the HP filter is related to the distortions in the filter at the endpoints of the sample. Owing to the initial and ending conditions imposed by the filtering process, the HP filter tends to dampen the endpoints in the series being detrended and not capture the full effects of permanent shocks resulting from recent structural reforms (such as the implementation of NAFTA beginning in 1994).

24. Finally, some authors have argued against the use of an HP filter because it does a poor job of replicating the properties of an ideal filter in small samples. It should also be noted that even if the HP were to perform as an ideal filter does, if the characteristics of the series' spectrum are similar to those identified by Granger (1966), then the behavior of any filter (high-pass or band-pass) is technically poor.

The method of nonobservable components

25. This method attempts to measure nonobservable components, such as potential output or the NAIRU (non-accelerating inflation rate of unemployment), based on a set of observable variables and the implied relationships that help to identify the former components. The representation used to designate dynamic processes, known as "state-space," allows for very general, but explicit specifications to model a wide variety of such processes.

26. A popular decomposition process that relies on nonobservable components techniques is that proposed by Beveridge and Nelson (1981). This specification assumes that potential output is a nonobservable variable that can be characterized by a pair of components. The first component has a random walk with drift, intended to capture the long-run trend of GDP. The second component is characterized by a stationary autoregressive process, and provides information about the persistence of short-run fluctuations of GDP.

27. The characteristics of the decomposition proposed by Beveridge and Nelson depend, to a large extent, on the goodness of fit the ARIMA can obtain. In GDP series, which are usually integrated of order one, the ARIMA specification has minimal capacity to forecast output fluctuations. This is because of the use of partial information (only past growth rates of GDP are considered) to characterize fluctuations. The ARIMA specification tends to indicate relatively small magnitude business cycles, which are very sensitive to the addition of new information.

28. Watson (1986) and Quah (1992), among others, have criticized the use of the above decomposition, because it imposes characteristics on the cyclical and permanent components that are not corroborated under other specifications, or that are not in concordance with the theoretical implications of the real business-cycle literature.

29. Univariate nonobservable components techniques exist which yield a decomposition that allows for the independence between the cyclical and permanent components.[14] This

[14] The benefits of this property are specific to the model. In some models of business cycles, it would be inconsistent to assume independence between the cyclical and permanent components.

allows the identification of distinct shocks that might affect only one of the components, which is not possible in the BN model.

30. The use of multivariate nonobservable components techniques has made it easier to estimate simultaneous economic relationships (Rotemberg and Woodford, 1996).[15] A specific example of the use of such a technique is the estimation of potential output and the NAIRU through a system of simultaneous equations that defines the relationship between Okun's Law and the Phillips Curve.

Structural vector autoregressions

31. This method has its theoretical groundings in a synthesis of Keynesian and neoclassical models presented at the outset of this chapter. Blanchard and Quah (1989) associate supply shocks with permanent effects on trend GDP, while demand shocks are associated with temporary deviations from trend.

32. Vector autoregressions (VARs) are used to estimate the components of series. VARs, introduced by Sims (1980), have been described as atheoretical since they do not impose any theoretical restriction on the estimation process. However, Blanchard and Quah suggest a structure for VARs that depends on long-term restrictions in the variance-covariance matrix. These restrictions assume limits on the extent of shocks and their effects on each of the variables in the vector. For instance, the estimation presented in this paper assumes that shocks related to demand have only a short-term effect, so that the covariance between output and money errors is zero if they are further than six quarters away from each other.

33. DeSerres, Guay and St. Amant (1995) have estimated the permanent component of GDP for Mexico. This study explicitly identifies the effects of changes in the money supply and oil prices on potential output, and also finds that the variability of oil prices is an important source of changes in the long-run trend of potential output.

34. The DGS study assumes that real GDP growth (Δy), changes in the price of oil (Δo), and changes in the monetary base (Δm), are all stationary stochastic processes that respond to three types of contemporary orthogonal innovations: supply shocks (ε_s), oil price shocks (ε_o), and demand shocks (ε_d). The moving average representation of the model is:

$$(1) \qquad \Delta x_t = A_o\varepsilon_t + A_1\varepsilon_{t-1} + \ldots = \sum A_i\varepsilon_{t-i} = A(L)\varepsilon_t$$

where $\varepsilon_t = [\, \varepsilon_s \; \varepsilon_o \; \varepsilon_d]'$ and $\Delta x_t = [\Delta y_t \; \Delta o_t \; \Delta m_t]'$

---

[15] Assuming the existence of a group of economic variables that move together during a business cycle. This formulation has encouraged the use of techniques that extract common cyclical and permanent components (Stock and Watson, 1991 and 1993), and with asymmetric rates of growth (Hamilton, 1989), frequently used in the theory of leading economic indicators.

35. In order to estimate the structural model, first the reduced form of the VAR is estimated. The residuals depend on the innovations in equation (1) as follows:

$e_t = A_o\varepsilon_t$

which implies the following:

$\mathbf{E}(e_t e'_t) = A_o E(\varepsilon_t \varepsilon'_t) A_o'$

and permits setting the long-run restrictions that each of the innovations in the variance-covariance matrix must meet.

36. The main problem encountered when using the above methodology is the identification of those shocks, which because of their nature, have simultaneous effects on the short- and long-run structure of the model.

Production functions

37. In general, this methodology is based on a production function with two factors, capital and labor. Traditionally, production functions have relied on the Cobb-Douglas specification, even though other specifications, such as CES and TRANSLOG, can often provide richer results.[16]

38. In order to estimate potential GDP, total factor productivity is assumed to be decomposable into two parts: 1) trend growth that represents the deterministic (non-stochastic) growth of productivity; and 2) a stochastic component that describes the variations of output from trend.

39. In contrast to the other methodologies, production functions allow for an explicit identification of the determinants of potential output. However, the main disadvantages stem from the oversimplification of the production technology, and the statistical deficiencies that may exist in supporting estimates. In particular, reliable series on the stock of capital or the NAIRU for the Mexican economy do not exist. Therefore, this methodology will not be used in this chapter.

C. Estimates of Potential GDP and the Output Gap

Annual estimates

40. Annual data on real GDP for Mexico are available starting in 1900. However, because of the Revolutionary War, the series is missing almost a decade's worth of data. Thus, a usable sample starts in 1921. Furthermore, the System of National Accounts has kept a record of only a limited number of economic variables for an extended period of time. This has impeded the use of econometric techniques that rely on information about prices,

---

[16] In general, the production technology is assumed to have constant returns to scale, and the factor markets are assumed to be characterized by perfect competition.

demand, and production-related variables before 1980. This lack of data limits the techniques that can be used—in this chapter, only the HP filter is applied to the annual data.

41. Figures 1 and 2 show observed and potential GDP (log levels and percentage change) from 1921 to 2001.[17]

42. Three distinct growth episodes can be identified. Period 1, 1921–35, shows a low annual average growth rate for potential output of 0.7 percent. Period 2, 1936–81, represents a stage of relatively high growth rates, with potential GDP growth averaging 5.7 percent a year. Period 3, 1982–2000, including the debt-crisis of the early 1980s and the most recent economic and financial crisis of 1994–95, shows an average annual growth of potential GDP of only 2.8 percent.

43. Structural breaks in the production capacity of the economy were found at the beginning of periods 2 and 3 (1936–81 and 1982–2000). GDP log differences were run against an ARIMA process and dummy variables for those periods. An econometric specification was obtained that maximizes the likelihood function and yields independent and normal errors. The limitations of structural break tests applied to series such as the ones used in this paper are discussed in the concluding section.

Figure 1. Mexico: Observed and Potential GDP
(Log values of GDP in billions of 1993 pesos)

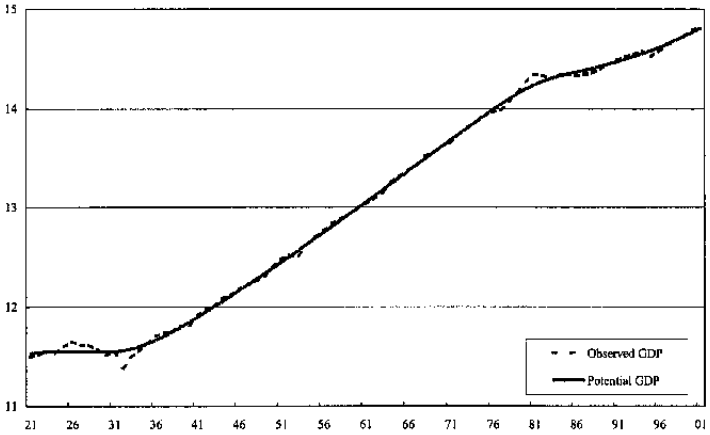


Figure 2. Mexico: Observed and Potential GDP
(Percentage change)

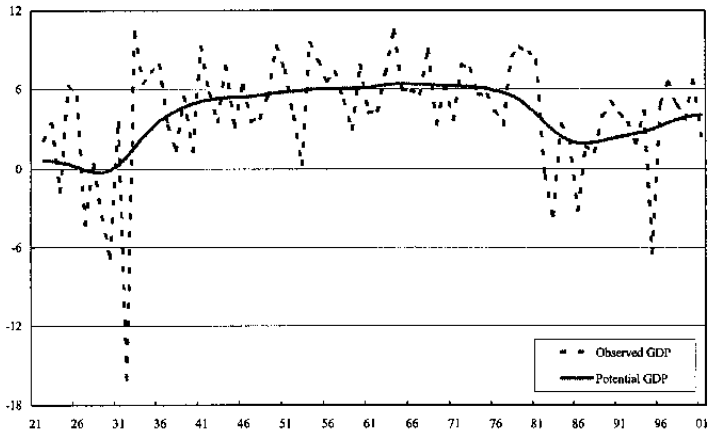
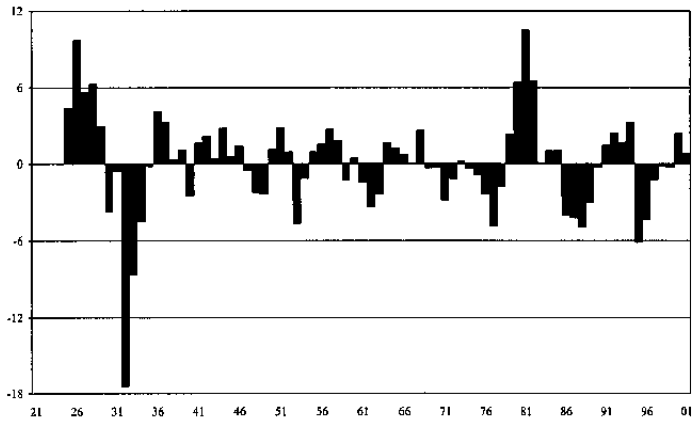


Figure 3. Mexico: Ouptut Gap
(In percent of potential output)

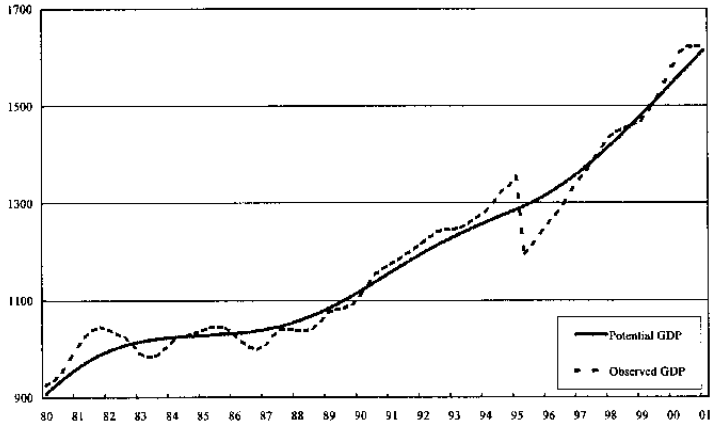


44. The output gap is shown in Figure 3. During 1936–81, actual GDP fluctuated around its potential within a range of +/- 4 percent, except in the early 1980s, when the gap averaged 8.5 percent. Such a large gap was not sustainable, and ultimately led

[17] The final year is projected.

to a reduction in potential GDP. This is an indication that excessively large or long-lasting gaps can ultimately derail economic stability.

Figure 4. Mexico: Observed and Potential GDP
(In billions of 1993 pesos)

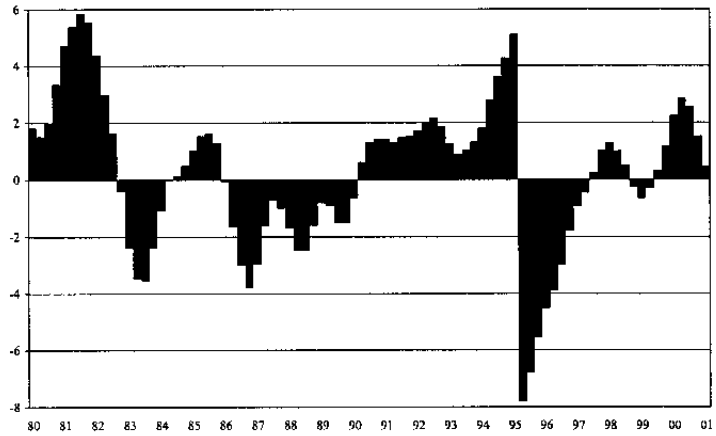


Quarterly estimates

45. The permanent component of Mexican GDP, obtained using the HP filter, and the implicit output gap, are shown in Figures 4 and 5.

46. The estimated annual growth rate of potential GDP, after extending the sample,[18] is 2.7 percent in the 1980–2000 period. Two episodes of continuous growth can be observed. The first one runs from 1980QI to 1982QII, with a positive output gap (actual output exceeding potential output) of 4.2 percent, on average. During this period, Mexico attained its highest level of investment in the last 20 years (26.7 percent of GDP) (Table 1). The external current account deficit averaged 4.7 percent of GDP over the same period. These data indicate the level of physical investment and financial resources that are required to sustain an output gap of that magnitude.

Figure 5. Mexico: Output Gap
(In percent of potential output)



[18] The sample was extended for three years on both ends to control for the end-point distortions that typically occur when using an HP filter. The series was extended backwards by interpolating the annual average growth rate of 1977–79 to the quarters corresponding to those years. The series was extended three years ahead by applying the average of GDP forecasts reported by consulting firms.

Table 1. Mexico: Potential GDP and Related Indicators, 1980–82				
Indicator	1980	1981	Q1-Q2 1982	Average
GDP growth	8.8	8.5	1.8	6.4
Potential GDP growth	5.6	5.0	3.5	4.7
Output gap	2.5	5.7	4.4	4.2
Inflation	29.8	28.7	49.5	36.0
Current account balance (in percent of GDP)	-5.0	-6.1	-2.9	-4.7
Investment (in percent of GDP)	26.5	28.5	25.0	26.7
Source: Mexican Secretariat of Finance and Public Credit.				

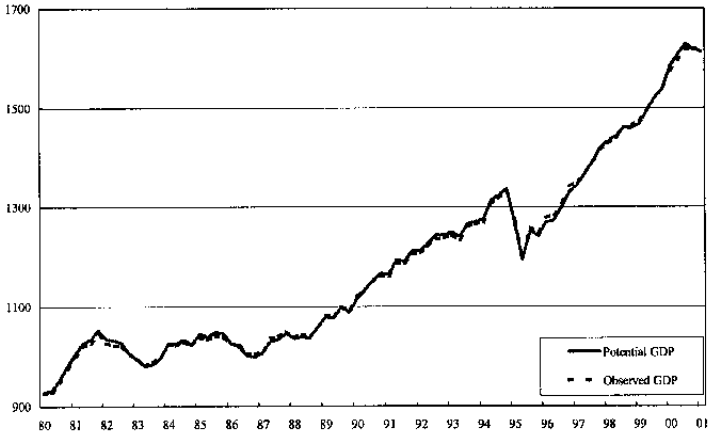
47. In the second period of continuous expansion, 1991QI–1994Q4, the average gap was 2.0 percent. Investment was kept at a relatively moderate level (21.1 percent of GDP). Nevertheless, foreign financing (opposite sign to the current account balance) reached a historical high of 7.0 percent of GDP for 1994 and averaged 6.0 percent of GDP for the four-year period. Related indicators are shown in Table 2.

Table 2. Mexico: Potential GDP and Related Indicators, 1991–94					
Indicator	1991	1992	1993	1994	Average
GDP growth	4.2	3.5	1.9	4.5	3.5
Potential GDP growth	3.4	3.1	2.3	2.6	2.8
Output gap	1.4	1.9	1.2	3.3	2.0
Inflation	18.8	11.9	8.0	7.1	11.5
Current account balance (in percent of GDP)	-4.6	-6.7	-5.8	-7.0	-6.0
Investment (in percent of (GDP)	19.8	21.6	21.0	22.2	21.1
Source: Mexican Secretariat of Finance and Public Credit.					

The Beveridge-Nelson Decomposition

48. Figure 6 shows the results of performing a BN decomposition on the GDP series. Since the BN methodology suffers from technical problems (as discussed above), the confidence level is minimal and, therefore, there are few meaningful implications for the design of economic policies. Indeed, note that the lines for observed and potential GDP in the figure below are almost indistinguishable, indicating the low capacity of the BN methodology to estimate the Mexican output gap.

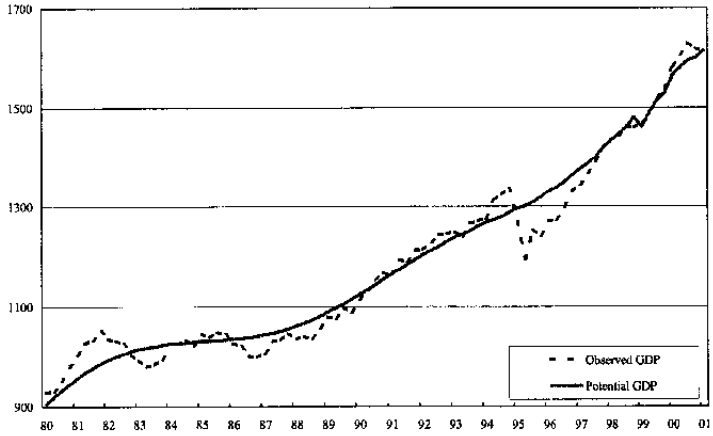
Figure 6. Mexico: Observed and Potential GDP
(In billions of 1993 pesos)



Structural VARs

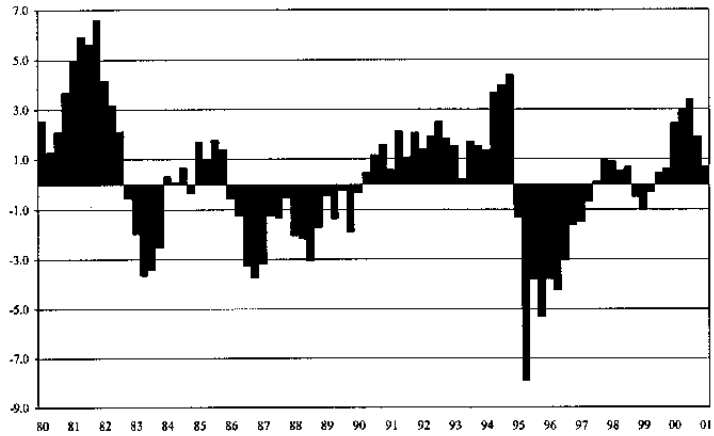
49. The permanent and cyclical components of GDP obtained by employing the structural VAR specification described by DeSerres, Guay, and St. Amant for Mexico are shown in Figures 7 and 8. In contrast to the DGS study that uses the index of industrial production as a proxy for GDP and the price of West Texas Intermediate oil, in this chapter, GDP and the price of the Mexican oil export mix are used.

Figure 7. Mexico: Observed and Potential GDP
(In billions of 1993 pesos)



50. The HP and DGS techniques show similar results when identifying the permanent and cyclical components. The magnitude of the output gap is very similar for the whole sample, especially during the two periods of expansion already mentioned, and for the contemporary period.

Figure 8. Mexico: Output Gap
(In percent of potential output)



51. The annual average growth of potential GDP during 1980QI–2000QI is 2.7 percent. The gap during 1980QI–1982QII was estimated to be 4.6 percent. During the second expansion period (1991QI–1994Q4), the average gap was 1.9 percent. Although the structural VAR and HP methodologies indicate

similar maxima for the gap, the estimated variance of the gap increases under the VAR specification compared with the HP filter.

D. Conclusion

52. The procedures outlined in this chapter were formulated during the last 20 years in order to meet the theoretical and empirical need for a better understanding of the determinants of long-run growth and fluctuations around its long-term trend. They also served to help design policy instruments that would minimize the effects of recessions and, in so doing, contribute to taking full advantage of the economy's growth potential.

53. The wide variety of procedures reviewed demonstrates the difficulty of identifying, with a reasonable degree of confidence, the permanent and cyclical components of the business cycle. Different techniques can point to the economy being at varied stages of the business cycle, despite being based on the same information set. This complicates the design of optimal policies.[19]

54. The specific characteristics of the Mexican economy also pose a challenge for the design of procedures to identify the time series components of GDP. The effects of the shocks experienced in the 1980s on the permanent and cyclical components have received little attention in the literature. Therefore, sufficiently powerful techniques to discern such effects on potential GDP have yet to be developed. Special attention should be focused on structural break tests for the potential output.[20]

55. The expansion periods indicated by the HP filter and those of the structural VAR preceded the most important crises experienced by Mexico in the last 20 years. During the expansion phase of 1980QI–1982QII, average annual GDP growth exceeded potential by 1.7 percentage points. During the subsequent expansion phase of 1991QI–1994QI, the difference was three-fourths of a percentage point. In both cases, these rates of growth fostered a positive output gap that ultimately contributed to destabilizing economic imbalances. With hindsight, this is not surprising since overheating involves an intensive use of resources, which often requires excessive external financing. This was not sustainable and ultimately was a factor leading to abrupt economic contractions. Thus, in those circumstances, the benefits for Mexico from high rates of growth proved to be largely illusionary.

---

[19] In an effort to reduce the number of relevant techniques to choose from in studying the components of a time series, King and Watson (1996) have proposed several estimators that show the robustness of the permanent and cyclical components through the moments obtained in the analysis of the series spectrum.

[20] Popular techniques for the identification of structural breaks cannot be used in this type of analysis. Given that the HP filter technique does not yield any error term, it is not possible to identify structural breaks nor to apply recursive residual analysis. In the case of the VAR specification, structural breaks are difficult to identify because the restrictions imposed would distort the meaningfulness of any statistical tests.

56. The following table presents estimates of the current output gap and some related indicators:

Table 3. Mexico: Potential GDP and Related Indicators, 1997–2001

Indicator	1997	1998	1999	2000	Q1 2001	Average 1/
GDP growth	6.8	4.9	3.8	6.9	1.9	5.6
Potential GDP growth	3.8	4.3	4.7	4.9	4.4	4.5
Output gap	0.7	1.6	0.0	2.0	0.6	1.0
Inflation	15.7	18.6	12.3	9.0	7.2	13.9
Current account balance (in percent of GDP)	-1.8	-3.8	-3.0	-3.1	-0.7	2.9
Investment (in percent of GDP)	21.5	22.6	22.7	23.2	23.4	22.5

Source: Mexican Secretariat of Finance and Public Credit.

1/ Not including 2001:Q1.

57. The results shown in Table 3, derived using an HP filter, indicate that potential GDP growth averaged 4.5 percent during 1997QI–2000Q4. Similarly, considering only the period 2000QI–2000Q4, potential GDP growth is estimated to be 4.9 percent.

58. Estimates derived from the structural VAR technique indicate potential GDP growth during 1997QI–2000Q4 to be 4.6 percent a year on average, and during 2000Q1–2000Q4 to be 5 percent a year. These results are similar to those obtained applying the HP filter.

59. The estimates of potential GDP growth presented in this chapter should be seen as indicative of the potential growth rate to which the Mexican economy can strive over the long run. They indicate at what pace the Mexican economy can grow without overheating, **for a given set of structural and other conditions (such as the quality of capital and labor, integration into global markets, as well as access to public services).** This paper has not examined the underlying factors affecting potential GDP growth in detail, leaving this to future research.

60. Following a period of substantial growth during 1936–81, with the debt crisis of 1982, the economy entered a phase of relatively slow growth during the 1980s. Partly reflecting the impending approval of NAFTA, as well as a number of ongoing structural changes in the economy, growth accelerated in the 1990s, until it was interrupted by the economic and financial crisis of 1994–95. The quick return to macroeconomic stability following the crisis and a deepening of earlier structural reforms has contributed to a recovery of economic activity and has placed the economy on the path to sustainable, strong output growth. To the extent that macroeconomic stability is maintained and structural conditions continue to improve, the potential rate of GDP growth can be raised, without causing overheating. This is the key challenge facing Mexican policymakers today.

List of References

Baxter, M., and R. G. King, 1995, "Measuring Business-Cycles: Approximate Band Pass Filters for Economic Time Series," *NBER Working Paper 5022*, National Bureau of Economic Research.

Beveridge, S., and C. R. Nelson, 1981, "A New Approach to Decomposition of Economic Time Series into Permanent and Transitory Components with Particular Attention to Measurement of the Business Cycle," *Journal of Monetary Economics*, Vol. 7, pp. 151–74.

Blanchard, O. J., and D. Quah, 1989, "The Dynamic Effect of Aggregate Demand and Aggregate Supply," *American Economic Review*, Vol. 79, pp. 655–73.

Bosworth, Barry, 1998, "Productivity Growth in Mexico," Background paper prepared for a World Bank project on Productivity Growth in Mexico, *Mexico: Enhancing Factor Productivity Growth, Report No. 17392-ME, Country Economic Memorandum*, August 31, 1998.

Burns, A. F., and W. A. Mitchell, 1946, *Measuring Business Cycles,* National Bureau of Economic Research.

Cogley, T., and J. Nason, 1995, "Effects of the Hodrick-Prescott Filter on Trend and Difference Stationary Time Series: Implications for Business-Cycle Research," *Journal of Economic Dynamics and Control*, 19, pp. 253–78.

DeSerres, A., A. Guay, and P. St-Amant, 1995, "Estimating and Projecting Potential Output using Structural VAR Methodology: The Case of the Mexican Economy," *Working Paper 95–2*, Bank of Canada.

Granger, C. W. J., 1966, "The Typical Spectral Shape of an Economic Variable," *Econometrica*, 37, pp. 424–511.

Guay, A., and Pierre St-Amant, 1996, "Do Mechanical Filters Provide a Good Approximation of Business-Cycles?," *Technical Report 78*, Bank of Canada.

Hamilton, J. D., 1989, "A New Approach to the Economic Analysis of Nonstationary Time Series and the Business Cycle," *Econometrica*, 57, pp. 357–84.

Hodrick, R. J., and E. C. Prescott, 1997, "Post-war U.S. Business-Cycles: An Empirical Investigation," *Journal of Money, Credit and Banking*, 29, pp. 1–16.

King, R. G., and M. Watson, 1996, "Money, Prices, Interest Rates and the Business-Cycle," *Review of Economics and Statistics,* 78, pp. 35–53.

Lucas, R E.,1994, "Review of Milton Friedman and Anna J. Schwartz's 'A Monetary History of the United States: 1876–1960," *Journal of Monetary Economics*, 34, pp. 5–16.

Nelson, C. R., and C. Plosser, 1982, "Trends and Random Walks in Macroeconomic Time Series," *Journal of Monetary Economics*, Vol. 10, pp. 139–67.

Prescott. E. C., 1986, "Theory Ahead of Business Cycle Measurement," *Quarterly Review*, Federal Reserve Bank of Minneapolis.

Quah, D., 1992, "The Relative Importance of Permanent and Transitory Components: Identification and Some Theoretical Bounds," *Econometrica*, 60, pp 107–118.

Rotemberg, J., 1999, "A Heuristic Method for Extracting Smooth Trends from Economic Time Series," *NBER Working Paper 7439*, National Bureau of Economic Research.

Rotemberg, J., and M. Woodford, 1996, "Real Business-Cycle Models and the Forecastable Movements in Output, Hours and Consumption," *American Economic Review*, Vol. 86, pp. 71–89.

Sims, C. A., 1980, "Macroeconomics and Reality," *Econometrica*, 48, pp. 1–48.

Stock, J. H., and M. W. Watson, 1991, "A Probability Model of the Coincident and Leading Indicators," in K. Lahiri, and G. H. Moore, eds., *Leading Economic Indicators: New Approaches and Forecasting Records*, pp. 63–85. NY: Cambridge University Press.

_____, 1993, "A Procedure for Predicting Recessions with Leading Indicators: Econometric Issues and Recent Experience," in J. H. Stock, and M. W. Watson, eds., *Business Cycles, Indicators and Forecasting*, pp. 95–156. Chicago: University of Chicago Press.

Watson, M. W., 1986, "Univariate Detrending Methods with Stochastic Trends," *Journal of Monetary Economics*, Vol. 18, pp. 49–75.

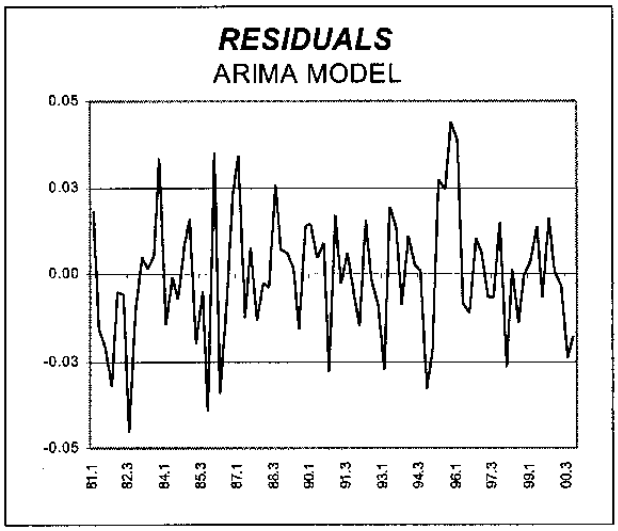
I. Beveridge-Nelson Decomposition
Analysis of GDP Series (logs)
Quarterly Data From 1980:1 to 2001:1
ARIMA Model: (0,1,2)x(0,1,1)

Summary statistics:

R Bar**2	0.984544
Standard error of dependent variable	0.151452
Standard error of estimate	0.018828
Sum of squared residuals	0.026589
Durbin-Watson statistic	1.886761
Q(20-2)	9.250304
Significance level of Q	0.953659

Variable	Coefficient	Standard error	T-stat	P-value
MA{2}	0.474252011	0.115268947	4.11431	0.00009858
SMA{4}	-0.528720375	0.112501110	-4.69969	0.00001157
DUM951	-0.023449331	0.012743882	-1.84005	0.06971787
DUM952	-0.060968999	0.013726677	-4.44164	0.00003028
DUM972	0.061573385	0.013962351	4.40996	0.00003401

Where DUMxxx are dummies for the year (first two digits) and quarter (last digit) indicated.
Analysis of the residuals:



The Ljung-Box Chi-Squared test for serial correlation
Test statistic: 13.0912 Significance level: 0.90540
The F-test for autoregressive conditional heteroskedasticity
Test statistic: 0.4035 Significance level: 0.98563
The Jarque-Bera normality test, ChiSqr(2)
Test statistic: 0.0202 Significance level: 0.98993

II. Structural VAR Estimation

Sample (adjusted): 1980:1 to 2001:1
Restrictions in Variance-Covariance Matrix of Innovations: 3
(Standard errors and T-statistics in parentheses)

	Y	O	M
Y(-1)	0.508628	-0.543105	0.241446
	(0.27461)	(0.42894)	(0.43821)
	(1.85219)	(-1.26615)	(0.55098)
Y(-2)	0.427595	1.039839	-0.330109
	(0.32260)	(0.50390)	(0.51479)
	(1.32546)	(2.06356)	(-0.64125)
Y(-3)	-0.687960	-0.890261	-0.857700
	(0.34170)	(0.53373)	(0.54526)
	(-2.01336)	(-1.66800)	(-1.57300)
Y(-4)	0.144980	-0.140424	0.359975
	(0.28811)	(0.45002)	(0.45975)
	(0.50322)	(-0.31204)	(0.78298)
O(-1)	0.225357	0.981250	0.222068
	(0.12749)	(0.19914)	(0.20344)
	(1.76762)	(4.92739)	(1.09154)
O(-2)	-0.155242	-0.134621	-0.032309
	(0.15801)	(0.24682)	(0.25215)
	(-0.98247)	(-0.54543)	(-0.12814)
O(-3)	0.186859	0.137281	0.186644
	(0.15768)	(0.24630)	(0.25162)
	(1.18506)	(0.55738)	(0.74178)
O(-4)	0.172263	-0.161425	-0.066811
	(0.13114)	(0.20485)	(0.20927)
	(-1.31355)	(-0.78803)	(-0.31925)
M(-1)	0.052770	0.120418	0.491866
	(0.14088)	(0.22006)	(0.22481)
	(0.37457)	(0.54722)	(2.18792)
M(-2)	0.066361	0.305920	0.333047
	(0.15397)	(0.24050)	(0.24569)
	(-0.43101)	-1.27203)	(1.35554)
M(-3)	0.059696	0.051663	0.106570
	(0.14970)	(0.23383)	(0.23888)
	(0.39878)	(0.22095)	(0.44612)
M(-4)	0.073389	0.265847	-0.195446
	(0.13265)	(0.20720)	(0.21167)
	(0.55326)	(1.28307)	(-0.92334)
C	0.007686	0.015758	0.011488
	(0.00355)	(0.00554)	(0.00566)
	(2.16666)	(2.84369)	(2.02928)
R-squared	0.708168	0.686236	0.697109
Adj. R-squared	0.653450	0.627405	0.640317
Sum sq. resides	0.032795	0.080016	0.083511
S.E. equation	0.022637	0.035359	0.036123
Log likelihood	189.5506	155.2111	153.5650
Akaike AIC	189.8883	155.5487	153.9026
Schwarz SC	190.2840	155.9444	154.2983
Mean dependent	0.024454	0.036964	0.031954
S.D. dependent	0.038453	0.057927	0.060231
Determinant residual covariance		5.03E-11	
Log likelihood		585.1801	
Akaike information criteria		586.1931	
Schwarz criteria		587.3802	

II. External Competitiveness and Current Account Sustainability[1]

A. Introduction

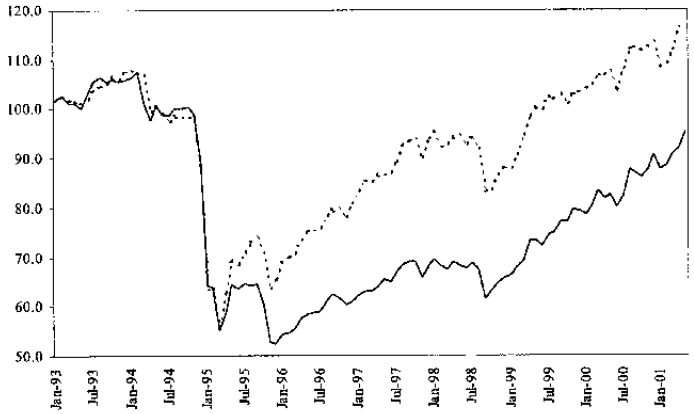
1. After years of robust growth, the deterioration in the U.S. economic outlook coupled with lower oil prices and the continued appreciation of the real exchange rate have focused attention on Mexico's external current account deficit and external competitiveness. This chapter analyzes Mexico's external competitiveness in the context of medium-term external current account sustainability. First, some indicators of external competitiveness are considered. Second, some exercises on current account sustainability are carried out using different methods and an equilibrium exchange rate based on a sustainable current account level is arrived at. Third, a set of indicators that have been found to have predictive power for financial crises are analyzed.

2. Although the real exchange rate has appreciated substantially in recent years and the non-oil current account has deteriorated, other indicators tend to mitigate these concerns. The current account sustainability analysis yields different results depending on the method used. According to the first method (stable external debt-to-GDP ratio), the current account projected over the medium term is sustainable and hence no exchange rate adjustment is required. According to the second method (stable net foreign liabilities-to-GDP ratio), a modest real effective exchange rate adjustment would be needed to reduce the current account deficit to a sustainable level. Finally, a third method (based on current account norms), suggests the need for a more substantial real effective exchange rate adjustment. However, this third criterion may have limited usefulness in estimating the sustainable current account deficit going forward, given that it does not take into account the profound structural changes that the Mexican economy has undergone in recent years.

B. Some Indicators of External Competitiveness

3. The most widely used indicator of external competitiveness is the real effective exchange rate (RER). Mexico's CPI-based RER has appreciated since 1995 and was 11 percent above its 1994 average as of March 2001. However, this measure does not consider productivity trends. Hence, an alternative measure, based on relative unit labor costs (ULC), is commonly used to complement the CPI-based measure (Figure 1). Although the ULC-based RER has appreciated less than the CPI-based measure, and is still some 7 percent below its 1994 average, it nevertheless displays a

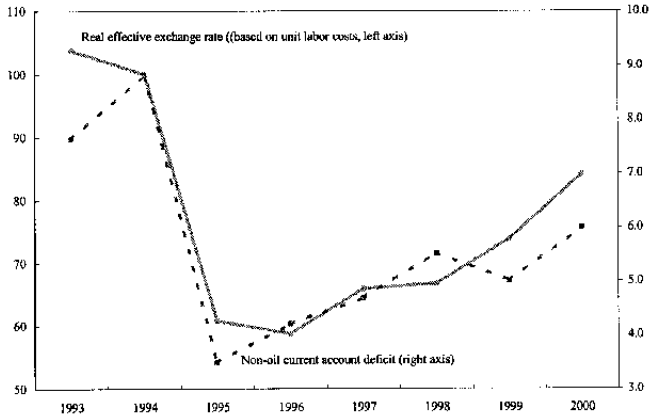
Figure 1. Mexico: Real Effective Exchange Rate (based on unit labor costs) — Real Effective Exchange Rate (based on consumer prices) --- 1994 = 100, + = appreciation



[1] This chapter was prepared by Laura Papi.

very similar trend to that of the CPI-based indicator. This raises some concerns, because the appreciating trend of the RER has been accompanied by a widening of the non-oil current account deficit and may thus suggest that the real appreciation is reducing the competitiveness of Mexico's traded goods sector (Figure 2). It should be noted that the real appreciation of the peso has partly resulted from an improvement in the terms of trade, in turn because of favorable oil price movements, and hence the overall current account deficit has not deteriorated by the same amount.

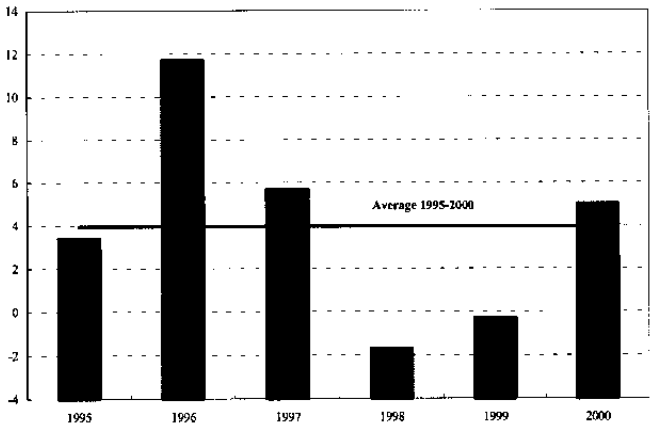
Figure 2. Mexico: External Non-oil Current Account Deficit and Real Effective Exchange Rate (In percent of GDP and 1994=100)



4. Some private sector analysts justify the strength of the peso in light of favorable developments in fundamentals. However, several analysts caution that the peso appreciation of the last few years may be excessive. Some private sector models that predict crisis probabilities have registered an increase in this probability for Mexico (which, however, remains low) partly because of the real exchange rate appreciation.

5. Nevertheless, there are some elements that ease the above-mentioned concerns. First, non-oil Mexican exports have gained market share in recent years. Figure 3 shows an average yearly increase in market share of 4 percent over the period 1995–2000. Moreover, this is with respect to all of Mexico's trading partners, and hence does not represent the effect of trade redirection that has taken place since the inception of NAFTA. Second, the seasonally adjusted (SA) non-oil trade deficit has been narrowing in recent months falling to US$2.0 billion in February–April compared with US$2.2 billion in the previous three-month period. The growth of trade (both exports and imports) has dropped markedly, starting from late-2000. The fall in non-oil exports has been more than offset by import weakness—in February–April 2001, non-oil exports fell by 1.7 percent a month (SA basis), compared with a decline of 1.8 percent a month for imports in February–April. Nevertheless, this could reflect the effect of the business cycle, given that, not only has the U.S. economy decelerated markedly, but so too has the Mexican economy, which follows the U.S. cycle very closely.

Figure 3. Mexico: Market Share of Non-oil Exports (Annual percentage change)



6. Finally, another factor that could assuage concerns relating to the RER is the fact that import and export elasticities with respect to the RER are low and are only a fraction of the

elasticities with respect to demand. Nevertheless, this can be a double-edged sword, as will become apparent in the next section.

C. Assessing Current Account Sustainability

7. One method often used to assess external competitiveness is to determine a sustainable level of the current account balance and then define the equilibrium RER as that exchange rate index that is consistent with the sustainable current account balance. Hence, the lower the export and import elasticities with respect to the real exchange rate, the larger the exchange rate adjustment required to achieve the sustainable level of the current account balance.

8. There are several ways to define a sustainable current account deficit. The most commonly used is the one that satisfies the criterion that the total-external-debt-to-GDP ratio should not increase.[2] The results of this sustainability analysis are reported in Table 1. The latter presents the minimum noninterest current account surplus required to maintain the external-debt-to-GDP ratio constant for different combinations of the real GDP growth rates and real interest rates on foreign debt.

Table 1. Current Account Sustainability: Constant External Debt to GDP
Minimum Noninterest Current Account Balance

(In percent of GDP, unless otherwise indicated)

	Growth 1/				
	1	2	3	4	5
Real Interest Rate (in percent)					
10	2.3	2.1	1.8	1.6	1.3
7	1.6	1.3	1.1	0.8	0.6
5	1.0	0.8	0.5	0.3	0.0
3	0.5	0.3	0.0	-0.3	-0.5

Source: Fund staff estimates.

9. However, given that oil exports are an important component of Mexico's current account receipts—oil exports accounted for 14 percent of total exports in 1995–2000—and oil prices are highly volatile, it would seem more appropriate to define a sustainable non-oil current account balance by subtracting from the values of Table 1, the average level of oil exports calculated over an extended period of time, say five years. This is done in Table 2, using average oil exports during 1995–2000 (2.6 percent of GDP).

---

[2] The standard formula used is CA*/GDP=(r-g) D/GDP, where the CA* denotes the noninterest current account balance that has to be financed via debt-creating flows, r the average real interest rate paid on external debt, g the real GDP growth rate and D the country's total external debt.

Table 2. Current Account Sustainability: Constant External Debt to GDP
Minimum Noninterest Current Account Balance

(In percent of GDP, unless otherwise indicated)

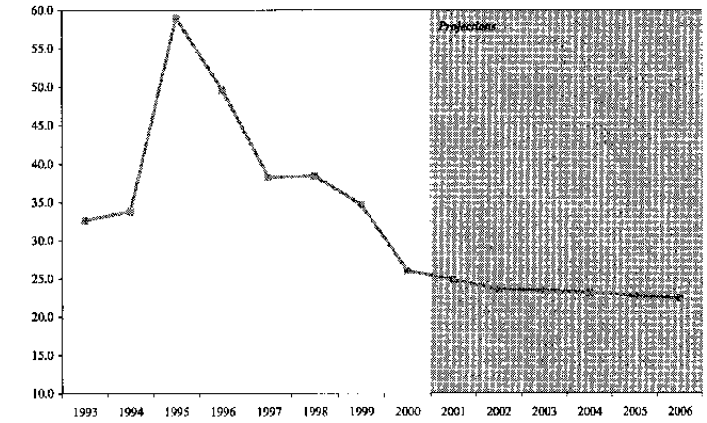
	Growth 1/				
	1	2	3	4	5
Real Interest Rate (in percent)					
10	-0.3	-0.6	-0.8	-1.1	-1.3
7	-1.0	-1.3	-1.6	-1.8	-2.1
5	-1.6	-1.9	-2.1	-2.4	-2.6
3	-2.1	-2.4	-2.6	-2.9	-3.2

Source: Fund staff estimates.

10. In order to calculate the current account balance to be compared to the tables above not only is it necessary to consider the noninterest component of the current account balance, but it is also necessary to subtract the part of the current account deficit which can be financed via nondebt creating flows, such as foreign direct investment or equity inflows or a draw down of assets abroad. Hence, the financing mix affects this measure of sustainability.

11. The medium-term projections contained in the accompanying staff report, assume that the average real interest rate on Mexico's external debt is relatively stable at about 5 percent—the same rate that Mexico paid in 2000—as the decline in Mexico's spreads is expected to be offset by a rise in international interest rates. Table 3 presents the growth assumptions underlying the medium-term projections as well as the "adjusted" current account balance (both overall and non-oil) over the forecasting horizon. These figures can then be compared either with those of Table 2 or Table 3. The projected current account balances are always higher than what would be indicated by the stable debt-to-GDP ratio criterion. Indeed, our medium-term projections forecast a modest decline in the external debt-to-GDP ratio to 22 percent in 2006 from 26 percent at end-2000 (Figure 4). This is also affected by the projection of FDI flows, expected to continue to be strong and amounting, on average, to some 60 percent of the current account deficit, as the Mexican economy becomes even more integrated with the U.S. economy.[3] In other words,

Figure 4. Mexico: Total External Debt
(In percent of GDP)



[3] The Citigroup's US$12.5 billion acquisition of Banamex, expected to be completed in the fourth quarter of 2001, is reflected in an increase in assets in 2001, but in subsequent years, these assets are assumed to be partially drawn down and hence would be a nondebt creating source of current account financing.

given our medium-term macroeconomic forecasts and using the criterion of a stable external-debt-to-GDP ratio, Mexico's current account deficit is sustainable. More importantly, in our projections Mexico's current account deficit allows for a reduction in the debt-to-GDP ratio, even when the domestic economy and its main trading partner, the United States, return to their respective potential output growth rates and close the output gap.

Table 3: Medium-Term Projections
(In percent of GDP, unless otherwise indicated)

	2000	2001	2002	2003	2004	2005	2006
Mexican GDP growth rate (in percent)	6.9	2.5	5.3	5.0	5.3	5.5	5.5
U.S. GDP growth rate (in percent)	5.0	1.5	2.5	3.7	3.5	3.2	3.2
Adjusted current account balance	3.0	1.3	0.3	0.7	0.9	0.8	0.8
Adjusted non-oil current account balance	0.3	-1.4	-2.3	-1.9	-1.7	-1.8	-1.9
Goods, non-factor services, and transfers balance	-0.6	-1.4	-2.0	-1.8	-1.6	-1.7	-1.6
Non-oil goods, non-factor services, and transfers balance	-3.4	-3.5	-3.9	-3.4	-3.1	-3.1	-2.9

Sources: National Institute of Statistics and Geography (INEGI); World Economic Outlook; and Fund staff projections.

12. A second approach used in the literature is one that defines the sustainable current account balance as that balance that maintains the ratio of net foreign liabilities (NFL) to GDP constant. The difference with the previous approach is that the way in which the current account is financed does not matter. This has been argued on the grounds that a country cannot continuously accumulate foreign liabilities, not just foreign debt.[4] Further, foreign assets are also taken into account. The first difficulty in these calculations is to determine the initial stock of Mexico's net foreign liabilities, given that Mexico does not yet produce statistics on the international investment position. The estimates of Lane and Milesi-Ferretti (LM-F 1999) for the end-1997 stock have been utilized and then updated using the cumulative current account deficits in the years 1998–2000. Given that LM-F had two different estimates (one based on cumulative current account balances and one on stocks of foreign assets and foreign liabilities), an average of the two is used.[5] Following this procedure, Mexico's stock of net foreign liabilities at end-2000 is estimated to have been 37.6 percent of GDP.

[4] The concept of foreign liabilities is broader than external debt. For example, it includes also the stock of foreign direct investment.

[5] The estimates of Lane and Milesi Ferretti were 40.6 percent of GDP and 43.2 percent of GDP at end-1997.

13. The results of this sustainability exercise are presented in Table 4, which shows the minimum balance on goods, nonfactor services, and transfers required to keep the net-foreign-liability-to-GDP ratio constant for various growth rates and net real rate on foreign liabilities.[6] Table 5 presents the same calculations for the non-oil balance.

Table 4. Current Account Sustainability: Constant Net Foreign Liabilities to GDP
Minimum Goods, Nonfactor Services, and Transfers Balance

(In percent of GDP, unless otherwise indicated)

	Growth 1/				
	1	2	3	4	5
Real Interest Rate (in percent)					
10	3.4	3.0	2.6	2.3	1.9
7	2.3	1.9	1.5	1.1	0.8
5	1.5	1.1	0.8	0.4	0.0
3	0.8	0.4	0.0	-0.4	-0.8
2	0.4	0.0	-0.4	-0.8	-1.1

Source: Fund staff estimates.

[6] The formula used in these calculations is: CA**/GDP= (r'-g) NFL/GDP, where CA** denotes the balance on goods, nonfactor services and transfers, r' the average net real rate on foreign liabilities (this would be the foreign interest rate for the part of foreign liabilities accounted for by external debt, and dividend payments on equity investments and such minus the rate earned on foreign assets).

Table 5: Current Account Sustainability: Constant Net foreign Liabilities to GDP Minimum Non-Oil Goods, Nonfactor Service and Transfer Balance

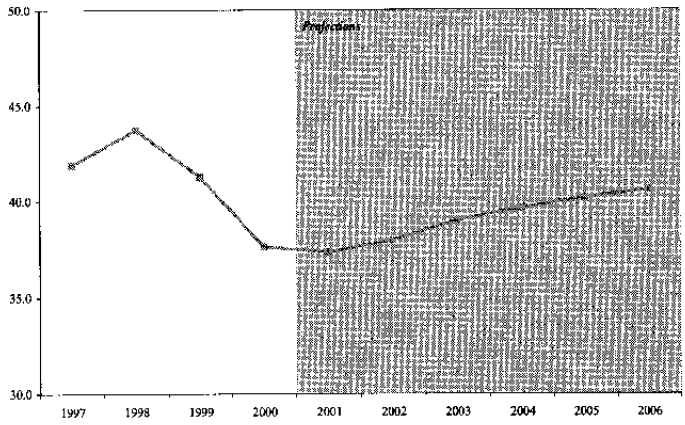
(In percent of GDP, unless otherwise indicated)

	Growth 1/				
	1	2	3	4	5
Real Interest Rate (in percent)					
10	0.7	0.4	0.0	-0.4	-0.8
7	-0.4	-0.8	-1.1	-1.5	-1.9
5	-1.1	-1.5	-1.9	-2.3	-2.6
3	-1.9	-2.3	-2.6	-3.0	-3.4
2	-2.3	-2.6	-3.0	-3.4	-3.8

Source: Fund staff estimates.

14. These figures can be compared with the projections for the goods, nonfactor services, and transfer balance reported in Table 3, considering that in the forecasting horizon the net real rate on foreign liabilities is about 3 percent. As can be deduced from this comparison, the projected balance is short of that necessary to maintain a constant NFL-to-GDP ratio. Indeed, Figure 5 shows a modestly rising trajectory for net foreign liabilities over the forecast horizon. Hence, according to this criterion the real exchange rate would appear somewhat overvalued.

Figure 5. Mexico: Net Foreign Liabilities
(In percent of GDP)



15. A third approach it to calculate current account norms, by estimating the long-run determinants of savings and investment. The Research Department of the Fund has applied this approach to several emerging market countries based on Chinn and Prasad (2000) using cross-section and panel data from 1980 to 1995. [7] From the estimations, the current account

[7] Chinn and Prasad (2000), "Medium-term Determinants of Current Accounts in Industrial and Developing Countries: An Empirical Exploration," NBER Working Paper 7581, March 2000 and IMF Working Paper WP/00/46.

balance is positively correlated with the government budget balance, the initial level of net foreign assets, and terms of trade volatility,[8] while negatively correlated with the degree of openness of the economy. The estimated current account deficit norm for Mexico is 1½ percent of GDP (see Isard, Faruqee, and Prasad, 2000) and hence significantly lower than our medium-term forecasts.[9]

16. Each of the methods discussed above has some limitations. The first and second criteria can be criticized on the grounds that although they provide conditions for either the debt-to-GDP ratio or the NFL-to-GDP ratio to stabilize, they are silent on the appropriateness of a specific level for these variables. The third criterion can be criticized on the basis that, for an economy that is undertaking important structural changes, the reliance on a long historical period to determine the sustainable current account deficit is affected by factors that are no longer relevant. In the case of Mexico, the numerous financial crises which have occurred in the sample period bias downward the sustainable current account deficit obtained using this method, by not adequately taking into account the improvements in the economy's fundamentals and financial strength of the past five years and the much greater access to international capital markets.

17. Given the limitations of the methods used to define the sustainable current account balance, the analysis above is complemented by a set of indicators that have been found to have predictive power in identifying unsustainable current account deficits, i.e., current account deficits that lead to financial crises and require abrupt and drastic changes in policies, as suggested by Milesi-Ferretti and Razin (1996).[10] A set of indicators of current account sustainability is presented in Table 6, including: the level of savings and investment, the fiscal balance, the openness of the economy, and the composition of external liabilities. The indicators shown in Table 6 paint a generally positive picture. The planned fiscal reform is expected to reduce considerably the fiscal deficit, allow for an increase in investment without putting pressure on the external accounts, and improve competitiveness. As already mentioned above, external debt is projected to decline over the medium term and the debt-service ratios to improve. Moreover, Mexico can finance over 60 percent of its current account deficit with FDI and short-term flows have become a very small part of the capital account since the introduction of the floating exchange rate regime. The proportion of all (including repayments on medium- and long-term debt) short-term debt is less than a third of total external debt and is almost entirely covered by official reserves.

---

[8] Terms of trade volatility is expected to increase savings, due to a higher degree of uncertainty.

[9] Isard, Faruqee, and Prasad (2000), "Proposed saving-investment norms for nonindustrial countries", IMF mimeo.

[10] Milesi-Ferretti and Razin (1996), "Current Account Sustainability," Princeton Studies in International Finance, No. 81, October.

Table 6: Indicators of Current Account Sustainability

	Average				
	1999	2000	2001	2002	2003–2006
Current account balance (in percent of GDP)	-2.9	-3.1	-3.5	-4.0	-3.5
National savings (in percent of GDP)	20.7	20.2	20.2	20.9	20.9
Investment (in percent of GDP)	23.6	23.3	23.6	24.9	24.4
Fiscal balance (in percent of GDP)	-7.1	-4.0	-3.9	-2.0	-1.4
Exports of goods and services (in percent of GDP)	20.4	20.6	18.9	18.9	20.6
GDP growth rate (in percent)	3.7	6.9	2.5	5.3	5.3
Real effective exchange rate, (average, 1994=100)	98.9	108.7	...	...	...
Interest payments (in percent of exports of goods and services)	13.3	11.8	9.6	8.4	8.1
External debt (in percent of exports of goods and services)	170.3	126.1	131.8	125.3	111.4
Short-term debt to total (residual maturity)	28.3	30.9	...	...	...
Gross reserves to short-term debt (residual maturity)	60.6	77.2	91.9	95.5	97.3
FDI (in percent of GDP)	2.5	2.3	4.1	2.4	2.4

Sources: Mexican authorities; and Fund staff estimates.

18. Other important qualitative indicators that Milesi-Ferretti and Razin find important are the health of the financial sector and the exchange rate policy. On this front, Mexico scores well as the health of the financial system has dramatically improved in recent years and the exchange rate regime is very close to a clean float. It could be argued that the fact that the exchange rate regime is flexible should affect the interpretation of RER developments, as the actual RER can be considered an equilibrium exchange rate and exchange rate adjustments are not delayed because of the authorities' defense of an unsustainable exchange rate level. Moreover, even if a substantial RER adjustment were to take place, say 20 percent, this is unlikely to cause a financial crisis, as experienced by Mexico up to 1995, given that the floating exchange rate has discouraged the build-up of significant balance sheet exposures to exchange rate risk. The events of 1998 corroborate this view.

19. Indeed, the type of balance sheet imbalances that typically develop in a fixed exchange rate regime are absent in Mexico at present. Commercial banks have a foreign exchange position, which is typically close to zero. The public sector has been reducing its external-debt-to-GDP ratio very aggressively—the end-2000 level was 15 percent compared to 41 percent at end-1995 and, moreover, the repayment schedule is smooth. The private corporate sector appears to have a short foreign exchange position, but its size, at about

US$15 billion for firms quoted on the stock exchange (about 15 percent of their annual foreign sales) appears manageable and concentrated in export firms.[12] Nevertheless, a substantial exchange rate adjustment may well have implications for the inflation target and other macroeconomic variables, thus requiring some policy adjustments.

D. Conclusion

20. The analysis conducted above produced mixed results regarding the appropriateness of Mexico's external competitiveness level. While real exchange rate measures show a substantial appreciation in recent years—with the RER back to the levels reached before 1994—and the non-oil current account balance has been deteriorating, Mexico's exports are gaining market share. An exercise aimed at calculating a sustainable level for the current account balance using different methods showed that according to one of the sustainability criteria (stable debt-to-GDP ratio), the real exchange rate is not overvalued, while the criterion of a stable net foreign liabilities-to-GDP ratio points to a modest overvaluation. The third criterion examined, based on current account norms, suggests that the extent of overvaluation is more substantial. However, this criterion may be of limited usefulness going forward, as it does not take into account the profound positive changes of the Mexican economy of the last five years. Finally, examining jointly a variety of indicators that have been found to have predictive power in financial crises, a generally positive picture emerges.

[12] However, as the private corporate sector has been the main intermediary of capital inflows in recent years, either on its own account or for the financing of PIDIREGAS projects, closer monitoring is warranted. It is possible that the sample used to gather information about the foreign exchange (FX) position of the corporate sector is not representative of the whole economy or that on-lending practices to smaller enterprises, which do not have access to international capital markets, are transferring the FX risk to firms that are less well equipped to bear it.

III. Alternative Measures of the Fiscal Deficit and Fiscal Sustainability[1]

A. Introduction

1. The Mexican authorities recently began to publish a more comprehensive definition of the overall fiscal balance. The latter definition goes beyond the traditional (budget) measure by including some quasi-fiscal operations that had been excluded previously from the narrower definition.[2] Such operations have been substantial in Mexico, being mainly tied to the carrying costs of government debt instruments issued during the banking sector crisis of the mid-1990s.

2. The broader measure of the fiscal balance yields a deficit that is some 3 percentage points of GDP higher than the official statistics. While the broader measure shows a higher deficit, it also shows that the fiscal consolidation that has taken place since the mid-1990s has been even larger than revealed by official statistics. In addition, the government has expressed its commitment to sound fiscal policy and presented to congress a tax reform package. The reform aims at reducing fiscal dependence on oil revenues by increasing tax revenues by 1.7 percentage points of GDP a year.[3] The latter would be complemented by administrative measures that the authorities estimate could yield an additional 1.5 percentage points of GDP over the next five years. The estimates presented in this chapter indicate that the authorities' plans, if approved unchanged, would lead to a substantial reduction in the debt/GDP ratio and would thus make an important contribution to fiscal sustainability, by reducing dependence on oil revenues, while allowing for a moderate increase in social spending.

3. This chapter presents different measures of the fiscal deficit in Mexico, including the traditional budget balance, the adjusted balance now being published by the authorities, and the augmented fiscal balance that has been used by Fund staff, and which is similar to the authorities' adjusted balance. While the more comprehensive definitions provide a better indication of the fiscal position to assess long-term sustainability, their high interest content makes it difficult to assess the impact of fiscal policy on aggregate demand. Therefore, it is necessary to complement the more comprehensive definitions with other measures of the fiscal position, such as the primary balance and the operational balance. Measures of the fiscal stance and fiscal impulse are also reviewed in this chapter.

---

[1] This chapter was prepared by Juan Pablo Córdoba.

[2] Information on the most important of these operations was published separately.

[3] The authorities estimate a net yield from the reform of 1.2 percentage point of GDP as the federal government has to transfer approximately 23.5 percent of tax revenues to the states. An additional 0.15 percentage point will be spent on programs to compensate the poor for the elimination of exemptions and the zero-rating on domestic sales of basic goods.

B. Alternative Measures of the Fiscal Balance

4. The first step in deciding on how to measure the fiscal balance is to define the appropriate coverage of the public sector. In Mexico, official statistics and Fund programs have included the operations of the federal government, nonfinancial public enterprises, and extra budgetary funds, but have excluded the operations of state and local governments and those of public financial entities. State and local governments have been excluded, largely because of long lags in the production of their fiscal statistics. This omission however, is not significant as sub-national governments have limited revenue and borrowing capacities and rely on revenue sharing and federal government transfers for their operations.[4] Public financial entities on the other hand, have traditionally engaged in large quasi-fiscal operations. Until recently, the information on the most important of these operations was reported separately—especially those associated with the banking crisis of the mid-1990s—but were not included in the official fiscal statistics.[5]

5. The **traditional fiscal** balance in Mexico is reported on a cash basis, but it deviates from the 1986 Government Finance Statistics (GFS) Manual in four main aspects: 1) revenues from privatization and unrealized capital gains on international reserves and debt buy-back operations are recorded as income; 2) the inflation component of indexed bonds is not included; 3) spending on some public investment projects is recorded when the financial obligations are serviced, not when the investment is made;[6] and, 4) the costs of quasi-fiscal operations are not included.[7]

6. The **adjusted fiscal balance now being published by the authorities in parallel to the budget measure** seeks to correct these shortcomings. The adjusted measure excludes the revenue from privatization and unrealized capital gains and includes the inflation component of indexed bonds. It also includes the net costs of the deferred investment projects

---

[4] States and municipalities collect less than 5 percent of total tax revenues.

[5] The budget incorporates transfers to the Bank Savings Protection Institute (IPAB)—that administers the bank restructuring and debtor-support programs—to cover a portion of the real interest cost of these liabilities. Fund documents report an adjusted deficit measure, which includes an estimate of these costs.

[6] This refers to investment projects that allow for deferred recording in the fiscal accounts (PIDIREGAS).

[7] There are four types of quasi-fiscal operations that have been identified: 1) those related to the bank restructuring operations which are the largest component; 2) those related to debtor-support programs; 3) the liabilities assumed by the government from the failure of toll-road concessions; and 4) net financial requirements of development banks. At end-2000, total liabilities from these sources amounted to 17 percent of GDP.

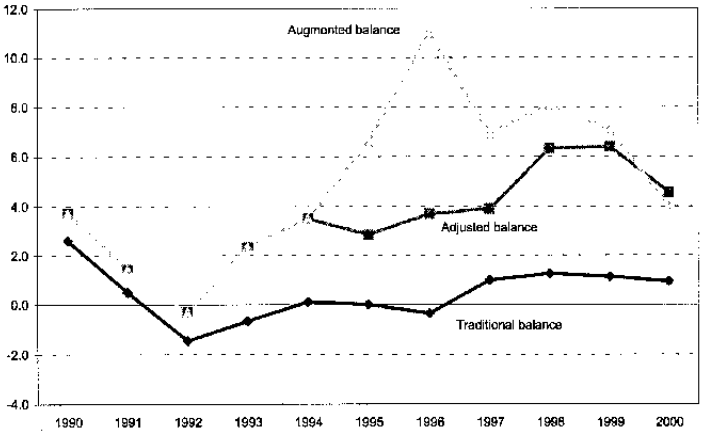
(PIDIREGAS), the costs of debtor-support programs (including toll-road concessions) and the financial requirements of IPAB and of development banks.[8]

7. The **augmented fiscal balance** used by the staff, incorporates the above adjustments and, in addition, it includes the nonrecurrent costs of the quasi-fiscal operations, namely the value of the debt issued for bank restructuring and debtor-support programs, net of asset recoveries. This measure better reflects the changes in the stock of domestic debt during the period.[9]

8. Given the relatively high interest burden (current and imputed) in Mexico (6 percent of GDP in 2000) and the relatively high rates of inflation seen recently, measures such as the **operational deficit,** which excludes the inflation component of domestic interest payments, and the **primary balance,** which measures the fiscal balance net of interest receipts and payments, are also needed to assess the fiscal stance. Finally, in the case of Mexico, it is important to look at the evolution of the **non-oil fiscal balance,** as public sector oil revenues make up over 25 percent of total revenues.

9. The different measures of the fiscal balance are presented in Table 1. The traditional fiscal deficit averaged 0.5 percent of GDP during the 1990s and has been close to 1 percent of GDP during the last four years. On the other hand, the adjusted balance averaged -3.5 percent of GDP during the last decade and over 5 percent of GDP over the last four years (Figure 1).[10] The traditional balance underestimates the magnitude of the fiscal deficit; thus, reliance on such

Figure 1. Mexico: Public Sector Borrowing Requirements Under Alternative Definitions
(In percent of GDP)



[8] The adjusted balance presented in this chapter does not coincide with that published by the authorities because the latter includes cash reserves made by the public pension fund (IMSS) in charge of administering the old pay-as-you-go system and the public institution (FOVISSTE) in charge of financing housing for public employees. Also, before 2000, there are differences in the estimation of the imputed cost of bank-restructuring and debtor-support operations. Discussions are underway with the authorities to reconcile the historical series and to agree on the appropriate treatment of these reserves.

[9] The authorities' adjusted balance includes asset recoveries since 2000, but it does not include the capital costs of bank restructuring and debtor-support programs before that.

[10] The augmented balance averaged almost 5 percent of GDP during the 1990s and close to 7.5 percent of GDP since 1996, although it declined from 7 percent of GDP in 1999 to 4 percent in 2000.

a measure does not provide a clear indication of the need for further fiscal adjustment to improve the sustainability of public sector debt in Mexico over the medium term.

Table 1. Mexico: Alternative Measures of the Fiscal Deficit, 1990–2000
(In percent of GDP)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Traditional budget measures 1/											
Overall balance	-2.6	-0.5	1.5	0.7	-0.1	0.0	0.3	-1.0	-1.2	-1.1	-0.9
Overall primary balance 2/	7.2	4.1	5.4	3.5	2.1	4.6	4.7	3.1	1.7	2.4	2.8
Non-oil balance 3/	-6.6	-3.6	-1.5	-2.2	-2.3	-4.2	-4.2	-4.8	-3.5	-3.5	-5.0
Non-oil primary balance	2.5	0.7	2.2	0.4	-0.5	-0.1	-0.4	-1.1	-1.0	-0.2	-1.6
Non-oil operational balance	n.a.	-1.4	0.9	-1.1	-1.6	0.0	0.3	-0.7	0.3	1.1	-2.6
Adjusted measures 4/											
Adjusted overall balance	-3.7	-1.4	0.3	-2.3	-3.5	-2.8	-3.7	-3.9	-6.3	-6.4	-4.6
Adjusted primary balance 5/	7.1	4.0	5.3	3.1	1.9	3.6	3.5	2.2	0.4	1.0	1.5
Adjusted non-oil overall balance	-7.7	-4.5	-2.6	-5.2	-5.7	-7.0	-8.3	-7.7	-8.6	-8.7	-8.6
Adjusted non-oil primary balance	2.4	0.6	2.0	0.0	-0.7	-1.1	-1.6	-2.0	-2.2	-1.6	-2.9
Adjusted non-oil operational balance	n.a.	-2.4	0.9	4.1	-5.0	-2.8	-3.7	-3.6	-4.8	-4.1	-6.2
Augmented balance 6/											
Augmented overall balance	-3.7	-1.4	0.3	-2.3	-3.5	-6.6	-11.0	-6.9	-8.1	-7.1	-4.0
Augmented non-oil overall balance	-7.7	-4.5	-2.6	-5.2	-5.7	-10.7	-15.6	-10.7	-10.4	-9.4	-8.1
Augmented non-oil operational balance	n.a.	-2.4	-0.3	-4.1	-5.0	-6.5	-11.0	-6.7	-6.6	-4.8	-5.6

Sources: Secretariat of Finance and Public Credit; and Fund staff estimates.

1/ Authorities' definition. Includes federal government and public enterprises.
2/ Treats transfers to IPAB as interest expenditure.
3/ Excludes oil balance: total public sector oil revenue minus PEMEX expenditure.
4/ Adjusted to exclude privatization revenue, unrealized valuation gains and including net costs of PIDIREGAS. Includes inflation adjustment to indexed bonds, imputed interest on bank- restructuring and debtor-support programs and financial requirements of development banks.
5/ Treats transfers to IPAB and financial requirements of development banks as interest expenditure.
6/ Augmented to include the net nonrecurrent capital costs of bank-restructuring and debtor-support programs.

10. Given that the interest component of the adjusted measure is large and inflation was quite high during 1995–98, the path of the adjusted balance is influenced by developments in the actual and imputed interest bill. The adjusted primary surplus deteriorated from 3.5 percent of GDP in 1996 to 0.4 percent of GDP in 1998, in large part, due to increased use of PIDIREGAS projects. Since then, it has recovered to 1.5 percent of GDP, but it still remains substantially below the 1990–95 average (4.2 percent of GDP). Furthermore, the adjusted non-oil primary balance moved from a modest surplus in the early 1990s to a deficit of almost 3 percent of GDP in 2000. This trend reflects the fact that recent declines in the adjusted deficit are largely due to the decline in interest costs—following the reduction in inflation and in nominal interest rates—but that the underlying fiscal position needs to be strengthened further. The recent trend also highlights Mexico's continued dependence on oil export revenues and underscores the need for undertaking a tax reform, as the authorities have proposed.

C. Fiscal Impulse in the 1990s

11. One way to assess the initial impact of fiscal policy on aggregate demand is to estimate the fiscal stance and impulse (Table 2). The fiscal stance is defined as the difference between the cyclically neutral balance and the actual fiscal balance, and thus provides an estimate of the initial amount of expansionary or contractionary pressure placed by the budget on aggregate demand (Schinasi, et al. (1991)). To estimate the cyclically neutral balance, we assume a unitary elasticity of government revenues with respect to **actual GDP** and that government expenditures grow with **potential GDP**.[11] The fiscal impulse is measured as the yearly change in the fiscal stance and captures the effect on the budget of changes in fiscal policy with respect to the cyclically neutral position.

Table 2. Mexico: Summary Impulse Measures
(In percent of GDP)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Traditional methodology 1/										
Total impulse	**-3.2**	**-2.3**	**0.2**	**0.6**	**-0.7**	**0.5**	**0.8**	**-1.0**	**0.0**	**0.9**
Revenue	1.4	-1.2	0.4	0.1	1.8	0.4	-0.9	1.0	-0.2	-0.5
Expenditure	-4.6	-1.1	-0.2	0.5	-2.5	0.1	1.7	-2.0	0.3	1.4
Primary impulse 2/	**1.0**	**-1.1**	**1.3**	**1.1**	**-2.6**	**0.7**	**1.0**	**0.2**	**-0.6**	**0.7**
Revenue	1.4	-1.2	0.4	0.1	1.8	0.4	-0.9	1.0	-0.2	-0.5
Expenditure	-0.5	0.1	0.9	1.0	-4.5	0.2	1.9	-0.8	-0.4	1.1
Adjusted methodology 3/										
Total impulse	**-3.2**	**-2.3**	**0.2**	**0.6**	**2.0**	**1.2**	**0.6**	**0.9**	**0.1**	**-0.9**
Revenue	1.4	-1.2	0.4	0.1	1.8	0.4	-0.9	1.0	-0.2	-0.5
Expenditure	-4.6	-1.1	-0.2	0.6	0.2	0.8	1.4	-0.1	-0.3	-0.4
Primary impulse 2/	**1.0**	**-1.1**	**1.3**	**1.1**	**-2.6**	**0.7**	**1.1**	**0.9**	**-0.5**	**0.7**
Revenue	1.4	-1.2	0.4	0.1	1.8	0.4	-0.9	1.0	-0.2	-0.5
Expenditure	-0.5	0.1	0.9	1.0	-4.5	0.3	2.0	-0.1	-0.3	1.1

Source: Fund staff estimates.
1/ Excludes privatization revenue BOM profits, unrealized capital gains on debt buy-back operations, and oil-export revenue.
2/ Treats transfers to IPAB as interest expenditure.
3/ In addition to revenue adjustments as in footnote 1, expenditures include the inflation component of indexed bonds, imputed interest on bank-restructuring and debtor-support liabilities, and the net cost of PIDIREGAS. It does not include the financial requirements of development banks nor the nonrecurrent costs from banking sector restructuring operations.

12. To better gauge the effect of fiscal policies on the budget, revenues coming from oil exports are excluded, since these resources do not affect domestic absorption, nor do changes in these revenues typically reflect changes in government policies. The assessment of the fiscal stance in the second half of the 1990s is quite different depending on the definition of

[11] The estimates take 1993 as the base year and assume that potential GDP grows at an annual rate of 4.2 percent in real terms. See Chapter 1 for estimates of potential GDP for Mexico.

the fiscal balance used.[12] For example, while the traditional definition yields a negative impulse of 0.7 percentage point of GDP in 1995, the adjusted measure provides a positive impulse of 2 percentage points of GDP, reflecting in large part the costs of the banking crisis and the effect of higher inflation on indexed bonds. In 2000, the traditional definition yields a positive impulse while the adjusted measure results in a negative one. In this latter case the difference is attributed mainly to the effect of lower interest rates (from 21 percent in 1999 to 15 percent 2000) on the cost of the bank-restructuring and debtor-support liabilities.

13. In order to have a more direct measure of discretionary fiscal policy, the primary impulse (excluding interest expenditures) is examined.[13] The primary impulse does not follow the same path as the total impulse. In 1995, while the adjusted total impulse was 2 percent of GDP, the adjusted primary impulse was negative 2.6 percent of GDP. On the other hand, the path followed by the primary impulse under the traditional and adjusted methodologies is very similar, providing a more consistent description of the role played by fiscal policy during the period.[14] With the exception of 1999, fiscal policy provided a positive impulse every year since 1996.

14. As with the adjusted fiscal deficit, the adjusted total impulse is influenced by the large nominal interest component and thus the adjusted primary impulse provides a better indicator of the fiscal stimulus, since the private sector is unlikely to consider the inflation component of domestic interest payments as a transfer from the public sector. On the other hand, by excluding all the costs of the bank-restructuring and debtor-support operations, the adjusted primary impulse is likely to underestimate the stimulus provided by the public sector to the extent that some of these operations contain a transfer component which is likely to be treated as an increase in net worth by the beneficiaries of these programs.[15]

---

[12] In both measures of the fiscal impulse, the definition of revenues is adjusted to exclude privatization revenue as well as unrealized capital gains (from central bank profits and debt buy-back operations). The difference between the two definitions is due to the inclusion in the adjusted measure of the inflation component of indexed bonds, the imputed interest on bank-restructuring and debtor-support liabilities, and the net cost of PIDIREGAS projects. See Appendix Table for a detailed presentation of the adjustments made to estimate the fiscal impulse.

[13] The imputed carrying costs of bank-restructuring and debtor-support programs are treated as interest expenditure.

[14] In 1998, the traditional and adjusted primary impulse measures differ mainly due to the PIDIREGAS projects whose net cost increases to 0.9 percentage point of GDP (from 0.2 percentage point in 1997). This change is not captured by the traditional primary impulse. Therefore, while the budget was showing a relatively small positive impulse in 1998, fiscal policy provided a larger stimulus incorporating the effect of PIDIREGAS projects.

[15] However, it is very difficult to estimate the grant component of these programs or its likely effect on consumer behavior. Similarly, the operations of development banks may also affect aggregate demand, but these are not captured in the measures presented above.

D. Public Debt and Fiscal Sustainability

15. The adjustments to the traditional balance also imply adjustments to the coverage of the public sector debt. Traditionally in Mexico, public sector debt refers to financial obligations of the federal government, but excludes the liabilities arising from the bank restructuring and debtor-support programs (including toll-road concessions) and those associated with the PIDIREGAS projects. The augmented public sector debt includes these liabilities (Table 3).

Table 3. Mexico: Total Public Sector Debt
(In percent of GDP)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Public Sector Gross Debt	**41.7**	**43.1**	**33.6**	**30.9**	**35.8**	**54.0**	**54.4**	**50.9**	**54.9**	**50.9**	**46.2**
Federal government	41.7	43.1	33.6	30.9	34.1	45.1	37.9	31.3	32.4	30.8	27.7
Domestic	12.1	17.7	12.7	11.4	13.8	9.4	8.4	9.3	10.4	11.6	13.0
Federal government	11.0	16.8	11.9	10.7	12.6	8.5	7.6	8.6	9.8	11.0	12.4
Public enterprises	1.0	0.9	0.9	0.7	1.2	0.9	0.8	0.7	0.6	0.6	0.5
External	29.6	25.4	20.8	19.5	20.3	35.7	29.6	22.0	21.9	19.2	14.7
Federal government	23.0	20.9	16.1	14.6	14.4	27.5	22.8	17.1	16.7	14.7	10.9
Public enterprises	3.7	2.7	2.6	2.4	2.9	4.1	3.9	2.6	3.1	2.9	2.3
Development banks	3.0	1.8	2.1	2.6	3.1	4.0	2.9	2.3	2.2	1.7	1.5
Bank restructuring and debtor support	0.0	0.0	0.0	0.0	1.7	8.9	16.4	19.3	21.4	17.7	15.8
PIDIREGAS liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.1	2.4	2.8

Sources: Secretariat of Finance and Public Credit; and Fund staff estimates.

16. At end-2000, gross (augmented) public debt was equivalent to 47.5 percent of GDP, and, while low by OECD standards, it is relatively high when compared with that of the larger countries in Latin America.[16] Slightly more than one-third of the total adjusted debt is denominated in foreign currency (including liabilities associated with PIDIREGAS projects); another third is domestic debt issued under bank-restructuring and debtor-support programs, and the remainder is domestic market-issued debt (see Table 3). The federal government's external debt/GDP ratio declined from 36 percent in 1995 to 15 percent in 2000. To a large extent, this decline has been due to an explicit effort by the authorities to substitute domestic obligations for external ones, but also, it has been the by-product of strong economic performance and of the currency appreciation in recent years.[17][18]

[16] This is equivalent to a net (augmented) debt/GDP of 41.7 percent of GDP as of end-2000. The authorities report net (augmented) debt/GDP at 40.2 percent; the difference is due to the authorities' use of fourth quarter (annualized) GDP to deflate the series as opposed to the average annual GDP used by the staff.

[17] While external debt has declined, domestic market-issued debt has increased since 1995 (from 9 to 13 percent of GDP). Although this move reduces the dependence on external financing and reduces the exchange rate risk of government debt, the strategy is not without risks, given the reduced domestic market for fixed-rate, medium- and long-term securities. In 2000, the authorities began issuing longer term fixed-rate instruments and they announced

(continued)

17. Given that the budget did not incorporate the issuance of bonds for bank restructuring and other debtor-support programs, the impact of the debt issued for this purpose was not fully incorporated into the traditional fiscal accounts. In addition, since a large portion of the initial bank-restructuring debt was issued in the form of zero-coupon bonds, the servicing of this debt has not placed pressure on the cash operations of the government. Nonetheless, the interest accruing on this debt (as recorded in the adjusted deficit measure) increases the stock of the debt and will eventually need to be financed explicitly. Recently, the authorities have made efforts to improve the profile of IPAB debt via liability management operations and, in 2000, began to issue market instruments—carrying market interest rates and coupons. Also, the authorities have announced that they intend to pay down the real interest accruing on this stock of debt, such that the stock will gradually decline as a share of GDP.

18. A standard debt-sustainability exercise indicates that under current policies (i.e., an adjusted primary surplus of around 1.5 percent of GDP) and with real interest rates on public debt of 6 percent (the average real interest rate on domestic debt instruments was 6.8 percent in 2000) a stable debt/GDP ratio would be obtained with annual GDP growth of 4 percent.[18]

Table 4. Mexico: Fiscal Balance and Debt/GDP Ratio, 2006, Sensitivity to GDP Growth and Real Interest Rates
(In percent of GDP, unless otherwise indicated)

	Average Real Interest Rate (in percent)					
	4	5	6	7	8	9
		Debt/GDP				
Average Annual Real GDP Growth Rates (in percent)						
Baseline scenario	35.8	38.2	40.7	43.4	46.2	49.1
2	42.7	45.6	58.5	51.7	54.9	58.4
4	38.4	40.9	43.6	46.5	49.4	52.5
6	34.5	36.8	39.3	41.8	44.5	47.4
		Adjusted balance				
Baseline scenario	-0.9	-1.4	-2.0	-2.6	-3.2	-4.0
2	-1.4	-2.0	-2.6	-3.3	-4.1	-4.9
4	-1.1	-1.6	-2.2	-2.9	-3.6	-4.3
6	-0.9	-1.3	-1.9	-2.5	3.1	-3.8

Source: Fund staff estimates.

---

the issuance of a 10-year fixed rate bond in mid-2001 (see Appendix Box 2 in accompanying Staff Report).

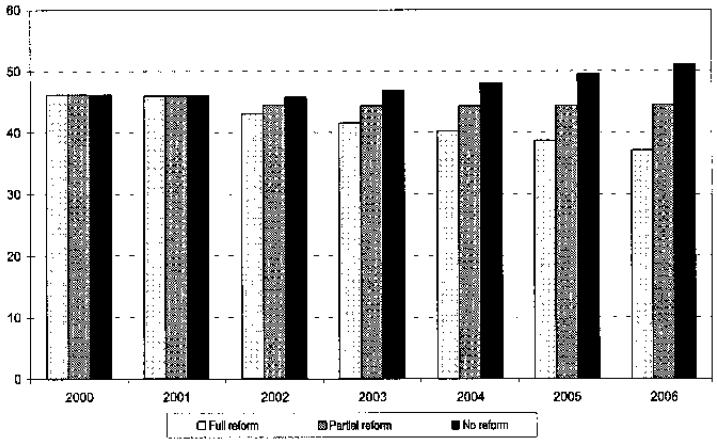
[18] Of the 21 percentage points of GDP decline in the external debt/GDP ratio between 1995 and 2000, 7 percentage points may be directly attributed to the real appreciation of the peso. That is, assuming a constant real exchange rate from end-1995, the debt/GDP ratio would have declined to 21.6 percent of GDP.

[19] The methodology follows Spaveta (1986).

Table 4 provides a summary grid of the debt/GDP ratio and fiscal balance resulting from current policies, but under different combinations of assumptions on growth and average real interest rates on public debt. With average real interest rates of 4-6 percent, the gross debt/GDP ratio would decline to 34-44 percent, if growth were above 4 percent per annum. With lower growth assumptions and/or higher real interest rates, the current adjusted primary balance would be insufficient to stabilize the debt/GDP ratio.

19. Only under sustained strong growth and relatively low real interest rate conditions, would the current levels of the adjusted primary balance be sufficient to produce important reductions in the debt/GDP ratio, over the medium term. In addition, if one takes account of the relatively high fiscal dependence on oil revenues,[19] the current level of the adjusted primary balance seems insufficient to ensure a continued reduction in the debt/GDP ratio. Therefore, an overarching objective of fiscal policy in Mexico in the near-term should be to improve the adjusted primary balance while reducing the dependence on oil revenues.

Figure 2. Mexico: Gross (Augmented) Debt Under Alternative Reform Scenarios
(In percent of GDP)



20. Approval of the tax reform proposal—as initially presented by the authorities—would achieve this objective, provided that all the revenue gains materialize and if most of these proceeds are saved.[20] The authorities estimate that the reform could have a net yield of 1.2 percent of GDP and that, in addition, through administrative measures, the authorities could collect an additional 0.3 percentage point a year over the next five years. Under these circumstances, the increase in the primary balance would lead to a much faster decline in the debt/GDP ratio than presented in Table 4, for any combination of interest and growth rates. If, on the other hand, the tax reform is not passed, the fiscal deficit could remain above 4 percent of GDP

[20] With an average oil price in 2000 of US$24.5 per barrel, oil revenues were 6 percent of GDP. Every US$1 change in oil prices represents roughly 0.1 percentage point of GDP in oil export revenue.

[21] The main elements of the reform are: (1) elimination of most VAT exemptions and zero-rating on domestic sales—including for books, magazines, processed and unprocessed foods, equipment for agriculture and fishing, and land transportation; (2) limit the application of a reduced 10-percent VAT rate in border regions; (3) elimination of special income tax regimes for different sectors and regions; (4) reduction of the top marginal personal income tax rate from 40 to 32 percent; (5) elimination of the 5 percent withholding of distributed profits; and (6) unification of the corporate income tax rate with the top marginal rate for individuals.

through 2006 while the gross (augmented) debt/GDP ratio could reach 50 percent by the end of the period (Figure 2 and Appendix Figure).[1 2]

E. Conclusion

21. The traditional budget balance used in Mexico underestimated the magnitude of the fiscal deficit during the last decade. The recent publication by the authorities of a more comprehensive measure of the fiscal balance is welcome and represents a major improvement in fiscal transparency. The adjusted fiscal balance shows that there has been an important improvement in the fiscal position since the mid-1990s, but that further improvement is still needed to reduce the debt/GDP ratio over the medium term. In particular, improving the non-oil primary fiscal balance, as intended by the authorities through the proposed tax reform, could lead to a considerable fiscal consolidation, while helping to reduce fiscal vulnerability to oil price volatility.

---

[22] Three simulations were conducted: the baseline scenario that uses the assumptions in the medium-term macroeconomic framework; a middle scenario, where only a partial version of the tax reform is passed (net yield of the reform is 0.6 percent of GDP and administrative measures only yield 0.1 percentage point of GDP a year) and this leads to slightly lower growth and higher interest rates; and a no-reform scenario where real interest rates would revert to 7 percent and GDP growth would remain around 4 percent a year.

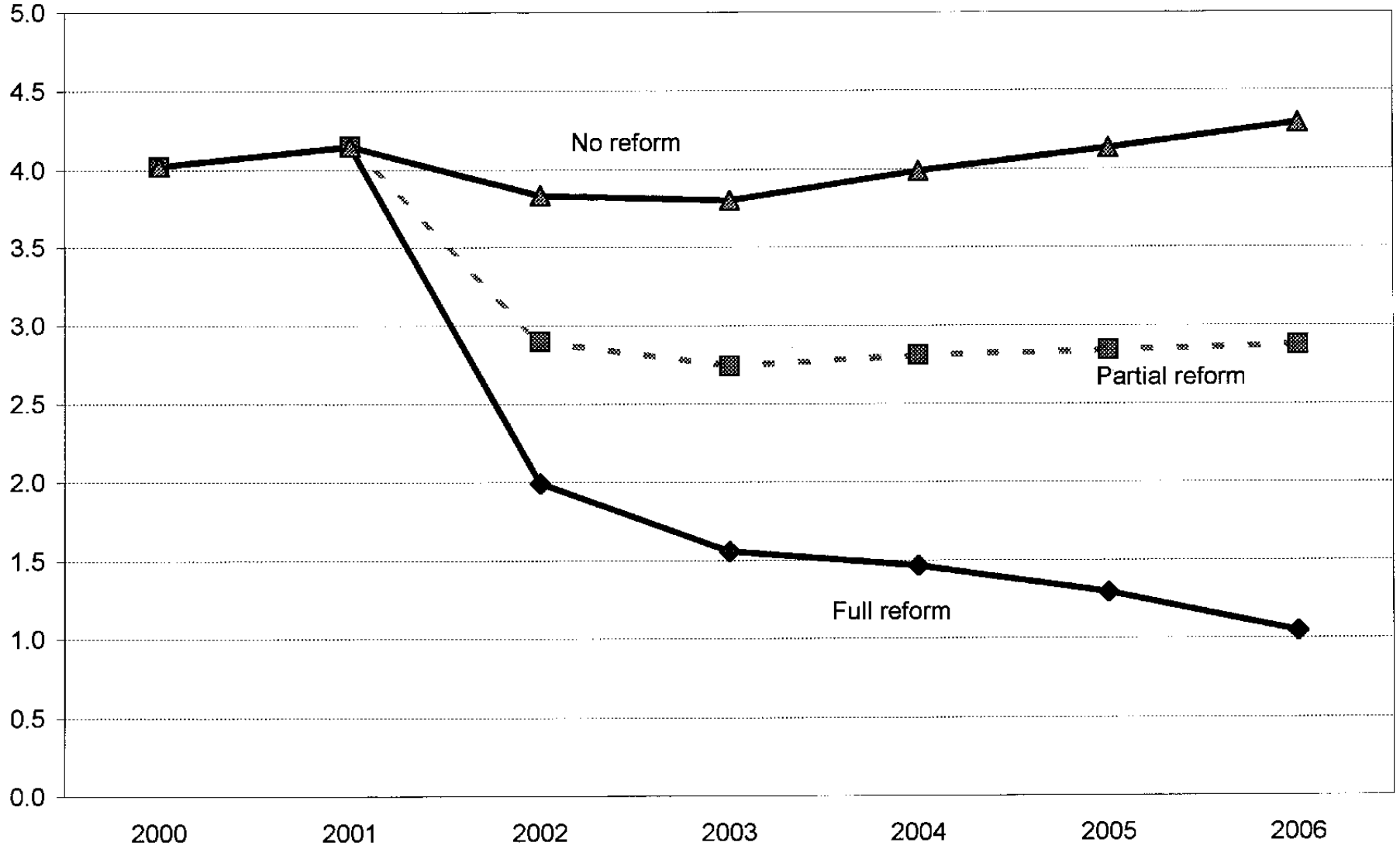
[23] The simulations presented in this chapter do not consider the possible negative effects of increases in government outlays due to the pension reform or to other contingent liabilities (for example, from conditional PIDIREGAS). According to the 1997 reform, the government guarantees that transition workers will receive a private pension at least as high as the one they would have received from the pay-as-you-go system, which could lead to considerable expenditure pressures.

List of References

Schinasi, Gary J., and Mark S. Lutz, 1991, "Fiscal Impulse," IMF Working Paper 91/91 (Washington: International Monetary Fund).

Spaveta, Luigi, 1986, "The Growth of Public Debt: Sustainability, Fiscal Rules, and Monetary Rules," IMF Working Paper 86/8, (Washington: International Monetary Fund).

Public Sector Borrowing Requirements Under Alternative Reform Scenarios
(In percent of GDP)



Mexico: Adustment to Budget Balance for Fiacal Impulse Measures

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
					(In billions of Mexican pesos)					
Budgetary revenue	**216**	**266**	**291**	**324**	**419**	**581**	**724**	**783**	**957**	**1,185**
Minus:										
Oil export income	21	21	19	20	45	74	71	46	63	103
Privatization revenue	1	1	4	3	0	0	18	13	5	13
Capital gains on debt buybacks and central bank profits	0	0	0	0	18	29	5	0	14	8
Adjusted revenue	**194**	**244**	**267**	**301**	**356**	**478**	**629**	**724**	**875**	**1,061**
Budgetary expenditure	**221**	**250**	**282**	**325**	**419**	**572**	**755**	**831**	**1,009**	**1,236**
Of which: Interest payments	49	43	36	33	69	91	91	102	139	170
Of which: Transfers to IPAB	0	0	0	0	15	20	40	10	24	34
Noninterest budgetary expenditure 1/	**172**	**207**	**247**	**292**	**335**	**461**	**624**	**719**	**846**	**1,032**
Plus:										
Net cost of PIDIREGAS	0	0	0	0	0	1	6	35	46	48
Inflation adjustment to indexed bonds	0	0	0	0	16	15	12	18	15	13
Interest cost of bank restructuring and debtor support	0	0	0	0	35	71	84	145	177	116
Adjusted expenditure 2/	**221**	**250**	**282**	**326**	**470**	**660**	**857**	**1,028**	**1,248**	**1,413**
Adjusted noninterest expenditure 3/	**172**	**207**	**247**	**292**	**335**	**463**	**630**	**754**	**892**	**1,081**
Memorandum items:										
Financial requirements of development banks	8	12	33	45	-17	-15	-33	-15	-16	-1
Nonrecurrent costs of banking sector programs	0	0	0	0	68	185	96	68	31	-29
GDP	949	1,125	1,256	1,420	1,837	2,526	3,174	3,845	4,588	5,432
Potential GDP	927	1,103	1,256	1,414	2,027	2,762	3,387	4,071	4,882	5,589
					(In percent of GDP)					
Adjusted fiscal impulse										
Actual revenue	20.4	21.7	21.3	21.2	19.4	18.9	19.8	18.8	19.1	19.5
Actual expenditure	23.3	22.2	22.5	22.9	25.6	26.1	27.0	26.7	27.2	26.0
Neutral revenue	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6
Neutral expenditure	22.0	22.0	22.5	22.4	24.8	24.6	24.0	23.8	23.9	23.1
Total impulse	-3.2	-2.3	0.2	0.6	2.0	1.2	0.6	0.9	0.1	-0.9
Revenue	1.4	-1.2	0.4	0.1	1.8	0.4	-0.9	1.0	-0.2	-0.5
Expenditure	-4.6	-1.1	-0.2	0.6	0.2	0.8	1.4	-0.1	0.3	-0.4
Adjusted primary fiscal impulse										
Actual revenue	20.4	21.7	21.3	21.2	19.4	18.9	19.8	18.8	19.1	19.5
Actual noninterest expenditure	18.1	18.4	19.7	20.6	18.2	18.3	19.8	19.6	19.4	19.9
Neutral revenue	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6
Neutral noninterest expenditure	19.2	19.3	19.7	19.6	21.7	21.5	21.0	20.8	20.9	20.2
Primary impulse 3/	1.0	-1.1	1.3	1.1	-2.6	0.7	1.1	0.9	-0.5	0.7
Revenue	1.4	-1.2	0.4	0.1	1.8	0.4	-0.9	1.0	-0.2	-0.5
Noninterest expenditure	-0.5	0.1	0.9	1.0	-4.5	0.3	2.0	-0.1	-0.3	1.1

Sources: Secretariat of Finance and Public Credit; and Fund staff es

1/ Excludes interest payments and transfers to IPAB which are treated as interest expenditure.

2/ Excludes financial requirements of development banks and non-recurrent costs of bank restructuring programs.

3/ Excludes interest payments, inflation adjustment of indexed bonds and transfers to IPAB which are treated as interest expenditure.

IV. Inflation and the Exchange Rate, 1995–2000[1]

A. Introduction

1. This section examines the evolving relationship between inflation and the exchange rate in Mexico during the period 1995–2000, using fixed and time-varying coefficient models. This involved regressing inflation on changes in the exchange rate. Ideally, it would be preferable to estimate inflation models including a wide range of macroeconomic variables that usually have a bearing on inflation,[2] such as the rate of change of the exchange rate, wages, and the output gap. However, the estimation of more complete inflation models proved difficult in this case, as the period at hand was marked by the onset of (and the steady recuperation from) the economic and financial crisis of 1994–95. In this context, the inflation process was dominated by exchange rate developments and attempts to include "domestic" variables were not successful.[3]

2. The remainder of this paper is organized as follows. Section II discusses the inflation models used in the estimations. Section III describes the methodology and provides the rationale for estimating time-varying parameter models. Section IV presents the estimation results. Section V concludes.

B. The Models

3. Given the peculiarities of the estimation period, the rate of inflation in Mexico was assumed to depend solely on changes in the exchange rate. The transmission channel is both direct through its impact on the price of tradeable goods, and indirect through its effect on the price of nontradeables that use tradeable inputs and on inflation expectations. If changes in the exchange rate are contemporaneously transmitted to inflation, it would be appropriate to estimate a static (or equilibrium) model as follows:

$$(1)\ \text{Log}(P_t/P_{t-1}) = a + b\text{Log}(E_t/E_{t-1}) + \varepsilon_t$$

where

P_t = consumer price index in period t;
E_t = exchange rate (Mex$ per U.S. dollar) in period t; and
ε_t = white noise.

---

[1] Prepared by Ricardo Velloso (WHD).

[2] Attempts to estimate more comprehensive inflation models for Mexico include Lizondo (1992) and Garcés Díaz (1999).

[3] The coefficient of wage settlements was insignificant while the output gap coefficient was significant, but had the wrong sign. The latter was not entirely surprising given that inflation shot up during a recession (given the sharp depreciation of the peso) and steadily came down as production rebounded and the output gap closed.

4. In practice, however, it may take time for changes in the exchange rate to be reflected in the inflation rate. In this case, a dynamic (or disequilibrium) specification of the inflation model would be more appropriate, and its precise specification would depend on the adjustment mechanism.[4] A parsimonious mechanism (and one that is common in the literature) uses a simple partial adjustment in which the change in the actual rate of inflation between periods t and t-1 is related to the difference between the notional (or projected) rate of inflation in period t and the actual rate of inflation in period t-1. In this case, the inflation model would be specified as follows:

$$(2)\ \text{Log}(P_t/P_{t-1}) = \gamma a + \gamma b\text{Log}(E_t/E_{t-1}) + (1-\gamma)\text{Log}(P_{t-1}/P_{t-2}) + \gamma\varepsilon_t$$

where

γ = coefficient of adjustment ($0<\gamma<1$); and
γb and b are, respectively, the short- and long-term exchange rate elasticities.

5. Although largely used because it introduces only one more parameter to be estimated, the partial-adjustment mechanism has one important shortcoming. It assumes that the largest effect of any change in the independent variables occurs in the initial period and steadily declines thereafter. In contrast, it could be argued that a more appropriate lag effect, perhaps due to menu costs[5] of adjusting prices, would build up gradually over time and would decline after a certain point.

6. The traditional approach to dealing with problems related to imposing an arbitrary lag structure on the data has been to test different specifications, picking the one that best fits the data.[6] A flexible approach would then be to estimate the following model:

$$(3)\ \text{Log}(P_t/P_{t-1}) = a + b_1\text{Log}(E_t/E_{t-1}) + b_2\text{Log}(E_{t-1}/E_{t-2}) + \ldots + b_j\text{Log}(E_{t-j+1}/E_{t-j}) + \mu_t$$

7. While both the partial-adjustment mechanism (2) and the more flexible one described above (3) represent an important improvement over the static model (1), they assume that the parameters 'a' and 'b' (or a and b_1 through b_j) do not change over time. This may not be a realistic assumption, especially in the presence of structural change. In the case of Mexico, structural change in the relationship between inflation and changes in the exchange rate could be triggered by nonlinearities related to exchange rate volatility (higher in the beginning of the period and lower in the end) and the credibility of the central bank and of the monetary anchor (lower in the beginning and higher in the end). The consequences of structural change

---

[4] For a review of distributed-lag models, see Hendry, Pagan, and Sargan (1984).

[5] Menu costs refers to the cost of changing prices, both in terms of costs to the sellers (for example, from printing new menus or price lists) and to the buyers (for example, by increasing uncertainty).

[6] A more flexible way to introduce short-run dynamics was proposed by Engle and Granger (1987) based on the relationship between cointegration and error correction models.

and its implications for the need to explore more flexible inflation models are discussed below.

C. Structural Change, Time-Varying Parameters, and the Kalman Filter

8. The notion of structural breaks has been used in econometrics to study changes in the underlying economic structure or changes in the policy regime. Over the years, many tests have been proposed to verify whether the coefficients of an econometric model remain stable over time,[7] and possibly many more have been developed to incorporate time-varying coefficients.[8] A test frequently used to determine structural change—the Chow (1960) test—divides the observations into two groups and tests the null hypothesis of equality between coefficients in the two regressions using an F-statistic. The Chow test assumes that there is a single structural shift at a known point in time. However, this is often a very strong assumption, and efforts have been made to overcome this limitation.

9. Early attempts to overcome the Chow test's limitation include the CUSUM and CUSUMSQ tests by Brown, Durbin, and Evans (1975) and Dufour (1982), the Wald-type tests by Hawkins (1987), and the likelihood-ratio tests by Quandt (1960), Hawkins (1977), Worsley (1979), and Kim and Siegmond (1989). In addition, several authors have developed tests based on more general models. Chu and White (1991) examined models with both deterministic and stochastic trending regressors, and Granger and Lee (1991), Hansen (1991), and Bai (1992) studied cointegrated regressions.

10. If structural change is detected, the possibility of time-varying parameter cointegration should be considered. The natural generalization of constant parameter cointegration, assuming that X_t and Y_t are I(1), is that there exists a sequence a_t such that $Z_t = Y_t - a_t X_t$ is I(0). The task is then to find an appropriate method to estimate a_t.

11. The Kalman filter, used in some of the estimations described below, has received much attention in the literature because of two reasons. First, it is a recursive procedure for computing the unknown parameter a_t and their variance based on the observations up to and including t.[9] Second, the Kalman filter opens the way for the maximum likelihood estimation conditional on the data observed to that point. For example, assuming that a_t follows a random walk, the state space representation of the Kalman filter model consists of $Y_t = a_t X_t + \varepsilon_t$ and $a_t = a_{t-1} + \xi_t$, where ε_t and ξ_t are white noise. In terms of the inflation model, this would be translated into estimating the following system of equations:

$$(4)\ \text{Log}(P_t/P_{t-1}) = a_t + b_{1t}\text{Log}(E_t/E_{t-1}) + b_{2t}\text{Log}(E_{t-1}/E_{t-2}) + \ldots + b_{jt}\text{Log}(E_{t-j+1}/E_{t-j}) + \zeta_t$$

---

[7] See Krishnaiah and Miao (1988) and Tsumuri (1988) for surveys of the literature on testing parameter constancy in linear models.

[8] For instance, see Chow (1984).

[9] The Kalman filter may be viewed as a Bayesian method. However, there is no need to supply priors, which are calculated from the initial observations of the sample.

and

$a_t = a_{t-1} + \xi_t$

$b_{1t} = b_{1t-1} + \psi_{1t}$

$b_{2t} = b_{2t-1} + \psi_{2t}$

$b_{jt} = b_{jt-1} + \psi_{jt}$

D. Estimation Results

12. The dynamic models described above were estimated by OLS using monthly data for January 1995–December 2000.[10] The regressions were estimated for two separate sets of dependent variables: inflation as measured by changes (i) in the consumer price index and (ii) in its core component.[11] In addition, the more flexible dynamic model was estimated by maximum likelihood using the Kalman filter. The main results are described in Tables 1–4.

13. Table 1 shows that in the case of the overall CPI inflation the short-term exchange rate coefficient was 0.05, while in the case of the core CPI inflation it was 0.02. The long-term exchange rate coefficients for the overall and core CPI inflation were, respectively, 0.3 and 0.2.[12] Therefore, some 20 percent of the impact of the exchange rate on the overall CPI occurs in the short run, while the corresponding figure for the core CPI is only about 10 percent. The exchange rate elasticity is higher and has a quicker impact on prices when agricultural and administered prices are included, perhaps indicating the higher concentration of tradeables and (exchange rate) indexation mechanisms in that group of products.

14. Tables 2 and 3, which include only the statistically significant coefficients, show a similar pattern, i.e., the exchange rate elasticity is higher and has a quicker impact on prices for the overall CPI, but reveal that most of the impact is concentrated within six (overall CPI) and eight (core CPI) months. In addition, the coefficient of the contemporaneous elasticity is not significant in both cases.

15. Table 4 shows the ratios of the time-varying exchange rate coefficients in 2000 (end of period and period average) vis-à-vis 1999, 1998, and 1997.[13] It is interesting to note that

---

[10] The floating exchange rate regime was introduced in December 1994, but this came late in the month and, as a result, the full effect of the new regime was only felt in January 1995.

[11] Core inflation in Mexico excludes the effects of volatile prices (e.g., agricultural products) and prices administered or controlled by the government (e.g., some public utilities).

[12] As derived from equation (2), the long-run coefficient was calculated by dividing the estimated short-term coefficient by one minus the estimated coefficient of the lagged dependent variable.

[13] The estimated coefficients for each month as well as other statistics may be obtained directly with the author.

while the exchange rate elasticities have declined in the case of the overall CPI (with a few exceptions), they have increased in the case of the core CPI (also with a few exceptions).

E. Conclusion

16. This paper found mixed evidence regarding the behavior of the pass through effect of exchange rate changes on inflation. On the one hand, estimates using the overall CPI seem to indicate a reduction of the effect of changes in the exchange rate on inflation. On the other, estimates based on the core CPI point toward an increase in the pass through. However, in both cases, the pass through effect, although significant, does not appear to have been particularly high over the period January 1995 through December 2000. While it is always difficult to draw policy implications based on mixed evidence, the bottom line seems to be that exchange rate developments should continue to be carefully monitored in assessing inflation pressures.

List of References

Bai, J., 1992, "Econometric Estimation of Structural Change," Ph.D. Dissertation, Economics Department, UC Berkeley.

Brown, R., J. Durbin, and J. Evans, 1975, "Techniques for Testing the Constancy of Regression Relationships over Time," *Journal of the Royal Statistical Society*, Series B, 37, pp. 149–92.

Chow, G., 1960, "Tests of Equality Between Sets of Coefficients in Two Linear Regressions," Econometrica, 28, pp. 591–605.

_____, 1984, "Random and Changing Coefficient Models," in Griliches, Z. and M. Intriligator (eds.) "Handbook of Econometrics," Volume II, North-Holland.

Chu, C., and H. White, 1991, "Testing for Structural Change in Some Simple Time Series Models," Discussion Paper 91-6, UC San Diego.

Dufour, J., 1982, "Recursive Stability Analysis of Linear Regression Relationships: An Explanatory Methodology," *Journal of Econometrics*, 19, pp. 31–76.

Engle, R., and C. Granger, 1987, "Co-Integration and Error Correction: Representation, Estimation, and Testing," Econometrica, 55, pp. 251–76.

Garcés Díaz, D., 1999, "Determinación del Nivel de Precios y la Dinámica Inflacionaria en Mexico," BOM Discussion Paper No. 9907.

Granger, C., and H. Lee, 1991, "An Introduction to Time-Varying Parameter Cointegration" in Hackl, P. and A. Westlund (eds.) "Economic Structural Change: Analysis and Forecasting," Springer-Verlag.

Hansen, B., 1991, "Tests for Parameter Instability in Regressions with I(0) Processes," University of Rochester, unpublished manuscript.

Hawkins, D. L., 1987, "A Test for a Change in Point in a Parametric Model Based on a Maximal Wald-type Statistics," Sankhya, 49, pp. 368–76.

Hawkins, D. M., 1977, "Testing a Sequence of Observations for a Shift in Location," *Journal of the American Statistical Association*, 72, pp. 180–86.

Hendry, D., A. Pagan, and J. Sargan, 1984, "Dynamic Specification," in Griliches, Z. and M. Intriligator (eds.) "Handbook of Econometrics," Volume II, North-Holland.

Kim, H., and D. Siegmond, 1989, "The Likelihood Ratio Test for a Change Point in Simple Linear Regression," Biometrika, 76, pp. 409–23.

Krishnaiah, P., and B. Miao, 1988, "Review about Estimation of Change Points," in Krishnaiah, P. and C. Rae (eds.), Handbook of Statistics, Volume 7, Elsevier.

Lizondo, S.,1992, "The Dynamic of Inflation, 1988–91" in Loser, C. and E. Kalter (eds.) "Mexico: The Strategy to Achieve Sustained Economic Growth," IMF Occasional Paper No. 99 (Washington: International Monetary Fund).

Quandt, R., 1960, "Tests of the Hypothesis that a Linear Regression System Obeys Two Separate Regimes," *Journal of the American Statistical Association*, 55, pp. 324–30.

Tsurumi, H., 1988, "Survey of Bayesian and Non-Bayesian Testing of Model Stability in Econometrics," in Spall, J. (ed.) "Bayesian Analysis of Time Series and Dynamic Linear Models, Marcel Dekker;

Worsley, K., 1979, "On the Likelihood Ratio Test for a Shift in Locations of Normal Populations," *Journal of the American Statistical Association*, 72, pp. 180–86.

Table 1. Mexico: Partial-Adjustment Dynamic Equations of Inflation and the Exchange Rate, January 1995–December 2000 1/

	CPI	Core CPI
Constant		
Coefficient	0.00089	0.00042
Standard deviation	0.00057	0.00044
Exchange rate		
Coefficient	0.05418	0.02305
Standard deviation	0.02269	0.01750
CPI (-1)		
Coefficient	0.82874	...
Standard deviation	0.06233	...
Core CPI (-1)		
Coefficient	...	0.89706
Standard deviation	...	0.04808
R-squared	0.73	0.84
Adjusted R-squared	0.72	0.83
LM het. Test	33.7	33.5
Jarque-Bera test	178.3	331.7
Ramsey's RESET2	1.9	2.0
F (zero slopes)	90.3	174.3
Schwarz B.I.C.	-310.4	-328.8
Log likelihood	316.8	335.2

Source: Fund staff estimates.

1/ Estimated by ordinary least squares (OLS).

Table 2. Mexico: Fixed-Coefficient Dynamic Equation of CPI Inflation and the Exchange Rate, January 1995–December 2000 1/

	Coefficient	Standard Deviation
Constant	0.0049	0.0003
Exchange rate		
(t-1)	0.06948	0.02623
(t-2)	0.08580	0.02535
(t-3)	0.08522	0.02101
(t-4)	0.06462	0.02062
(t-5)	0.04242	0.01360
R-squared	0.49	
Adjusted R-squared	0.45	
LM het. Test	0.36	
Durbin-Watson	0.73	
Jarque-Bera test	6.24	
Ramsey's RESET2	0.003	
F (zero slopes)	11.6	
Schwarz B.I.C.	-298.5	
Log likelihood	311.1	

Source: Fund staff estimates.

1/ Estimated by ordinary least squares (OLS).

Table 3. Mexico: Fixed-Coefficient Dynamic Equation of Core CPI Inflation and the Exchange Rate, January 1995–December 2000 1/

	Coefficient	Standard Deviation
Constant	0.0048	0.0003
Exchange rate		
(t-2)	0.06838	0.02562
(t-3)	0.07930	0.02589
(t-4)	0.06519	0.02402
(t-5)	0.04789	0.02067
(t-7)	0.02778	0.01337
R-squared	0.39	
Adjusted R-squared	0.34	
LM het. Test	0.54	
Durbin-Watson	0.75	
Jarque-Bera test	3.17	
Ramsey's RESET2	0.34	
F (zero slopes)	7.67	
Schwarz B.I.C.	-291.1	
Log likelihood	303.6	

Source: Fund staff estimates.

1/ Estimated by ordinary least squares (OLS).

Table 4. Mexico: Time-Varying Coefficient Dynamic Equations of CPI Inflation and the Exchange Rate, January 1995–December 2000 1/

	Ratio of the Exchange Rate Coefficients		
	2000/1999	2000/1998	2000/1997
		End of period	
CPI equation			
Total	**0.96**	**0.99**	**0.85**
(t-1)	0.97	0.93	0.63
(t-2)	0.93	0.89	0.74
(t-3)	0.99	0.93	1.05
(t-4)	0.97	1.35	1.42
(t-5)	0.98	1.14	0.68
Core CPI equation			
Total	**1.14**	**1.42**	**1.05**
(t-2)	1.12	1.15	0.64
(t-3)	1.10	1.19	1.02
(t-4)	1.16	1.95	1.58
(t-5)	1.16	1.88	1.21
(t-7)	1.22	1.48	2.73
		Period average	
CPI equation			
Total	**0.99**	**0.89**	**0.86**
(t-1)	1.02	0.79	0.61
(t-2)	0.94	0.72	0.77
(t-3)	1.02	1.01	1.07
(t-4)	0.99	1.27	1.45
(t-5)	1.00	0.83	0.66
Core CPI equation			
Total	**1.15**	**0.96**	**1.03**
(t-2)	1.10	0.73	0.66
(t-3)	1.17	0.89	1.20
(t-4)	1.19	1.66	1.74
(t-5)	1.24	1.24	1.25
(t-7)	1.30	1.70	6.08

Source: Fund staff estimates.

1/ Estimated by maximum likelihood (Kalman filter).

Table 1. Mexico: Saving and Investment

	1996	1997	1998	1999	Prel. 2000
	(In millions of Mexican pesos)				
Gross domestic investment	**583,558**	**820,957**	**932,506**	**1,082,395**	**1,265,807**
Public sector	75,753	98,255	100,151	132,195	216,834
Private sector	375,327	521,239	703,851	841,514	918,760
Inventory increase	132,477	201,463	128,505	108,687	130,213
Gross national saving	**565,851**	**761,972**	**785,514**	**947,707**	**1,094,854**
Public sector	-95,246	-3,428	-74,222	2,832	121,287
Private sector	661,098	765,400	859,736	944,875	973,567
Foreign saving	**17,707**	**58,985**	**146,993**	**134,689**	**170,953**
	(In percent of GDP)				
Gross domestic investment	**23.1**	**25.9**	**24.3**	**23.6**	**23.3**
Public sector	3.0	3.1	2.6	2.9	4.0
Private sector 1/	20.1	22.8	21.6	20.7	19.3
Gross national saving	**22.4**	**24.0**	**20.4**	**20.7**	**20.2**
Public sector 2/	-3.8	-0.1	-1.9	0.1	2.2
Private sector	26.2	24.1	22.4	20.6	17.9
Foreign saving	**0.7**	**1.9**	**3.8**	**2.9**	**3.1**

Sources: National Institute of Statistics and Geography; Secretariat of Finance and Public Credit; and Fund staff estimates.

1/ Includes change in stocks.
2/ Based on operational balance.

Table 2. Mexico: National Accounts by Expenditure at Constant Prices 1/

	1996	1997	1998	1999	2000	Jan.–Mar. 2000	Jan.–Mar. 2001
	(In millions of Mexican pesos at 1993 prices)						
Real GDP	**1,294,197**	**1,381,839**	**1,451,351**	**1,504,971**	**1,609,138**	**1,575,415**	**1,604,825**
Less: resource balance	42,412	10,277	-5,013	-11,847	-40,594	-27,378	-37,304
Exports of goods, nonfactor services	347,312	384,530	431,059	484,570	561,918	515,334	539,382
Imports of goods, nonfactor services	304,901	374,253	436,072	496,417	602,513	542,712	576,686
Gross domestic expenditure	**1,251,785**	**1,371,562**	**1,456,364**	**1,516,818**	**1,649,733**	**1,549,740**	**1,618,526**
Consumption	1,013,265	1,073,801	1,127,053	1,175,083	1,277,119	1,203,079	1,267,116
General government	139,610	143,648	146,741	152,692	158,049	152,322	147,797
Private sector	873,656	930,152	980,312	1,022,391	1,119,070	1,050,757	1,119,319
Gross domestic investment	238,520	297,761	329,311	341,735	372,614	346,661	351,409
Public sector	37,992	41,837	36,087	41,120	44,661	30,062	33,451
Private sector	170,869	210,960	242,701	259,100	285,546	286,536	284,508
Inventory change	29,659	44,964	50,523	41,515	42,407	30,062	33,451
	(Annual percentage change)						
Real GDP	**5.2**	**6.8**	**5.0**	**3.7**	**6.9**	**7.7**	**1.9**
Exports of goods, nonfactor services	18.2	10.7	12.1	12.4	16.0	17.3	4.7
Imports of goods, nonfactor services	22.9	22.7	16.5	13.8	21.4	24.9	6.3
Gross domestic expenditure	**5.6**	**9.6**	**6.2**	**4.2**	**8.8**	**10.0**	**4.4**
Consumption	1.8	6.0	5.0	4.3	8.7	8.9	5.3
General government	-0.7	2.9	2.2	4.1	3.5	3.9	-3.0
Private sector	2.2	6.5	5.4	4.3	9.5	9.6	6.5
Gross domestic investment	25.7	24.8	10.6	3.8	9.0	10.9	1.4
Public sector	-14.8	10.1	-13.7	13.9	8.6	-4.5	11.3
Private sector (fixed investment)	26.7	23.5	15.0	6.8	10.2	12.8	-0.7

Source: National Institute of Statistics and Geography.

Table 3. Mexico: National Accounts by Expenditure at Current Prices

(In millions of Mexican pesos)

	1996	1997	1998	1999	2000	Jan.–Mar. 2000	Jan.–Mar. 2001
GDP at current market prices	**2,525,575**	**3,174,275**	**3,844,917**	**4,588,466**	**5,432,355**	**5,230,947**	**5,701,643**
Less: resource balance	**53,403**	**-1,672**	**-77,880**	**-72,565**	**-99,259**	**-49,250**	**-90,895**
Exports of goods, nonfactor serv	812,854	963,937	1,184,121	1,414,339	1,705,714	1,562,982	1,678,842
Imports of goods, nonfactor serv	759,451	965,609	1,262,001	1,486,904	1,804,973	1,612,232	1,769,737
Gross domestic expenditure	**2,472,172**	**3,175,947**	**3,922,797**	**4,661,031**	**5,531,614**	**5,280,197**	**5,792,538**
Consumption	1,888,614	2,354,990	2,990,291	3,578,635	4,265,807	4,041,657	4,576,191
General government	243,706	314,622	401,533	500,801	596,519	492,082	513,068
Private sector	1,644,908	2,040,368	2,588,757	3,077,835	3,669,288	3,549,575	4,063,123
Gross domestic investment	583,558	820,957	932,506	1,082,395	1,265,807	1,238,540	1,216,347
Public sector 1/	75,753	98,255	100,151	132,195	216,834	162,607	156,159
Private sector	375,327	521,239	703,851	841,514	918,760	894,509	1,001,638
Inventory change	132,477	201,463	128,505	108,687	130,213	181,424	58,549

Sources: National Institute of Statistics and Geography; and Fund staff estimates.

1/ Beginning in 2000, includes PIDIREGAS as public investment.

Table 4. Mexico: Sectoral Origin of Gross Domestic Product at Constant Prices

	1996	1997	1998	1999	2000	Jan.–Mar. 2000	Jan.–Mar. 2001
	(In millions of Mexican pesos at 1993 prices)						
Gross domestic product	**1,294,197**	**1,381,839**	**1,451,351**	**1,505,846**	**1,609,138**	**1,575,415**	**1,604,825**
Net taxes	104,121	111,095	116,764	121,249	129,641	167,709	172,091
Gross value added, in basic values	1,221,772	1,305,811	1,371,609	1,423,887	1,521,135	1,448,466	1,475,507
Agriculture, forestry, and fisheries	76,984	77,106	79,439	81,049	82,758	81,215	76,742
Mining	17,538	18,323	18,824	18,431	19,174	18,938	18,976
Manufacturing	241,152	265,113	284,643	296,528	317,482	309,411	305,833
Construction	50,449	55,132	57,461	60,329	63,343	61,167	58,862
Electricity, water, and gas	20,512	21,580	21,979	23,718	25,187	23,489	23,952
Trade, hotels, and restaurants	237,859	263,313	278,161	287,749	319,592	298,881	316,368
Transport, storage, and communications	120,001	131,923	140,716	151,676	170,914	165,495	175,053
Financial services, insurance, and real estate	193,627	200,847	210,097	218,227	228,024	223,829	232,070
Personal, social, and professional services	263,652	272,474	280,288	286,181	294,661	306,802	310,422
Less: imputed banking services	(31,697)	(35,067)	(37,022)	(39,290)	(41,638)	(40,760)	(42,772)
	(In percent of GDP)						
Gross domestic product	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Of which:							
Agriculture, forestry, and fisheries	5.9	5.6	5.5	5.4	5.1	5.2	4.8
Mining	1.4	1.3	1.3	1.2	1.2	1.2	1.2
Manufacturing	18.6	19.2	19.6	19.7	19.7	19.6	19.1
Construction	3.9	4.0	4.0	4.0	3.9	3.9	3.7
Electricity, water, and gas	1.6	1.6	1.5	1.6	1.6	1.5	1.5
Trade, hotels, and restaurants	18.4	19.1	19.2	19.1	19.9	19.0	19.7
Transport, storage, and communications	9.3	9.5	9.7	10.1	10.6	10.5	10.9
Financial services, insurance, and real estate	15.0	14.5	14.5	14.5	14.2	14.2	14.5
Personal, social, and professional services	20.4	19.7	19.3	19.0	18.3	19.5	19.3
Less: imputed banking services	-2.4	-2.5	-2.6	-2.6	-2.6	-2.6	-2.7
	(Annual percentage change)						
Gross domestic product	**5.2**	**6.8**	**5.0**	**3.8**	**6.9**	**7.7**	**1.9**
Agriculture, forestry, and fisheries	3.8	0.2	3.0	2.0	2.1	-0.4	-5.5
Mining	8.1	4.5	2.7	-2.1	4.0	2.4	0.2
Manufacturing	10.8	9.9	7.4	4.2	7.1	9.7	-1.2
Construction	9.8	9.3	4.2	5.0	5.0	6.9	-3.8
Electricity, water, and gas	4.6	5.2	1.9	7.9	6.2	7.1	2.0
Trade, hotels, and restaurants	4.8	10.7	5.6	3.4	11.1	12.3	5.9
Transport, storage and communications	8.0	9.9	6.7	7.8	12.7	14.1	5.8
Financial services, insurance, and real estate	0.6	3.7	4.6	3.9	4.5	4.9	3.7
Personal, social, and professional services	1.0	3.3	2.9	2.1	3.0	3.4	1.2

Source: National Institute of Statistics and Geography.

Table 5. Mexico: Indicators of Investment Activity

	Investment	Construction	Domestic Production of Machinery and Equipment	Imports of Capital Goods
	(1993 = 100, period average, in real terms)			
1996	**89.6**	**92.8**	**75.6**	**96.2**
I	79.5	83.9	67.7	81.2
II	84.8	89.5	67.4	91.2
III	90.4	96.6	71.4	94.8
IV	103.6	101.0	95.7	117.6
1997	**108.4**	**102.6**	**98.8**	**131.5**
I	94.6	92.6	86.8	106.9
II	106.1	101.8	89.4	133.0
III	110.9	107.8	98.0	131.0
IV	122.1	108.3	121.0	154.9
1998	**119.6**	**106.7**	**113.0**	**155.9**
I	115.7	101.7	111.5	152.5
II	117.4	103.0	109.0	159.0
III	121.6	112.5	110.7	153.6
IV	123.5	109.6	120.6	158.6
1999	**135.8**	**114.8**	**117.7**	**202.5**
I	122.5	106.1	112.2	170.7
II	126.7	109.1	111.4	182.9
III	129.9	116.0	108.0	184.1
IV	135.9	116.4	123.2	194.2
2000	**140.6**	**115.8**	**121.0**	**217.5**
I	135.8	113.4	122.7	200.6
II	140.0	116.8	120.2	213.7
III	144.4	122.0	117.9	222.5
IV	146.3	117.7	123.1	236.0
2001				
I	136.4	109.2	121.2	214.6
		(Percentage change)		
1996	**16.4**	**11.6**	**20.5**	**25.2**
I	-3.8	-4.1	-4.0	-3.1
II	17.5	10.7	30.4	25.6
III	26.3	24.1	27.7	30.6
IV	27.4	17.0	31.6	49.9
1997	**21.0**	**10.6**	**30.8**	**36.7**
I	18.9	10.3	28.2	31.7
II	25.1	13.7	32.7	45.8
III	22.7	11.6	37.2	38.2
IV	17.8	7.3	26.4	31.7
1998	**10.3**	**4.0**	**14.3**	**18.6**
I	22.4	9.8	28.5	42.7
II	10.6	1.2	22.0	19.5
III	9.6	4.4	12.9	17.3
IV	1.2	1.2	-0.3	2.4
1999	**13.6**	**7.6**	**4.2**	**29.8**
I	5.8	4.3	0.6	11.9
II	8.0	5.9	2.2	15.0
III	6.9	3.1	-2.4	19.8
IV	10.1	6.1	2.1	22.4
2000	**3.5**	**0.9**	**2.8**	**7.4**
I	10.9	6.9	9.4	17.6
II	10.5	7.1	7.9	16.8
III	11.1	5.2	9.2	20.9
IV	7.6	1.1	-0.1	21.5
2001				
I	0.4	-3.8	-1.2	6.9

Source: Bank of Mexico.

Table 6. Mexico: Index of Industrial Production

(1993 = 100, period average)

	General Index	Mining	Manufacturing	Construction	Electricity
	(1993 = 100, period average, in real terms)				
1996	**106.4**	**107.9**	**109.6**	**91.1**	**111.9**
I	102.3	107.2	106.8	82.4	103.4
II	104.7	106.5	108.3	88.0	110.4
III	107.0	106.7	109.1	94.9	119.0
IV	111.5	111.1	114.3	99.2	114.8
1997	**116.2**	**112.7**	**120.5**	**99.6**	**117.8**
I	108.3	107.7	112.9	89.8	109.5
II	117.0	113.1	122.1	98.7	115.6
III	118.1	114.1	121.2	104.6	125.8
IV	121.4	116.0	125.9	105.1	120.1
1998	**123.6**	**115.8**	**129.4**	**103.8**	**119.9**
I	119.8	114.9	126.2	98.9	111.1
II	123.2	117.1	129.8	100.2	118.9
III	125.8	115.5	130.5	109.4	129.2
IV	125.4	115.7	131.2	106.6	120.5
1999	**133.3**	**115.9**	**140.0**	**111.8**	**133.7**
I	122.5	113.8	128.3	103.3	119.7
II	129.2	113.3	136.2	106.2	129.0
III	131.8	113.3	137.4	113.0	138.5
IV	131.5	113.0	137.5	113.3	130.4
2000	**136.1**	**117.7**	**143.3**	**112.8**	**136.1**
I	133.3	116.5	140.7	110.5	128.2
II	138.4	120.2	146.0	113.7	137.6
III	140.7	120.4	147.1	118.8	147.5
IV	136.4	114.6	143.6	114.5	136.5
2001					
I	131.5	116.7	139.1	106.3	130.7
	(Percentage change)				
1996	**10.1**	**8.1**	**10.8**	**9.8**	**4.6**
I	3.2	7.7	4.9	-5.6	1.9
II	11.2	6.8	12.7	9.0	3.8
III	13.8	6.1	13.4	22.1	6.4
IV	12.4	11.8	12.4	15.1	5.9
1997	**9.3**	**4.5**	**10.0**	**9.3**	**5.2**
I	5.9	0.5	5.7	9.0	5.9
II	11.8	6.2	12.8	12.2	4.7
III	10.4	6.9	11.1	10.2	5.7
IV	8.9	4.4	10.2	6.0	4.6
1998	**6.3**	**2.7**	**7.4**	**4.2**	**1.9**
I	10.6	6.7	11.7	10.1	1.5
II	5.3	3.6	6.4	1.5	2.9
III	6.5	1.2	7.7	4.6	2.7
IV	3.3	-0.3	4.2	1.4	0.3
1999	**7.9**	**0.1**	**8.2**	**7.7**	**11.5**
I	2.3	-1.0	1.7	4.5	7.7
II	4.8	-3.2	4.9	6.0	8.5
III	4.7	-1.8	5.3	3.3	7.2
IV	4.9	-2.3	4.8	6.3	8.2
2000	**2.1**	**1.6**	**2.4**	**0.9**	**1.8**
I	8.8	2.4	9.7	6.9	7.1
II	7.1	6.1	7.2	7.0	6.7
III	6.7	6.3	7.1	5.2	6.5
IV	3.8	1.4	4.4	1.1	4.6
2001					
I	-1.3	0.2	-1.1	-3.8	2.0

Source: Bank of Mexico.

Table 7. Mexico: Production, Employment, Productivity, and Unit Labor Costs in Manufacturing

(1993 = 100, period average)

	Production	Employment	Productivity	Unit Labor Costs /1
1996	**109.6**	**90.5**	**125.7**	**65.4**
I	106.8	89.3	124.7	64.9
II	108.3	90.1	125.8	64.5
III	109.1	90.3	122.7	63.3
IV	114.3	92.2	129.8	68.9
1997	**120.5**	**94.7**	**130.9**	**62.0**
I	112.9	93.4	129.3	61.7
II	122.1	94.7	131.4	60.1
III	121.2	94.6	128.8	59.6
IV	125.9	96.2	133.9	66.6
1998	**129.4**	**98.2**	**136.4**	**61.2**
I	126.2	97.6	135.7	59.4
II	129.8	98.7	136.9	60.1
III	130.5	98.1	134.4	59.4
IV	131.2	98.5	138.7	65.9
1999	**134.8**	**98.8**	**139.0**	**60.6**
I	128.3	98.5	136.6	59.4
II	136.2	98.5	140.6	58.5
III	137.4	98.7	136.8	58.7
IV	137.5	99.7	142.2	65.9
2000	**144.4**	**99.7**	**145.1**	**61.5**
I	140.7	100.0	141.5	58.7
II	146.0	100.3	146.2	60.3
III	147.1	99.4	145.0	58.7
IV	143.6	99.2	147.9	68.0
2001				
I	139.1	98.1	144.6	61.3
		(Percentage change)		
1996	**10.8**	**2.3**	**9.1**	**-18.3**
I	4.9	-2.7	10.4	-24.4
II	12.7	1.8	11.2	-20.0
III	13.4	4.9	8.0	-16.5
IV	12.4	5.6	6.8	-11.6
1997	**10.0**	**4.7**	**4.1**	**-5.2**
I	5.7	4.7	3.7	-4.8
II	12.8	5.1	4.5	-6.8
III	11.1	4.7	5.0	-5.8
IV	10.2	4.4	3.2	-3.4
1998	**7.4**	**3.7**	**4.2**	**-1.3**
I	11.7	4.5	4.9	-3.8
II	6.4	4.2	4.2	0.0
III	7.7	3.7	4.3	-0.3
IV	4.2	2.4	3.5	-1.0
1999	**4.2**	**0.6**	**1.9**	**-1.0**
I	1.7	0.9	0.7	0.1
II	4.9	-0.1	2.7	-2.7
III	5.3	0.6	1.8	-1.3
IV	4.8	1.2	2.5	0.0
2000	**7.1**	**0.9**	**4.4**	**1.4**
I	9.7	1.6	3.6	-1.2
II	7.2	1.8	4.0	3.2
III	7.1	0.7	6.0	0.1
IV	4.4	-0.5	4.0	3.2
2001				
I	-1.1	-2.0	2.2	4.4

Sources: National Institute of Statistics and Geography; and staff estimates.

1/ In real terms.

Table 8. Mexico: Consumer Price Index

(1994 = 100)

	General Index	Underlying Index	Underlying Merchandise	Underlying Services
1996	**181.4**	**181.7**	**197.3**	**162.6**
I	166.3	166.7	179.4	151.1
II	177.9	178.6	193.9	160.0
III	186.1	186.9	203.5	166.6
IV	195.3	194.5	212.5	172.7
1997	**218.8**	**217.3**	**237.0**	**193.4**
I	208.7	206.8	225.6	183.9
II	215.8	214.9	234.6	191.0
III	221.9	220.6	240.4	196.4
IV	228.9	227.1	247.5	202.2
1998	**253.7**	**251.9**	**274.5**	**224.5**
I	240.6	238.3	258.8	213.2
II	248.5	247.6	269.2	221.3
III	256.5	255.5	278.3	227.7
IV	269.1	266.4	291.6	235.6
1999	**295.8**	**295.2**	**323.1**	**261.2**
I	285.4	282.0	309.2	248.9
II	292.9	292.9	320.9	258.9
III	298.8	299.5	327.5	265.4
IV	306.0	306.4	335.0	271.6
2000	**323.8**	**323.3**	**351.7**	**288.7**
I	315.5	315.9	344.6	281.0
II	320.8	321.8	350.5	286.8
III	325.7	325.4	353.6	291.1
IV	333.3	330.0	358.1	295.9
2001				
I	339.0	337.0	365.0	302.8
		(Percentage change)		
1996	**34.4**	**33.7**	**38.5**	**27.3**
I	48.0	48.4	57.4	37.2
II	34.1	34.3	39.7	27.1
III	30.5	29.4	33.2	24.2
IV	28.1	26.6	29.4	22.6
1997	**20.6**	**19.6**	**20.1**	**18.9**
I	25.5	24.1	25.8	21.7
II	21.3	20.3	21.0	19.4
III	19.2	18.0	18.1	17.9
IV	17.2	16.7	16.5	17.1
1998	**15.9**	**15.9**	**15.8**	**16.1**
I	15.3	15.2	14.7	15.9
II	15.1	15.2	14.7	15.9
III	15.6	15.8	15.7	16.0
IV	17.6	17.3	17.8	16.5
1999	**16.6**	**17.2**	**17.7**	**16.4**
I	18.6	18.4	19.5	16.8
II	17.9	18.3	19.2	17.0
III	16.5	17.2	17.7	16.6
IV	13.7	15.0	14.9	15.2
2000	**9.5**	**9.5**	**8.8**	**10.5**
I	10.5	12.0	11.4	12.9
II	9.5	9.8	9.2	10.8
III	9.0	8.7	8.0	9.7
IV	8.9	7.7	6.9	9.0
2001				
I	7.5	6.7	5.9	7.7

Source: Bank of Mexico.

Table 9. Mexico: Monthly Changes in the Consumer Price Index

(In percent)

	1996	1997	1998	1999	2000	2001
Over same month of previous year						
January	51.7	26.4	15.3	19.0	11.0	8.1
February	49.0	25.6	15.4	18.5	10.5	7.1
March	43.8	24.5	15.3	18.3	10.1	7.2
April	36.9	22.3	15.1	18.2	9.7	7.1
May	33.8	21.2	15.0	18.0	9.5	7.0
June	31.8	20.3	15.3	17.4	9.4	6.6
July	31.0	19.7	15.4	17.0	9.1	...
August	30.6	19.2	15.5	16.6	9.1	...
September	30.0	18.8	15.9	15.8	8.8	...
October	29.0	18.2	16.7	14.9	8.9	...
November	27.8	17.8	17.4	13.9	8.9	...
December	27.7	15.7	18.6	12.3	9.0	...
Over the previous month						
January	3.6	2.6	2.2	2.5	1.3	0.6
February	2.3	1.7	1.8	1.3	0.9	-0.1
March	2.2	1.2	1.2	0.9	0.6	0.6
April	2.8	1.1	0.9	0.9	0.6	0.5
May	1.8	0.9	0.8	0.6	0.4	0.2
June	1.6	0.9	1.2	0.7	0.6	0.2
July	1.4	0.9	1.0	0.7	0.4	...
August	1.3	0.9	1.0	0.6	0.5	...
September	1.6	1.2	1.6	1.0	0.7	...
October	1.2	0.8	1.4	0.6	0.7	...
November	1.5	1.1	1.8	0.9	0.9	...
December	3.2	1.4	2.4	1.0	1.1	...
Cumulative since the beginning of the year						
January	3.6	2.6	2.2	2.5	1.3	0.6
February	6.0	4.3	4.0	3.9	2.2	0.5
March	8.3	5.6	5.2	4.9	2.8	1.1
April	11.4	6.7	6.2	5.8	3.4	1.6
May	13.5	7.7	7.0	6.5	3.8	1.9
June	15.3	8.7	8.3	7.2	4.4	2.1
July	16.9	9.6	9.3	7.9	4.8	...
August	18.5	10.6	10.4	8.5	5.4	...
September	20.4	12.0	12.2	9.5	6.1	...
October	21.9	12.9	13.8	10.2	6.9	...
November	23.7	14.1	15.8	11.2	7.8	...
December	27.7	15.7	18.6	12.3	9.0	...

Source: Bank of Mexico.

Table 10. Mexico: Overall Balance of the Nonfinancial Public Sector 1/

	1996	1997	1998	1999	Prel. 2000
	(In millions of Mexican pesos)				
Traditional overall balance	**8,683**	**-31,411**	**-47,919**	**-52,696**	**-51,367**
Budgetary balance	5,140	-27,935	-47,564	-52,851	-52,091
Federal government 2/	-11,479	-43,172	-67,300	-80,041	-74,682
Social security and state enterprises	16,619	15,238	19,736	27,190	22,591
PEMEX 3/	9,371	-2,476	-1,873	5,761	2,404
Others	7,248	17,714	21,609	21,429	20,186
Extrabudgetary balance	2,017	377	1,481	3,028	1,705
Statistical discrepancies (balance)	1,526	-3,853	-1,836	-2,873	-980
Memorandum items:					
Adjusted balance	**-93,445**	**-123,797**	**-243,589**	**-294,719**	**-247,928**
Privatization revenue, BOM profits, and capital gains on debt buybacks 4/	28,891	23,187	12,932	19,037	20,999
Inflation adjustment to indexed bonds 5/	15,236	11,909	18,266	13,803	12,650
Net expenditure on direct PIDIREGAS projects 6/	1,493	5,668	34,620	46,022	48,252
Imputed interest on bank-restructuring and debtor-support programs 7/	71,409	84,317	144,463	178,761	115,748
Financial requirements of development banks	-14,901	-32,695	-14,611	-15,601	-1,086
Augmented balance	**-278,038**	**-219,920**	**-311,670**	**-325,414**	**-218,528**
Net capital costs of bank restructuring and debtor support 8/	184,593	96,123	68,080	30,696	-29,400
	(In percent of GDP)				
Traditional overall balance	**0.3**	**-1.0**	**-1.2**	**-1.1**	**-0.9**
Budgetary balance	0.2	-0.9	-1.2	-1.2	-1.0
Federal government 2/	-0.5	-1.4	-1.8	-1.7	-1.4
Social security and state enterprises	0.7	0.5	0.5	0.6	0.4
PEMEX 3/	0.4	-0.1	0.0	0.1	0.0
Others	0.3	0.6	0.6	0.5	0.4
Extrabudgetary balance	0.1	0.0	0.0	0.1	0.0
Statistical discrepancies (balance)	0.1	-0.1	0.0	-0.1	0.0
Memorandum items:					
Adjusted balance	**-3.7**	**-3.9**	**-6.3**	**-6.4**	**-4.6**
Privatization revenue, BOM profits, and capital gains on debt buybacks 4/	1.1	0.7	0.3	0.4	0.4
Inflation adjustment to indexed bonds 5/	0.6	0.4	0.5	0.3	0.2
Net expenditure on direct PIDIREGAS projects 6/	0.1	0.2	0.9	1.0	0.9
Imputed interest on bank-restructuring and debtor-support programs 7/	2.8	2.7	3.8	3.9	2.1
Financial requirements of development banks	-0.6	-1.0	-0.4	-0.3	0.0
Augmented balance	**-11.0**	**-6.9**	**-8.1**	**-7.1**	**-4.0**
Net capital costs of bank restructuring and debtor support 8/	7.3	3.0	1.8	0.7	-0.5

Sources: Secretariat of Finance and Public Credit; and Fund staff estimates.

1/ Public sector includes the federal government, and public enterprises and entities (under direct and indirect budgetary control). Excludes subnational governments. For adjusted and augmented measures, includes IPAB bank-restructuring and debtor-support programs, direct PIDIREGAS and financial requirements of development banks.

2/ Excludes contributions to Oil Stabilization Fund in 2000.

3/ In 1996 corrected for Mex$8.4 billion (0.3 percent of GDP) in oil-related revenue that was received in 1996, but which, under the national definition, were recorded as both revenue and expenditure.

4/ Includes unrealized valuation gains component of central bank profits, and debt buy-back profits.

5/ Inflation adjustment on the principal of indexed government securities (Udibonos, Ajustabonos, and SAR).

6/ Executed direct public investment PIDIREGAS projects (net of budgetary transfers).

7/ Includes interest cost on gross IPAB liabilities, net of federal government transfers, imputed interest on FARAC debt and on debtor-support programs.

8/ Capital cost of bank restructuring and debtor-support operations net of asset recoveries.

Table 11. Mexico: Primary Balance of the Nonfinancial Public Sector

	1996	1997	1998	1999	Prel. 2000
	(In millions of Mexican pesos)				
Primary balance	**119,488**	**99,181**	**63,831**	**112,237**	**151,509**
Budgetary balance	**119,488**	**99,181**	**63,831**	**112,237**	**151,509**
Federal government 1/	84,332	67,199	26,576	61,920	101,913
Entities under direct budgetary control	32,796	31,201	35,289	46,702	47,173
PEMEX 2/	22,681	10,722	10,751	20,275	21,541
Other entities	10,115	20,479	24,538	26,427	25,632
Entities under indirect budgetary control	2,361	782	1,966	3,615	2,423
Memorandum item:					
Adjusted primary balance 3/	**89,105**	**70,326**	**16,279**	**47,178**	**82,258**
	(In percent of GDP)				
Primary balance	**4.7**	**3.1**	**1.7**	**2.4**	**2.8**
Budgetary balance	**4.7**	**3.1**	**1.7**	**2.4**	**2.8**
Federal government 1/	3.3	2.1	0.7	1.3	1.9
Entities under direct budgetary control	1.3	1.0	0.9	1.0	0.9
PEMEX 2/	0.9	0.3	0.3	0.4	0.4
Other entities	0.4	0.6	0.6	0.6	0.5
Entities under indirect budgetary control	0.1	0.0	0.1	0.1	0.0
Memorandum item:					
Adjusted primary balance 3/	**3.5**	**2.2**	**0.4**	**1.0**	**1.5**

Sources: Secretariat of Finance and Public Credit; and Fund staff estimates.

1/ Includes statistical discrepancy. Excludes contributions to Oil Stabilization Fund in 2000.

2/ In 1996 corrected for MexS8.4 billion (0.3 percent of GDP) in oil-related revenue that was received in 1996, but which, under the national definition, were recorded as both revenue and expenditure in 1997.

3/ Excludes privatization revenue, BOM profits, and capital gains on debt buybacks. Includes net expenditure on direct PIDIREGAS. Treats transfers for bank restructuring and debtor support as interest expenditure.

Table 12. Mexico: Budgetary Revenues of the Consolidated Nonfinancial Public Sector

	1996	1997	1998	1999	Prel. 2000
	(In millions of Mexican pesos)				
Budgetary revenues 1/	**580,722**	**723,591**	**783,046**	**957,049**	**1,184,869**
Federal government	279,732	373,996	455,800	577,314	647,606
Tax revenues	226,006	312,115	404,225	522,236	578,991
Nontax revenues 2/	53,726	61,881	51,574	55,077	68,615
Parastatal sector	300,990	349,595	327,246	379,735	537,263
PEMEX	186,188	206,198	171,442	198,754	326,282
Exports	73,770	71,098	45,999	63,070	103,037
Domestic 3/	112,417	135,100	125,443	135,685	223,245
Other entities	114,803	143,397	155,804	180,981	210,982
Memorandum item:					
Adjusted budgetary revenues 4/	551,832	700,404	770,114	938,012	1,163,870
	(In percent of GDP)				
Budgetary revenues 1/	**23.0**	**22.8**	**20.4**	**20.9**	**21.8**
Federal government	11.1	11.8	11.9	12.6	11.9
Tax revenues	8.9	9.8	10.5	11.4	10.7
Nontax revenues 2/	2.1	1.9	1.3	1.2	1.3
Parastatal sector	11.9	11.0	8.5	8.3	9.9
PEMEX	7.4	6.5	4.5	4.3	6.0
Exports	2.9	2.2	1.2	1.4	1.9
Domestic 3/	4.5	4.3	3.3	3.0	4.1
Other entities	4.5	4.5	4.1	3.9	3.9
Memorandum item:					
Adjusted budgetary revenues 4/	21.8	22.1	20.0	20.4	21.4

Source: Secretariat of Finance and Public Credit.

1/ Excludes proceeds from privatization of Telmex and commercial banks (extraordinary privatization proceeds); all other privatization proceeds (ordinary privatization proceeds) are included.

2/ Excludes hydrocarbon royalties from PEMEX operations which are included under PEMEX (domestic).

3/ Includes hydrocarbon royalties that are passed on to the federal government. In 1997, excludes Mex$8.4 billion which were received in 1996, but recorded as both revenue and expenditure under the national definition.

4/ Excludes privatization revenue, unrealized valuation gains component of central bank profits, and debt buy-back profits.

Table 13. Mexico: Budgetary Expenditure of the Consolidated Nonfinancial Public Sector

	1996	1997	1998	1999	Prel. 2000
	(In millions of Mexican pesos)				
Budgetary public expenditure 1/	**575,582**	**751,526**	**830,610**	**1,009,346**	**1,236,961**
Current expenditure	492,069	643,256	713,032	885,284	1,091,478
Wages	88,070	116,401	130,357	168,742	184,803
Federal government	38,219	36,655	45,129	54,245	66,107
Social security and state enterprises	49,851	79,746	85,228	114,497	118,696
Interest payments	90,463	90,401	101,157	140,554	168,126
Federal government 2/	74,285	74,438	85,604	121,042	143,544
Social security and state enterprises	16,177	15,963	15,553	19,512	24,582
Net current transfers	101,728	148,663	198,136	246,658	305,502
Total current transfers	121,115	198,141	254,698	311,795	383,786
Transfers within the nonfinancial public sector	-19,387	-49,478	-56,562	-65,136	-78,284
Revenue sharing	70,901	94,573	113,665	140,671	178,103
Purchases of goods and services	42,013	52,095	60,012	56,797	80,344
Federal government	5,008	5,442	5,852	6,198	6,614
Social security and state enterprises	37,005	46,652	54,160	50,598	73,731
Other expenditure	98,894	141,122	109,704	131,861	174,599
Federal government	21,039	28,834	23,351	13,371	29,977
Social security and state enterprises	57,855	72,503	76,247	94,698	110,591
Cash transfers to banks and debtors	20,000	39,786	10,107	23,792	34,031
Capital spending 3/	83,514	108,270	117,577	124,062	145,482
Federal government 4/	33,292	57,059	62,901	69,784	83,489
Social security and state enterprises	50,222	51,211	54,676	54,278	61,993
Memorandum items:					
Adjusted budgetary expenditure	**592,312**	**769,103**	**883,496**	**1,069,171**	**1,297,862**
Inflation adjustment to indexed bonds 5/	15,236	11,909	18,266	13,803	12,650
Net expenditure on direct PIDIREGAS projects 6/	1,493	5,668	34,620	46,022	48,252
	(In percent of GDP)				
Budgetary public expenditure 1/	**22.8**	**23.7**	**21.6**	**22.0**	**22.8**
Current expenditure	19.5	20.3	18.5	19.3	20.1
Wages	3.5	3.7	3.4	3.7	3.4
Federal government	1.5	1.2	1.2	1.2	1.2
Social security and state enterprises	2.0	2.5	2.2	2.5	2.2
Interest payments	3.6	2.8	2.6	3.1	3.1
Federal government 2/	2.9	2.3	2.2	2.6	2.6
Social security and state enterprises	0.6	0.5	0.4	0.4	0.5
Net current transfers	4.0	4.7	5.2	5.4	5.6
Total current transfers	4.8	6.2	6.6	6.8	7.1
Transfers within the nonfinancial public sector	-0.8	-1.6	-1.5	-1.4	-1.4
Revenue sharing	2.8	3.0	3.0	3.1	3.3
Purchases of goods and services	1.7	1.6	1.6	1.2	1.5
Federal government	0.2	0.2	0.2	0.1	0.1
Social security and state enterprises	1.5	1.5	1.4	1.1	1.4
Other expenditure	3.9	4.4	2.9	2.9	3.2
Federal government	0.8	0.9	0.6	0.3	0.6
Social security and state enterprises	2.3	2.3	2.0	2.1	2.0
Cash transfers to banks and debtors	0.8	1.3	0.3	0.5	0.6
Capital spending 3/	3.3	3.4	3.1	2.7	2.7
Federal government 4/	1.3	1.8	1.6	1.5	1.5
Memorandum items:					
Adjusted budgetary expenditure					
Inflation adjustment to indexed bonds 5/					
Net expenditure on direct PIDIREGAS projects 6/					

Sources: Secretariat of Finance and Public Credit; and Fund staff estimates.

1/ Cash basis; GFS definition.
2/ Excludes cash transfers to IPAB/FOBAPROA for bank restructuring and debtor support.
3/ Includes physical and financial investment. Excludes transfers to Oil Stabilization Fund in 2000.
4/ In 1996 corrected for Mex$8.4 billion (0.3 percent of GDP) in oil-related revenue that was received in 1996, but which, under the national definition, were recorded as both revenue and expenditure.
5/ Inflation adjustment on the principal of indexed government securities (Udibonos, Ajustabonos, and SAR).
6/ Executed direct public investment PIDIREGAS projects (net of budgetary transfers).

Table 14. Mexico: Interest Paid by the Consolidated Nonfinancial Public Sector

	1996	1997	1998	1999	Prel. 2000
	(In millions of Mexican pesos)				
Total interest	**90,806**	**90,806**	**101,643**	**141,141**	**168,844**
Domestic 1/	38,421	41,219	47,630	77,936	95,753
External	52,384	49,587	54,013	63,205	73,091
Budgetary sector	**90,463**	**90,401**	**101,157**	**140,554**	**168,126**
Domestic 1/	38,203	40,965	47,305	77,523	95,178
External	52,260	49,436	53,852	63,031	72,948
Federal government	74,285	74,438	85,604	121,042	143,544
Domestic 1/	29,231	33,292	41,311	70,669	88,117
External	45,054	41,146	44,293	50,373	55,428
Social security and state enterprises	16,177	15,963	15,553	19,512	24,582
Domestic	8,972	7,673	5,994	6,853	7,061
External	7,205	8,290	9,559	12,659	17,521
Extrabudgetary sector	343	405	486	587	718
Domestic	219	254	325	413	575
External	124	150	161	174	142
Memorandum items:					
Adjusted interest payments	**197,450**	**226,818**	**274,479**	**357,497**	**331,273**
Inflation adjustment to indexed bonds 2/	15,236	11,909	18,266	13,803	12,650
Imputed interest on bank restructuring and debtor support 3/	71,409	84,317	144,463	178,761	115,748
Budgetary transfers to IPAB/FOBAPROA	20,000	39,786	10,107	23,792	34,031
Total interest (national definition) 4/	110,806	130,592	111,750	164,933	202,875
	(In percent of GDP)				
Total interest	**3.6**	**2.9**	**2.6**	**3.1**	**3.1**
Domestic 1/	1.5	1.3	1.2	1.7	1.8
External	2.1	1.6	1.4	1.4	1.3
Budgetary sector	**3.6**	**2.8**	**2.6**	**3.1**	**3.1**
Domestic 1/	1.5	1.3	1.2	1.7	1.8
External	2.1	1.6	1.4	1.4	1.3
Federal government	2.9	2.3	2.2	2.6	2.6
Domestic 1/	1.2	1.0	1.1	1.5	1.6
External	1.8	1.3	1.2	1.1	1.0
Social security and state enterprises	0.6	0.5	0.4	0.4	0.5
Domestic	0.4	0.2	0.2	0.1	0.1
External	0.3	0.3	0.2	0.3	0.3
Extrabudgetary sector	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Domestic	0.0	0.0	0.0	0.0	0.0
External	0.0	0.0	0.0	0.0	0.0
Memorandum items:					
Adjusted interest payments	**7.8**	**7.1**	**7.1**	**7.8**	**6.1**
Inflation adjustment to indexed bonds 2/	0.6	0.4	0.5	0.3	0.2
Imputed interest on bank restructuring and debtor support 3/	2.8	2.7	3.8	3.9	2.1
Budgetary transfers to IPAB/FOBAPROA	0.8	1.3	0.3	0.5	0.6
Total interest (national definition) 4/	4.4	4.1	2.9	3.6	3.7

Source: Secretariat of Finance and Public Credit.

1/ Only includes real interest for indexed government debt. Excludes transfers to IPAB/FOBAPROA, which, under the national definition, are treated as interest expenditures.

2/ Inflation adjustment on the principal of indexed government securities (Udibonos, Ajustabonos, and SAR).

3/ Includes imputed interest on PIDIREGAS and FARAC liabilities, net of budgetary transfers.

4/ Includes transfers to IPAB/FOBAPROA as interest expenditures.

Table 15. Mexico: Financing of the Nonfinancial Public Sector 1/

	1996	1997	1998	1999	Prel. 2000
Total	**-8,683**	**31,411**	**47,919**	**51,988**	**51,367**
Foreign financing	-6,855	-26,967	19,201	8,097	-57,485
Domestic financing	-1,828	58,378	28,718	43,891	108,852
Bank of Mexico	-15,255	-40,842	-2,006	-98,060	-63,494
Government securities	25,165	80,051	119,569	-22,310	45,025
Banking system	-3,337	10,769	-88,846	164,261	136,454
Other 2/	-8,400	8,400	0	0	-9,133
Total	**-0.3**	**1.0**	**1.2**	**1.1**	**0.9**
Foreign financing	-0.3	-0.8	0.5	0.2	-1.1
Domestic financing	-0.1	1.8	0.7	1.0	2.0
Bank of Mexico	-0.6	-1.3	-0.1	-2.1	-1.2
Government securities	1.0	2.5	3.1	-0.5	0.8
Banking system	-0.1	0.3	-2.3	3.6	2.5
Other 2/	-0.3	0.3	0.0	0.0	-0.2

Source: Secretariat of Finance and Public Credit.

1/ Refers to financing under traditional budget presentation.

2/ In 1996 includes adjustment to PEMEX accounts for Mex$8.4 billion, but which, under the national definition were recorded as revenue in 1997. In 2000, includes contributions to Oil Stabilization Fund.

Table 16. Mexico: Summary Financial Operations of the Federal Government

	1996	1997	1998	1999	Prel. 2000
	(In millions of Mexican pesos)				
Total revenue 1/	**392,566**	**503,554**	**545,176**	**674,348**	**866,231**
Tax revenue	226,006	312,115	404,225	522,236	578,991
Nontax revenue 2/	166,560	191,439	140,951	152,666	287,241
Total expenditure	**403,083**	**543,759**	**610,332**	**761,234**	**936,738**
Current expenditure	350,650	475,889	538,956	684,760	843,641
Capital expenditure 3/	46,908	60,389	63,115	69,984	83,489
Net deferred expenditure	5,524	7,481	8,261	6,490	9,607
Budgetary balance	-10,517	-40,205	-65,156	-86,886	-70,507
Change in third party accounts	-962	-2,967	-2,144	6,846	-4,176
Overall balance	**-11,479**	**-43,172**	**-67,300**	**-80,041**	**-74,682**
Financing (net)	**11,479**	**43,172**	**67,300**	**80,041**	**74,682**
External	-37,155	-37,020	...	...	...
Domestic	48,634	80,192	...	...	...
	(In percent of GDP)				
Total revenue 1/	**15.5**	**15.9**	**14.2**	**14.7**	**15.9**
Tax revenue	8.9	9.8	10.5	11.4	10.7
Nontax revenue 2/	6.6	6.0	3.7	3.3	5.3
Total expenditure	**16.0**	**17.1**	**15.9**	**16.6**	**17.2**
Current expenditure	13.9	15.0	14.0	14.9	15.5
Capital expenditure 3/	1.9	1.9	1.6	1.5	1.5
Net deferred expenditure	0.2	0.2	0.2	0.1	0.2
Budgetary balance	**-0.4**	**-1.3**	**-1.7**	**-1.9**	**-1.3**
Change in third party accounts	0.0	-0.1	-0.1	0.1	-0.1
Overall balance	**-0.5**	**-1.4**	**-1.8**	**-1.7**	**-1.4**
Financing (net)	**0.5**	**1.4**	**1.8**	**1.7**	**1.4**
External	-1.5	-1.2	...	...	...
Domestic	1.9	2.5	...	...	...

Source: Secretariat of Finance and Public Credit.

1/ Excludes proceeds from privatization of Telmex and commercial banks (extraordinary privatization proceeds); all other privatization proceeds are included.

2/ Includes hydrocarbon royalties which in the consolidated nonfinancial public sector accounts are treated as PEMEX revenue.

3/ Includes physical and financial investment. Excludes transfers to Oil Stabilization Fund in 2000.

Table 17. Mexico: Budgetary Revenue of the Federal Government

	1996	1997	1998	1999	Prel. 2000
	(In millions of Mexican pesos)				
Total 1/	**392,566**	**503,554**	**545,176**	**674,902**	**866,231**
Tax revenue	226,006	312,115	404,225	522,236	578,991
Income taxes 2/	97,162	135,101	169,476	216,123	254,133
VAT	72,110	97,742	119,871	151,184	190,730
Excises	29,695	45,351	76,598	106,704	82,042
Oil derivatives	20,412	34,384	61,621	87,461	66,705
Other	9,283	10,967	14,977	19,243	15,336
Tobacco	3,972	4,371	4,990	6,181	8,042
Alcohol	1,667	2,802	4,046	5,454	-1,873
Beer	3,643	3,794	5,941	7,608	9,167
Other	0	0	0	0	0
Payroll taxes	0	0	0	0	0
Import duties	14,855	18,103	21,488	27,857	33,341
Fiscal fines	0	0	0	0	0
Other taxes	12,185	15,819	16,791	20,369	18,745
Nontax revenue	166,560	191,439	140,951	152,666	287,241
Royalties	113,465	132,092	105,005	106,373	211,632
Hydrocarbons 3/	106,270	122,739	88,778	90,465	196,423
Other	7,195	9,352	16,227	15,908	15,209
Products	7,147	8,443	12,013	7,854	7,475
Dividends, enterprise sales, and others	45,948	50,905	23,932	38,438	68,134
Of which: privatization, BOM, and debt buyback profits	28,891	23,187	12,932	19,037	20,999
	(In percent of GDP)				
Total 1/	**15.5**	**15.9**	**14.2**	**14.7**	**15.9**
Tax revenue	8.9	9.8	10.5	11.4	10.7
Income taxes 2/	3.8	4.3	4.4	4.7	4.7
VAT	2.9	3.1	3.1	3.3	3.5
Excises	1.2	1.4	2.0	2.3	1.5
Oil derivatives	0.8	1.1	1.6	1.9	1.2
Other	0.4	0.3	0.4	0.4	0.3
Tobacco	0.2	0.1	0.1	0.1	0.1
Alcohol	0.1	0.1	0.1	0.1	0.0
Beer	0.1	0.1	0.2	0.2	0.2
Other	0.0	0.0	0.0	0.0	0.0
Payroll taxes	0.0	0.0	0.0	0.0	0.0
Import duties	0.6	0.6	0.6	0.6	0.6
Fiscal fines	0.0	0.0	0.0	0.0	0.0
Other taxes	0.5	0.5	0.4	0.4	0.3
Nontax revenue	6.6	6.0	3.7	3.3	5.3
Royalties	4.5	4.2	2.7	2.3	3.9
Hydrocarbons 3/	4.2	3.9	2.3	2.0	3.6
Other	0.3	0.3	0.4	0.3	0.3
Products	0.3	0.3	0.3	0.2	0.1
Dividends, enterprise sales, and others	1.8	1.6	0.6	0.8	1.3
Of which: privatization, BOM, and debt buyback profits	1.1	0.7	0.3	0.4	0.4

Source: Secretariat of Finance and Public Credit.

1/ Excludes proceeds from privatization of Telmex and commercial banks (extraordinary privatization proceeds); all other privatization proceeds are included.

2/ Includes income tax on physical and juridical persons, the tax on gross assets, and (since 1992) the telephone tax, which previously was classified as an excise tax.

3/ In the accounts for the consolidated nonfinancial public sector these hydrocarbon receipts are treated as revenue of PEMEX (domestic) rather than of the federal government.

Table 18. Mexico: Economic Classification of Federal Government Expenditure

	1996	1997	1998	1999	Prel. 2000
	(In millions of Mexican pesos)				
Total	**403,083**	**543,759**	**610,323**	**761,234**	**936,738**
Programmable expenditure	232,373	327,481	392,686	469,240	571,453
Current expenditure	185,464	267,092	329,580	399,255	487,963
Consumption	64,349	68,951	74,881	87,461	104,177
Personal services	44,789	45,123	56,084	67,536	81,370
Goods and supplies	5,008	5,442	5,852	6,198	6,614
Nonpersonal services	13,112	15,562	12,410	13,726	15,778
Other expenditure	1,440	2,824	536	0	416
Transfers	121,115	198,141	254,698	311,795	383,786
Capital expenditure	46,908	60,389	63,106	69,984	83,489
Multiperiod goods	3,285	3,531	3,369	6,155	5,295
Public works	18,724	25,214	13,279	14,192	12,488
Transfers	23,336	29,115	46,334	49,541	65,614
Financial investment 1/	1,562	2,528	123	96	93
Nonprogrammable expenditure	170,710	216,279	217,637	291,995	365,286
Interest and fees	74,285	74,438	85,604	121,042	143,544
Domestic 2/	29,231	33,292	41,311	70,669	88,117
External	45,054	41,146	44,293	50,373	55,428
Revenue sharing	70,901	94,573	113,665	140,671	178,103
Cash transfers to banks and debtors	20,000	39,786	10,107	23,792	34,031
Net deferred expenditure	5,524	7,481	8,261	6,490	9,607
Current	4,511	5,858	6,326	4,889	8,328
Capital	1,013	1,623	1,935	1,601	1,280
Memorandum items:					
Adjusted budgetary expenditure	**419,812**	**561,337**	**663,209**	**821,060**	**997,640**
Inflation adjustment to indexed bonds 3/	15,236	11,909	18,266	13,803	12,650
Net expenditure on direct PIDIREGAS projects 4/	1,493	5,668	34,620	46,022	48,252
National defense expenditure	10,559	12,624	14,770	18,355	19,702
	(In percent of GDP)				
Total	**16.0**	**17.1**	**15.9**	**16.6**	**17.2**
Programmable expenditure	9.2	10.3	10.2	10.2	10.5
Current expenditure	7.3	8.4	8.6	8.7	9.0
Consumption	2.5	2.2	1.9	1.9	1.9
Personal services	1.8	1.4	1.5	1.5	1.5
Goods and supplies	0.2	0.2	0.2	0.1	0.1
Nonpersonal services	0.5	0.5	0.3	0.3	0.3
Other expenditure	0.1	0.1	0.0	0.0	0.0
Transfers	4.8	6.2	6.6	6.8	7.1
Capital expenditure	1.9	1.9	1.6	1.5	1.5
Multiperiod goods	0.1	0.1	0.1	0.1	0.1
Public works	0.7	0.8	0.3	0.3	0.2
Transfers	0.9	0.9	1.2	1.1	1.2
Financial investment 1/	0.1	0.1	0.0	0.0	0.0
Nonprogrammable expenditure	6.8	6.8	5.7	6.4	6.7
Interest and fees	2.9	2.3	2.2	2.6	2.6
Domestic 2/	1.2	1.0	1.1	1.5	1.6
External	1.8	1.3	1.2	1.1	1.0
Revenue sharing	2.8	3.0	3.0	3.1	3.3
Cash transfer to banks and debtors	0.8	1.3	0.3	0.5	0.6
Net deferred expenditure	0.2	0.2	0.2	0.1	0.2
Current	0.2	0.2	0.2	0.1	0.2
Capital	0.0	0.1	0.1	0.0	0.0
Memorandum items:					
Adjusted budgetary expenditure	**16.6**	**17.7**	**17.2**	**17.9**	**18.4**
Inflation adjustment to indexed bonds 3/	0.6	0.4	0.5	0.3	0.2
Net expenditure on direct PIDIREGAS projects 4/	0.1	0.2	0.9	1.0	0.9
National defense expenditure	0.4	0.4	0.4	0.4	0.4

Source: Secretariat of Finance and Public Credit.

1/ Excludes transfers to Oil Stabilization Fund in 2000.

2/ Excludes transfers to IPAB/FOBAPROA.

3/ Inflation adjustment on the principal of indexed government securities (Udibonos, Ajustabonos, and SAR).

4/ Executed direct public investment PIDIREGAS projects (net of budgetary transfers).

Table 19. Mexico: Consolidated Cash Flow of the Parastatal Sector Excluding PEMEX

	1996	1997	1998	1999	Prel. 2000
	(In millions of Mexican pesos)				
Current revenue	**121,472**	**151,285**	**168,304**	**193,735**	**227,213**
Sale of goods and services	61,427	80,199	90,255	95,184	113,050
Domestic	60,983	80,078	89,907	95,146	112,983
External	444	120	348	38	67
Other 1/	60,045	71,086	78,049	98,551	114,163
Operating expenditure	**117,900**	**161,327**	**175,082**	**203,595**	**247,688**
Wages and salaries	42,375	69,288	63,090	79,548	88,145
Goods and services	33,307	41,698	48,763	46,319	67,932
Interest	2,868	2,765	2,928	4,998	5,445
Other	39,351	47,576	60,301	72,730	86,166
Operating balance	**3,572**	**-10,042**	**-6,779**	**-9,860**	**-20,475**
Current transfers	**19,387**	**49,478**	**56,562**	**65,136**	**78,284**
Tax payments	**2,966**	**3,518**	**4,222**	**4,208**	**4,762**
Direct taxes	1,126	1,591	1,771	2,167	2,695
Others	1,840	1,927	2,451	2,041	2,067
Current balance	**19,993**	**35,917**	**45,562**	**51,068**	**53,046**
Capital revenue	0	0	0	0	0
Capital transfers	5,216	3,330	214	200	0
Capital expenditure	18,184	22,417	23,633	29,142	30,406
Net expenditure on behalf of others	223	884	-533	-698	-2,454
Overall balance	**7,248**	**17,714**	**21,609**	**21,429**	**20,186**
Financing (net)	**-7,248**	**-17,714**	**-21,609**	**-21,429**	**-20,186**
Borrowing (net)	192	-3,328	-3,632	-2,170	-4,531
Domestic	597	-333	-1,588	-1,102	-1,161
External	-404	-2,995	-2,044	-1,068	-3,370
Change in deposits	-7,440	-14,387	-17,977	-19,258	-15,655
	(In percent of GDP)				
Current revenue	**4.8**	**4.8**	**4.4**	**4.2**	**4.2**
Sale of goods and services	2.4	2.5	2.3	2.1	2.1
Domestic	2.4	2.5	2.3	2.1	2.1
External	0.0	0.0	0.0	0.0	0.0
Other 1/	2.4	2.2	2.0	2.1	2.1
Operating expenditure	**4.7**	**5.1**	**4.6**	**4.4**	**4.6**
Wages and salaries	1.7	2.2	1.6	1.7	1.6
Goods and services	1.3	1.3	1.3	1.0	1.3
Interest	0.1	0.1	0.1	0.1	0.1
Other	1.6	1.5	1.6	1.6	1.6
Operating balance	**0.1**	**-0.3**	**-0.2**	**-0.2**	**-0.4**
Current transfers	**0.8**	**1.6**	**1.5**	**1.4**	**1.4**
Tax payments	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Current balance	**0.8**	**1.1**	**1.2**	**1.1**	**1.0**
Overall balance	**0.3**	**0.6**	**0.6**	**0.5**	**0.4**
Financing (net)	**-0.3**	**-0.6**	**-0.6**	**-0.5**	**-0.4**
Borrowing (net)	0.0	-0.1	-0.1	0.0	-0.1
Change in deposits	-0.3	-0.5	-0.5	-0.4	-0.3

Source: Secretariat of Finance and Public Credit.

1/ Includes social security contributions.

Table 20. Mexico: Cash Flow of Petroleos Mexicanos (PEMEX)

	1996	1997	1998	1999	Prel. 2000
	(In millions of Mexican pesos)				
Current revenue	**188,532**	**207,970**	**173,673**	**201,696**	**321,494**
Sale of goods and services	181,695	198,168	166,563	194,858	317,560
Domestic	107,925	127,069	120,564	131,788	214,523
External	73,770	71,098	45,999	63,070	103,037
Other	6,837	9,803	7,109	6,838	3,934
Operating expenditure	**38,772**	**49,541**	**52,206**	**66,604**	**72,853**
Wages and salaries	7,477	10,457	22,138	34,949	30,551
Goods and services	3,698	4,954	5,397	4,280	5,798
Interest	13,310	13,198	12,625	14,514	19,137
Other	14,288	20,931	12,047	12,861	17,367
Operating balance	**149,760**	**158,429**	**121,466**	**135,093**	**248,641**
Current transfers	**0**	**0**	**0**	**0**	**0**
Tax payments	**115,179**	**131,339**	**91,799**	**99,631**	**220,454**
Direct taxes	0	0	0	0	0
Others	115,179	131,339	91,799	99,631	220,454
Current balance	**34,581**	**27,090**	**29,667**	**35,461**	**28,187**
Capital revenue	0	0	0	0	0
Capital transfers	0	0	0	0	0
Capital expenditure 1/	23,638	28,794	31,043	25,136	31,587
Net expenditure on behalf of others	-1,573	-772	-497	-4,564	5,804
Overall balance	**9,371**	**-2,476**	**-1,873**	**5,761**	**2,404**
Financing (net)	**-9,371**	**2,476**	**1,873**	**-5,761**	**-2,404**
Borrowing (net)	4,720	-8,964	1,086	2,401	-5,331
Domestic	-5,830	-9,504	-2,447	-1,291	-2,824
External	10,550	540	3,534	3,692	-2,507
Change in deposits	-14,091	11,440	787	-8,162	2,927
	(In percent of GDP)				
Current revenue	**7.5**	**6.6**	**4.5**	**4.4**	**5.9**
Sale of goods and services	7.2	6.2	4.3	4.2	5.8
Domestic	4.3	4.0	3.1	2.9	3.9
External	2.9	2.2	1.2	1.4	1.9
Other	0.3	0.3	0.2	0.1	0.1
Operating expenditure	**1.5**	**1.6**	**1.4**	**1.5**	**1.3**
Wages and salaries	0.3	0.3	0.6	0.8	0.6
Goods and services	0.1	0.2	0.1	0.1	0.1
Interest	0.5	0.4	0.3	0.3	0.4
Other	0.6	0.7	0.3	0.3	0.3
Operating balance	**5.9**	**5.0**	**3.2**	**2.9**	**4.6**
Tax payments	**4.6**	**4.1**	**2.4**	**2.2**	**4.1**
Current balance	**1.4**	**0.9**	**0.8**	**0.8**	**0.5**
Overall balance	**0.4**	**-0.1**	**0.0**	**0.1**	**0.0**
Financing (net)	**-0.4**	**0.1**	**0.0**	**-0.1**	**0.0**
Borrowing (net)	0.2	-0.3	0.0	0.1	-0.1
Domestic	-0.2	-0.3	-0.1	0.0	-0.1
External	0.4	0.0	0.1	0.1	0.0
Change in deposits	-0.6	0.4	0.0	-0.2	0.1

Source: Secretariat of Finance and Public Credit.

1/ In 1996 corrected for Mex$8.4 billion (0.3 percent of GDP) in oil-related revenue that was received in 1996, but which, under the national definition, were recorded as both revenue and expenditure.

Table 21. Mexico: Consolidated Cash Flow of the Noncontrolled Parastatal Sector

	1996	1997	1998	1999	Prel. 2000
	(In millions of Mexican pesos)				
Current revenue	**21,886**	**29,000**	**33,971**	**39,129**	**44,038**
Sale of goods and services	17,634	24,442	28,859	33,618	36,502
Domestic	16,582	20,533	24,223	28,626	30,672
External	1,052	3,908	4,637	4,992	5,830
Other	4,253	4,558	5,112	5,511	7,536
Operating expenditure	**33,225**	**43,405**	**50,699**	**56,100**	**63,847**
Wages and salaries	9,391	12,437	15,906	19,659	21,612
Goods and services	13,176	16,813	17,567	16,206	17,939
Interest	343	405	486	587	718
Other	10,316	13,750	16,741	19,647	23,579
Operating balance	**-11,339**	**-14,405**	**-16,728**	**-16,971**	**-19,809**
Current transfers	**15,880**	**18,859**	**22,456**	**25,430**	**28,887**
Tax payments	**755**	**1,032**	**1,319**	**2,041**	**3,206**
Current balance	**3,786**	**3,422**	**4,409**	**6,418**	**5,873**
Capital revenue	11	180	10	1	0
Capital transfers	5,995	6,252	5,554	4,394	5,474
Capital expenditure	7,599	9,301	8,599	7,351	7,763
Net expenditure on behalf of others	-176	-176	107	-434	-1,879
Overall balance	**2,017**	**377**	**1,481**	**3,028**	**1,705**
Financing (net)	**-2,017**	**-377**	**-1,481**	**-3,028**	**-1,705**
Borrowing (net)	201	96	27	36	-2
Domestic	42	-71	-84	-8	-4
External	159	167	111	44	3
Change in deposits	-2,219	-473	-1,508	-3,064	-1,703
	(In percent of GDP)				
Current revenue	**0.9**	**0.9**	**0.9**	**0.9**	**0.8**
Sale of goods and services	0.7	0.8	0.8	0.7	0.7
Domestic	0.7	0.6	0.6	0.6	0.6
External	0.0	0.1	0.1	0.1	0.1
Other	0.2	0.1	0.1	0.1	0.1
Operating expenditure	**1.3**	**1.4**	**1.3**	**1.2**	**1.2**
Wages and salaries	0.4	0.4	0.4	0.4	0.4
Goods and services	0.5	0.5	0.5	0.4	0.3
Interest	0.0	0.0	0.0	0.0	0.0
Other	0.4	0.4	0.4	0.4	0.4
Operating balance	**-0.4**	**-0.5**	**-0.4**	**-0.4**	**-0.4**
Current transfers	**0.6**	**0.6**	**0.6**	**0.6**	**0.5**
Current balance	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Overall balance	**0.1**	**0.0**	**0.0**	**0.1**	**0.0**
Financing (net)	**-0.1**	**0.0**	**0.0**	**-0.1**	**0.0**
Borrowing (net)	0.0	0.0	0.0	0.0	0.0
Change in deposits	-0.1	0.0	0.0	-0.1	0.0

Source: Secretariat of Finance and Public Credit.

Table 22. Mexico: Summary Accounts of the Monetary Survey 1/

	1996	1997	1998	1999	2000
	(In billions of Mexican pesos)				
Net foreign assets	**72,327**	**194,588**	**302,648**	**333,742**	**439,992**
Foreign assets	240,539	279,412	396,980	386,996	455,083
Foreign liabilities	168,212	84,824	94,332	53,254	15,091
Net domestic credit	**1,066,224**	**1,104,136**	**1,290,107**	**1,388,156**	**1,341,186**
Net credit to federal government 2/	170,286	101,723	124,457	42,747	-36,282
In domestic currency	22,549	8,940	-5,243	-29,629	-52,030
In foreign currency	137,248	127,203	149,371	166,146	156,678
Net credit to other nonfinancial public sector	-6,466	17,323	18,706	-1,241	2,974
In domestic currency	-752	9,898	85	-6,457	-8,452
In foreign currency	-6,736	4,969	5,245	1,968	3,782
Net credit to FOBAPROA/IPAB	11,045	180,219	226,662	409,997	429,393
Net credit to other nonbank financial public sector 3/	-44,741	-105,997	-115,208	-155,927	-195,257
Credit to private sector	550,618	647,565	746,428	749,044	733,676
In domestic currency	358,683	487,581	551,516	573,491	576,794
In foreign currency	191,935	159,984	194,912	175,553	156,882
Net unclassified assets 4/	385,484	263,303	289,061	343,536	406,680
Other foreign liabilities	**337,503**	**279,447**	**328,976**	**288,647**	**277,257**
Medium- and long-term liabilities	337,503	279,447	328,976	288,647	277,257
M2	**801,049**	**1,019,278**	**1,263,779**	**1,433,251**	**1,503,920**
In domestic currency	733,951	980,425	1,212,500	1,371,371	1,431,012
Currency in circulation	74,091	94,197	116,099	164,198	182,058
Demand deposits	125,789	169,060	187,654	226,416	254,534
Savings deposits	1,928	592,491	701,892	733,329	645,458
Time deposits and other obligations	532,143	124,678	206,854	247,428	348,962
In foreign currency	67,096	38,853	51,279	61,880	72,908
	(In percent of GDP, unless otherwise indicated)				
Memorandum items:					
Exchange rate (Mex$ per US$) 5/	7.9	8.1	9.9	9.5	9.6
Net foreign assets	2.9	6.1	7.9	7.3	8.1
Net domestic credit	42.1	34.7	33.5	30.3	24.7
Of which					
Credit to the private sector	21.8	20.4	19.4	16.3	13.5
Adjusted credit to the private sector 6/	35.7	36.0	35.2	30.1	23.7
Other foreign liabilities	13.3	8.8	8.5	6.3	5.1
M2	31.7	32.1	32.8	31.2	27.7

Source: Bank of Mexico.

1/ From January 1997 onwards, monetary aggregates are based on resident financial institutions only.
2/ Includes net holdings of government securities by the Bank of Mexico.
3/ Excludes liabilities to official trust funds of the Bank of Mexico.
4/ Includes valuation adjustment to Fund transactions, gold price adjustment, capital and surplus, SDR holdings, repurchase operations, assets restructured into UDI (cetes especialcs), and statistical discrepancies.
5/ End of period.
6/ Including assets sold to FOBAPROA and assets restructured into UDI (cetes especiales).

Table 23. Mexico: Monetary Aggregates 1/

	1996	1997	1998	1999	2000
(Annual percent change, unless otherwise indicated)					
Monetary base	25.7	29.6	20.8	43.5	10.7
M1a 2/	43.0	32.5	19.8	26.3	15.7
Currency in circulation	22.2	27.1	23.1	41.6	10.9
Checking accounts	-25.5	-31.2	-7.8	-23.1	-5.0
Debit accounts	10.7	8.3	3.4	5.7	-0.5
M2 3/					
M2a 4/	35.7	33.3	26.0	21.3	13.2
Of which					
Bank time deposits	26.5	16.8	26.1	4.8	-13.4
Securities issued by federal government	54.7	90.4	42.0	60.8	30.2
Real monetary base	-1.6	12.0	1.8	27.8	1.6
Real M1a	11.9	14.5	1.0	12.5	6.2
Currency in circulation	-4.3	9.9	3.8	26.1	1.8
Checking accounts	18.9	13.5	-1.8	7.0	5.5
Debit accounts	35.9	40.2	10.8	6.0	24.9
Real M2					
Real M2a	6.2	15.2	6.2	8.0	3.9
Of which					
Bank time deposits	-0.9	0.9	6.3	-6.7	-20.5
Securities issued by federal government	21.1	64.5	19.7	43.2	19.5
Monetary base velocity	145.4	81.5	-32.2	144.0	14.2
M1a velocity	-3.8	-5.2	1.1	-5.6	2.4
M2 velocity	5.7	5.5	-0.4	2.1	21.3
M2a velocity	1.3	-5.8	-3.9	-1.7	4.6
Memorandum items:					
M3a 5/	34.4	32.4	25.2	21.0	13.4
M4a 6/	31.8	29.0	24.2	19.4	12.3
(In percent of GDP, unless otherwise indicated)					
Monetary base	3.3	3.4	3.4	4.1	3.8
M1a	9.9	10.4	10.3	10.9	10.7
M2	31.7	30.0	30.2	29.6	24.4
M2a	42.0	44.5	46.4	47.2	45.1
M3a	43.2	45.5	47.1	47.8	45.8
M4a	46.8	48.0	49.3	49.4	46.8
Nominal short-term interest rate (percent) 7/	27.3	18.8	31.2	16.3	17.6
Real short-term interest rate (percent) 7/	-10.8	2.0	4.3	4.4	4.0

Sources: Bank of Mexico; and Fund staff estimates.

1/ The methodology for computing monetary aggregates was changed in August 1999. For new composition of aggregates, see footnote 2 and 4–6.
2/ Currency plus financial savings in highly liquid assets by resident private and public sector entities.
3/ Fund definition.
4/ M1a + financial savings by resident private and public sector entities in other internal assets.
5/ M2a + non-resident holdings of financial assets.
6/ M3a + financial liabilities of non-resident Mexican banks.
7/ End period, 28-day treasury bills.

Table 24. Mexico: Summary Accounts of the Bank of Mexico 1/

	1996	1997	1998	1999	2000
	(In millions of Mexican pesos)				
Net foreign assets	**51,933**	**161,635**	**235,215**	**264,206**	**347,354**
Foreign assets	160,775	239,513	323,623	310,248	349,551
Foreign liabilities	108,842	77,878	88,408	46,042	2,197
Net domestic assets	**32,072**	**-52,499**	**-103,687**	**-75,440**	**-138,411**
Net credit to federal government	-16,395	-47,910	-75,334	-92,170	-133,421
In domestic currency	-15,361	-45,454	-61,958	-88,922	-125,777
In foreign currency	-1,034	-2,456	-13,376	-3,249	-7,644
Net credit to other public sector	-14,849	-4,766	-3,721	-7,222	-13,147
In domestic currency	-1,034	-2,456	-13,376	-3,249	-7,644
In foreign currency	-14,838	-4,766	-3,721	-7,222	-13,147
Net credit to FOBAPROA/IPAB	11,045	18,822	39,103	54,064	69,717
Net credit to other official trust funds	40,516	41,056	27,311	29,976	22,746
Net credit to commercial banks	-1,696	-36,460	-58,798	10,495	43,382
Net credit to government development banks	-2,914	-2,882	-1,487	-1,718	3,458
Net holdings of government securities	10,489	-34,420	-19,672	-93,771	-140,930
Net unclassified assets	5,878	14,061	-11,090	24,905	9,784
Monetary base	**84,005**	**109,136**	**131,528**	**188,766**	**208,943**
Currency in circulation	74,091	94,197	116,099	164,198	182,058
Banks' reserves in vault	9,900	14,539	15,009	24,520	26,822
Banks' reserves at the Bank of Mexico	14	401	419	48	63
	(In percent of GDP, unless otherwise indicated)				
Memorandum items:					
Exchange rate (Mex$ per US$) 2/	7.9	8.1	9.9	9.5	9.6
Net foreign assets	2.1	5.1	6.1	5.8	6.4
Net domestic assets	1.3	-1.7	-2.7	-1.6	-2.5
Monetary base	3.3	3.4	3.4	4.1	3.8
Currency in circulation	2.9	3.0	3.0	3.6	3.4

Source: Bank of Mexico.

1/ Includes valuation adjustment to Fund transactions, gold price adjustment, capital and surplus, SDR holdings, and statistical discrepancies.

2/ End of period.

Table 25. Mexico: Summary Accounts of the Commercial Banks 1/

	1996	1997	1998	1999	2000
	(In millions of Mexican pesos)				
Net foreign assets	**-10,979**	**16,176**	**41,789**	**48,816**	**65,017**
Foreign assets	48,297	21,395	46,238	54,561	77,475
Foreign liabilities	59,276	5,219	4,449	5,745	12,458
Net claims on Bank of Mexico	**1,335**	**49,258**	**70,406**	**18,183**	**-13,374**
In domestic currency	1,335	48,245	70,477	18,114	-13,420
In foreign currency	0	1,013	-71	69	47
Net domestic credit	**719,500**	**859,974**	**1,023,508**	**1,151,155**	**1,206,163**
Net credit to federal government	11,393	37,076	40,999	45,262	-23,630
In domestic currency	6,693	36,696	40,907	44,884	-23,628
In foreign currency	4,700	380	92	378	-2
Net credit to other nonfinancial public sector	2,025	4,962	7,298	2,878	5,808
In domestic currency	261	3,530	5,691	1,756	2,280
In foreign currency	1,765	1,433	1,607	1,122	3,528
Net credit to FOBAPROA/IPAB	...	153,849	178,647	355,933	352,305
Net credit to other nonbank financial public sector 2/	-81,238	-140,211	-146,682	-181,019	-142,889
Net credit to government development banks	-41,703	-35,989	-44,745	-22,204	-38,102
Credit to private sector	462,241	569,258	672,385	667,422	640,098
In domestic currency	301,486	429,256	502,143	516,917	514,346
In foreign currency	160,755	140,003	170,241	150,504	125,752
Net unclassified assets 3/	366,782	424,877	494,253	638,816	764,878
Other foreign liabilities	**81,544**	**50,993**	**49,431**	**33,656**	**22,343**
Medium- and long-term liabilities	81,544	50,993	49,431	33,656	22,343
Liabilities to the private sector	**628,312**	**874,415**	**1,086,272**	**1,184,498**	**1,236,308**
In domestic currency	562,596	840,871	1,042,984	1,130,353	1,175,236
Demand deposits	122,693	165,753	184,483	222,921	251,048
Saving deposits	1,583	557,216	668,597	689,150	606,360
Time deposits and obligations	438,320	117,902	189,904	218,282	317,828
In foreign currency	65,715	33,544	43,288	54,145	61,072
	(In percent of GDP, unless otherwise indicated)				
Memorandum items:					
Exchange rate (Mex$ per US$) 4/	7.9	8.1	9.9	9.5	9.6
Net foreign assets	-0.4	0.5	1.1	1.1	1.2
Net claims on Bank of Mexico	0.1	1.5	1.8	0.4	-0.2
Net domestic credit	28.4	27.1	26.6	25.1	22.2
Of which					
Credit to the private sector	18.3	17.9	17.5	14.5	11.8
Adjusted credit to the private sector 5/	32.2	33.0	32.8	27.9	21.6
Other foreign liabilities	3.2	1.6	1.3	0.7	0.4
Liabilities to the private sector	24.8	27.5	28.2	25.8	22.8

Source: Bank of Mexico.

1/ From January 1997 onwards, monetary aggregates are based on resident financial institutions only.
2/ Excludes liabilities to official trust funds of the Bank of Mexico.
3/ Includes other assets, statistical discrepancies, interbank float, repurchase operations, assets restructured into UDI (cetes especiales), and capital and surplus.
4/ End of period.
5/ Including assets sold to FOBAPROA and assets restructured into UDI (cetes especiales).

Table 26. Mexico: Summary Accounts of the Government Development Banks 1/

	1996	1997	1998	1999	2000
	(In millions of Mexican pesos)				
Net foreign assets	**31,373**	**16,777**	**25,644**	**20,720**	**27,621**
Foreign assets	31,467	18,504	27,119	22,186	28,057
Foreign liabilities	94	1,727	1,475	1,466	436
Net claims on Bank of Mexico	**2,860**	**-3,817**	**-4,696**	**-4,687**	**-6,576**
In domestic currency	14	-2,099	-2,843	-3,145	-5,271
In foreign currency	2,846	-1,719	-1,853	-1,542	-1,305
Net domestic credit	**320,372**	**266,160**	**320,004**	**323,513**	**319,423**
Net credit to federal government	164,799	146,977	178,463	183,426	261,699
In domestic currency	31,217	17,699	15,808	14,409	97,375
In foreign currency	133,582	129,279	162,655	169,016	164,324
Net credit to other nonfinancial public sector	6,358	17,126	15,129	3,103	10,313
In domestic currency	21	8,824	7,770	-4,965	-3,088
In foreign currency	6,337	8,302	7,358	8,068	13,401
Net credit to FOBAPROA/IPAB	...	7,548	8,912	0	7,371
Net credit to other nonbank financial public sector 2/	-4,019	-6,841	4,163	-4,884	-75,113
Net credit to commercial banks	67,080	41,268	40,931	60,460	28,051
Credit to private sector	88,377	78,307	74,043	81,622	93,578
In domestic currency	57,197	58,326	49,373	56,573	62,448
In foreign currency	31,180	19,981	24,671	25,049	31,130
Net unclassified assets 3/	-2,223	-18,224	-1,637	-214	-6,476
Other foreign liabilities	**255,959**	**228,454**	**279,546**	**254,991**	**254,914**
Medium- and long-term liabilities	255,959	228,454	279,546	254,991	254,914
Liabilities to the private sector	**98,646**	**50,666**	**61,408**	**84,555**	**85,554**
In domestic currency	97,264	45,357	53,417	76,820	73,718
Demand deposits	3,096	3,307	3,172	3,495	3,486
Saving deposits	345	35,275	33,295	44,179	39,098
Time deposits and other obligations	93,823	6,775	16,950	29,146	31,134
In foreign currency	1,381	5,310	7,991	7,735	11,836
	(In percent of GDP, unless otherwise indicated)				
Memorandum items:					
Exchange rate (Mex$ per US$) 4/	7.9	8.1	9.9	9.5	9.6
Net foreign assets	1.2	0.5	0.7	0.5	0.5
Net claims on Bank of Mexico	0.1	-0.1	-0.1	-0.1	-0.1
Net domestic credit	12.7	8.4	8.3	7.1	5.9
Of which					
Credit to the private sector	3.5	2.5	1.9	1.8	1.7
Adjusted credit to the private sector 5/	3.5	2.9	2.4	2.2	2.1
Other foreign liabilities	10.1	7.2	7.3	5.6	4.7
Liabilities to the private sector	3.9	1.6	1.6	1.8	1.6

Source: Bank of Mexico.

1/ From January 1997 onwards, monetary aggregates are based on resident financial institutions only.
2/ Excludes liabilities to official trust funds of the Bank of Mexico.
3/ Includes other assets, statistical discrepancies, interbank float, repurchase operations, assets restructured into UDI (cetes especiales), and capital and surplus.
4/ End of period.
5/ Including assets sold to FOBAPROA and assets restructured into UDI (cetes especiales).

Table 27. Mexico: Exports by Principal Categories 1/

	1996	1997	1998	1999	Prel. 2000
	(In millions of U.S. dollars)				
Total exports, f.o.b. 1/	**96,000**	**110,431**	**117,460**	**136,391**	**166,455**
Agriculture and fishing products 2/	**4,537**	**5,010**	**4,931**	**5,125**	**5,439**
Coffee	779	1,001	792	737	763
Tomatoes	540	523	589	535	463
Other fruits and vegetables	1,699	1,914	2,204	2,392	2,494
Cattle	217	331	327	419	573
Shrimp	421	491	414	428	457
Other	881	750	605	615	690
Petroleum products	**11,654**	**11,323**	**7,134**	**9,928**	**16,383**
Crude oil	10,705	10,334	6,368	8,859	14,887
Other petroleum products	948	989	766	1,069	1,496
Mining products 1/	**777**	**800**	**892**	**851**	**952**
Silver	328	322	426	399	432
Other	449	478	466	453	521
In-bond industries (net)	**6,416**	**8,834**	**10,526**	**13,444**	**17,759**
Electric and electronic equipment	7,426	8,696	9,089	10,659	13,184
Other industries	-1,010	137	1,438	2,785	4,575
Other Manufacturing	**79,033**	**93,299**	**104,502**	**120,486**	**143,664**
Transport equipment	19,695	20,832	23,691	27,476	32,337
Other machinery and equipment	9,757	12,920	14,961	18,415	23,074
Other industries	49,581	59,547	65,850	74,595	88,254
	(Annual percentage change)				
Total exports (value)	20.7	15.0	6.4	16.1	22.0
Petroleum exports	38.4	-2.8	-37.0	39.2	65.0
Non-oil exports	18.6	17.5	11.3	14.6	18.7
	(In percent of total exports)				
Agriculture	4.7	4.5	4.2	3.8	3.3
Petroleum products	12.1	10.3	6.1	7.3	9.8
Mining	0.8	0.7	0.8	0.6	0.6
Manufactures	82.3	84.5	89.0	88.3	86.3
In-bond industries (net)	6.7	8.0	9.0	9.9	10.7

Sources: Bank of Mexico; National Institute of Statistics and Geography; and Fund staff estimates.

1/ Since 1992, merchandise trade includes the gross flows of the in-bond industries.
2/ Includes processed products.

Table 28. Mexico: Imports by Principal Categories 1/

	1996	1997	1998	1999	Prel. 2000
	(In millions of U.S. dollars)				
Total imports, f.o.b.	**89,469**	**109,808**	**125,373**	**141,975**	**174,458**
Consumer goods	**6,657**	**9,326**	**11,109**	**12,175**	**16,691**
Food, drinks, and tobacco	1,955	2,355	2,596	2,886	3,701
Textiles	635	959	1,337	1,379	1,548
Automobiles	922	1,510	2,117	2,554	4,425
Other	3,145	4,502	5,058	5,356	7,017
Intermediate goods 1/	**71,890**	**85,366**	**96,935**	**109,270**	**133,637**
Petroleum products	837	1,249	1,240	1,539	2,826
Chemicals 2/	6,384	7,553	8,333	9,063	10,251
Parts for machinery and transport equipment	17,421	21,203	23,800	26,794	33,037
Iron and steel	4,268	5,116	5,821	5,823	7,061
Other	42,979	50,246	57,742	66,050	80,463
Capital goods	**10,922**	**15,116**	**17,329**	**20,530**	**24,130**
	(Annual percentage change)				
Total imports (value)	23.5	22.7	14.2	13.2	22.9
Consumer goods	24.8	40.1	19.1	9.6	37.1
Intermediate goods	23.1	18.8	13.6	12.7	22.3
Capital goods	25.6	38.4	14.6	18.5	17.5
	(In percent of total imports)				
Consumer goods	7.4	8.5	8.9	8.6	9.6
Intermediate goods	80.4	77.7	77.3	77.0	76.6
Capital goods	12.2	13.8	13.8	14.5	13.8

Sources: Bank of Mexico; National Institute of Statistics and Geography; and Fund staff estimates.

1/ Including imports for in-bond industries.
2/ Excluding petrochemicals.

Table 29. Mexico: Direction of Trade

(In percent)

	1996	1997	1998	1999	Prel. 2000
Exports	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
United States	84.0	85.6	87.9	88.3	88.7
Canada	2.3	2.0	1.3	1.8	2.0
Central and South America	6.5	6.0	5.0	4.0	4.0
Central American Common Market	0.9	1.0	1.1	0.9	0.8
Chile	0.7	0.8	0.5	0.3	0.3
G-3 1/	0.9	1.1	0.8	0.6	0.6
Mercosur	1.6	1.2	0.9	0.5	0.6
Other America	2.4	2.0	1.7	1.2	1.4
European Union	3.7	3.6	3.3	3.8	3.4
Other Europe	0.6	0.4	0.4	0.5	0.5
Japan	1.4	1.0	0.7	0.6	0.6
Other Asia	1.1	1.0	0.9	1.0	0.7
Other	0.3	0.4	0.5	0.2	0.1
Imports	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
United States	75.6	74.8	74.5	74.1	73.1
Canada	1.9	1.8	1.8	2.1	2.3
Central and South America	2.5	2.4	2.3	2.5	2.8
Central American Common Market	0.2	0.2	0.2	0.2	0.2
Chile	0.4	0.3	0.4	0.5	0.5
G-3 1/	0.4	0.5	0.4	0.4	0.4
Mercosur	1.2	1.0	1.1	1.0	1.2
Other America	0.3	0.3	0.3	0.2	0.3
European Union	8.6	9.0	9.3	9.1	8.6
Other Europe	0.8	0.9	1.0	0.9	1.0
Japan	4.4	3.9	3.6	3.6	3.7
Other Asia	5.2	6.2	6.4	7.1	7.9
Other	0.9	0.9	1.0	0.6	0.6

Sources: Bank of Mexico; National Institute of Statistics and Geography; and Fund staff estimates.

1/ G-3 is a reference to the free-trade agreement among Mexico, Venezuela, and Colombia.

Table 30. Mexico: Quarterly Balance of Payments

(In billions of U.S. dollars)

	1998				Year	1999				Year	Prel. 2000				Year
	I	II	III	IV	1998	I	II	III	IV	1999	I	II	III	IV	2000
Current account	**-3.2**	**-3.4**	**-4.7**	**-4.7**	**-16.1**	**-3.6**	**-2.9**	**-3.2**	**-4.4**	**-14.1**	**-4.7**	**-3.4**	**-3.8**	**-6.3**	**-18.1**
Goods	-1.7	-1.2	-2.4	-2.6	-7.9	-1.2	-1.0	-1.0	-2.4	-5.6	-1.1	-1.4	-1.8	-3.6	-8.0
Exports	18.4	19.5	17.9	19.1	74.9	19.2	21.2	22.2	23.4	86.0	24.7	25.9	26.8	27.3	104.7
of which: Oil and derivatives	2.0	1.9	1.7	1.5	7.1	1.5	2.1	2.9	3.3	9.9	3.9	4.1	4.5	3.9	16.4
Imports	-20.1	-20.7	-20.4	-21.6	-82.8	-20.4	-22.2	-23.1	-25.8	-91.6	-25.9	-27.3	-28.7	-30.9	-112.7
Services	0.3	-0.5	-0.4	-0.4	-0.9	0.0	-0.4	-0.8	-0.6	-1.8	-0.2	-0.7	-0.8	-0.7	-2.3
Tourism and border travel	1.2	0.7	0.6	0.7	3.3	1.1	0.7	0.4	0.5	2.7	1.1	0.7	0.4	0.6	2.8
Freight and insurance	-0.9	-0.9	-0.9	-1.0	-3.7	-0.9	-1.0	-1.0	-1.1	-4.1	-1.2	-1.2	-1.3	-1.4	-5.0
Other	0.0	-0.2	-0.1	-0.2	-0.5	-0.2	-0.1	-0.1	0.0	-0.4	-0.1	-0.2	0.1	0.1	-0.1
Income	-3.1	-3.4	-3.5	-3.3	-13.3	-3.7	-3.2	-3.1	-3.0	-13.0	-4.8	-3.1	-3.0	-3.9	-14.7
Interest payments	-3.0	-3.1	-3.2	-3.1	-12.5	-3.3	-3.1	-3.4	-3.2	-13.0	-3.7	-3.3	-3.4	-3.6	-14.0
Other	-0.1	-0.2	-0.2	-0.2	-0.8	-0.4	-0.1	0.3	0.2	0.0	-1.2	0.3	0.4	-0.3	-0.8
Transfers	1.3	1.6	1.5	1.6	6.0	1.4	1.7	1.6	1.7	6.3	1.5	1.7	1.8	1.9	7.0
Financial account	**6.2**	**2.3**	**2.4**	**7.6**	**18.4**	**2.2**	**4.6**	**5.3**	**7.2**	**19.3**	**8.4**	**1.6**	**6.7**	**5.6**	**22.3**
Public sector	**1.3**	**-0.5**	**-2.2**	**2.9**	**1.6**	**-0.2**	**-0.3**	**-0.5**	**-0.3**	**-1.2**	**2.9**	**-5.1**	**1.6**	**-2.4**	**-3.1**
Medium- and long-term capital	-0.3	0.0	-1.4	3.1	1.5	-0.5	-0.1	0.2	0.4	0.0	1.7	-2.1	-1.7	-3.3	-5.4
Short-term capital	0.9	0.0	-0.2	-0.5	0.3	0.0	0.5	-0.1	-0.4	0.0	-0.8	0.2	-0.3	0.8	-0.2
Treasury bill sales	0.9	-0.4	-0.5	0.4	0.3	0.3	-0.6	0.0	0.4	0.1	0.4	-0.8	0.1	0.3	0.1
Other	-0.1	-0.1	-0.1	-0.1	-0.4	0.0	-0.1	-0.5	-0.6	-1.2	1.6	-2.4	3.4	-0.1	2.5
Private sector	**4.9**	**2.8**	**4.5**	**4.6**	**16.9**	**2.4**	**5.0**	**5.7**	**7.4**	**20.5**	**5.5**	**6.8**	**5.1**	**8.0**	**25.4**
Direct investment	3.2	3.7	2.3	2.1	11.3	3.0	2.8	2.6	3.6	11.9	3.3	3.9	2.5	3.5	13.3
Net external credits	0.9	1.6	1.4	1.9	5.8	2.3	-0.5	0.6	1.6	3.9	1.1	1.5	0.5	3.3	6.3
Bond placements	1.1	0.1	-1.4	-0.3	-0.4	0.3	1.5	-0.2	0.8	2.4	0.4	-0.1	0.5	-0.5	0.3
Equity investments	0.2	-1.0	-0.2	0.3	-0.7	-0.1	0.8	2.2	0.8	3.8	0.4	1.4	-0.6	-0.9	0.4
Other	-0.6	-1.6	2.4	0.6	0.9	-3.0	0.4	0.5	0.7	-1.4	0.3	0.0	2.1	2.6	5.0
Errors and omissions	**-1.5**	**1.7**	**1.1**	**0.1**	**1.3**	**1.7**	**-0.2**	**-0.9**	**-2.1**	**-1.4**	**1.2**	**-1.0**	**1.7**	**2.1**	**4.0**
Net international reserves (increase -)	**-1.4**	**-0.6**	**1.3**	**-3.0**	**-3.7**	**-0.4**	**-1.6**	**-1.2**	**-0.8**	**-3.9**	**-5.0**	**2.7**	**-4.6**	**-1.4**	**-8.2**

Sources: Bank of Mexico; and Fund staff estimates.

Table 31. Mexico: External Debt Outstanding

(In millions of U.S. dollars)

	1996	1997	1998	1999	Prel. 2000
Total external debt	**164,769**	**153,327**	**161,464**	**166,385**	**149,322**
Public sector	**111,563**	**97,409**	**100,674**	**96,763**	**84,600**
Medium and long term	93,294	84,261	87,897	87,997	80,304
Multilaterals	17,948	16,649	17,152	16,822	17,342
Bonds, public placements	29,210	26,686	27,846	33,124	36,091
Brady bonds	24,353	23,717	24,013	23,468	16,065
Other restructured debt	5,772	4,888	4,375	4,366	1,818
Commercial banks and other	16,011	12,322	14,511	10,217	8,988
Short term	4,991	4,061	4,398	4,293	4,296
IMF	13,279	9,087	8,380	4,473	0
Private sector	**53,206**	**55,918**	**60,790**	**69,623**	**64,722**
Commercial banks	19,388	16,804	15,815	14,124	11,373
Forcign banks	10,445	10,381	10,553	8,778	7,093
Bonds	8,943	6,423	5,262	5,346	4,280
Private sector	33,818	39,114	44,975	55,499	53,349
Commercial banks	16,033	18,479	22,697	26,227	24,950
Bonds	17,785	20,635	22,278	29,271	28,399

Sources: Secretariat of Finance and Public Credit; Bank of Mexico; and Fund staff estimates.