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INTERNATIONAL MONETARY FUND

MEXICO

Selected Issues

Prepared by Western Hemisphere Department in Collaboration with Other Departments

Approved by the Western Hemisphere Department

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A. Introduction

1. **The Asian crisis in 1997–98 highlighted the possibility that vulnerabilities in the nonfinancial corporate sector can become of macroeconomic relevance** despite generally sound fiscal positions and apparently solid financial sectors. However, no generally accepted methodology has been established on how best to include corporate sector analysis into Fund surveillance activity and program work. In particular, little work has been done outside of Asia, although there is a general recognition that corporate sector fragilities may constitute an important part of macroeconomic vulnerabilities in all member countries.

2. Mexico's strides toward macroeconomic stability in recent years are well known and the country now boasts an investment grade rating from the three major credit rating agencies. Likewise, the banking system has been considerably strengthened, but at the same time has continued to reduce its credit exposure to companies. Hence, **corporates have financed part of their operations by accessing capital markets directly**, especially international ones, but more recently also the domestic corporate bond market, which, although still small, is now growing significantly.

3. **This chapter attempts to assess the potential financial vulnerabilities of the corporate sector in Mexico**, relying mainly on balance sheet and profitability analysis of the companies quoted on the stock exchange. Although this analysis is insufficient to draw definitive conclusions about the Mexican corporate sector at large, we believe it is sufficient to analyze the main financial vulnerabilities, as the set of quoted companies is close to the universe of companies that have had access to foreign capital and to the local bond market and captures a large share of domestic bank credit.

4. **Our assessment is that the Mexican quoted companies are overall in good financial health**, and that recent external payment difficulties experienced by some companies are either sector or company-specific. **However, some second-tier companies are found to have significantly higher leverage, and to be more exposed to exchange rate and refinancing risk than the average quoted firm.**

5. **This assessment is supported by the stress tests conducted on the balance sheet and operational results of a group of the largest quoted companies.** The solvency tests—which compare the capital losses from relative price changes to accounting capital of individual firms—show that widespread solvency problems are highly unlikely. On the other hand, the liquidity tests—which compare the gross financing need (in peso terms) to available financing during a period of adverse market developments—indicate that a sharp reduction in market access would likely generate liquidity difficulties in a number of firms.

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[1] Prepared by Ketil Hviding (PDR) and Laura Papi (ICM).

6. The chapter is organized as follows. Section B provides an overview of salient features of the Mexican corporate sector. Section C analyses the key financial ratios of publicly traded companies. Section D presents the formal stress tests that estimates the potential effects of some macroeconomic and financial shocks, such as a sharp depreciation of the exchange rate, a sustained increase in interest rates, a slowdown in demand, and a prolonged international market closure, on the corporate sector. Section E concludes.

B. Key Structural Features

7. **The Mexican corporate sector is very segmented between a first-tier of large companies and a large "under wood" of smaller companies**. Typically, the first-tier companies have a significant share of their respective market and most of them are quoted on the Mexican stock exchange (*Bolsa Mexicana de Valores,* BMV), even though a few large companies remain privately owned. While most of the larger companies are mainly export oriented, some of them are giants in telecommunication, retail trade, and media. Overall, the smaller companies are more dependent on the domestic market. These are the companies that stand most to gain from a revitalization of the banking sector and collateralized lending and most to loose from a protracted slowdown in economic activity.

8. **Although a large majority of Mexican companies are of small and medium size, the present chapter will focus mainly on the larger companies, as these are the only companies with significant access to finance that is not internally generated**. Companies quoted on the BMV, in turn, represent a large majority of the large companies. In particular, from the perspective of external vulnerability, it is relevant to note that companies quoted on the BMV account for over 80 percent of private corporate external debt.

Economic structure of the company sector

9. **The structure of the Mexican economy is relatively well balanced between manufacturing, trade, services, and other sectors,** both in terms of value added and employment (Table 1). Moreover, agriculture and fishing constitute a minor share of production compared to most other emerging market economies. Excluding the public sector, nearly three quarters of value added is produced by small and medium-sized companies (SMEs), that is companies with less than 500 employees. With a value added share of 95 percent, the concentration of SMEs is largest in the manufacturing sector. By contrast, large companies dominate sectors such as electricity and water production.

Table 1. Mexico: Characteristics of the Corporate Sector, 1999
(In percent of total)

	Number of Companies	Persons Occupied	Value Added
Manufacturing	12	27	37
SME	100	65	95
Large	0	35	5
Trade	51	25	23
SME	100	87	76
Large	0	13	24
Services	33	25	18
SME	100	74	63
Large	0	26	37
Other 1/	3	23	22
SME	98	76	35
Large	2	24	65
Total	100	100	100
SME	100	75	72
Large	0	25	28

Source: National Institute of Statistics and Geography (INEGI), Census 1999.

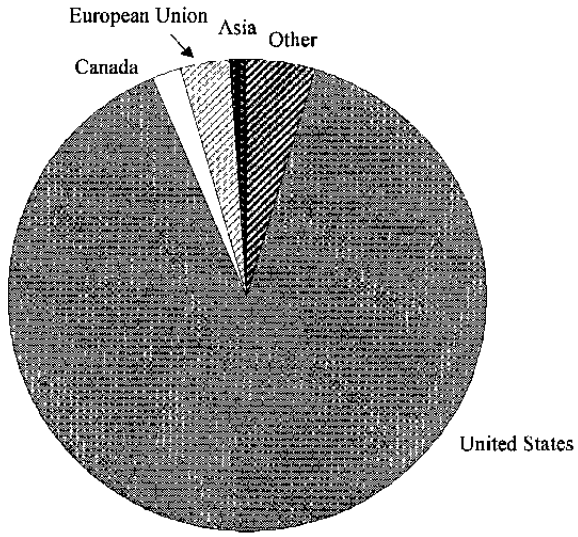
1/ Construction, communications, electricity, water, transport, fishing, and mining.

10. **The economy is heavily export-oriented**, a reflection of an increasingly strong economic integration with the United States after NAFTA.[2] In 2001, as much as 91 percent of exports were destined to NAFTA (Figure 1).[3] Despite its small share in value added, the *maquiladora* industry, which uses relatively cheap labor to assemble intermediate products and re-exports the final product, has become increasingly important for the Mexican economy. Benefiting from a special tax and tariff regime, the *maquiladora* industry, mainly owned and operated by foreign companies, was responsible for about a quarter of all manufacturing goods exported (net of the sector's imports) in 2001.

[2] Exports and imports of goods and services constitute about 40 percent of GDP, even when only the outward processing industry's (*maquiladoras*) net exports are included in total trade.

[3] Markets outside of NAFTA, including other Latin American countries, are not very important for Mexican companies. Of total merchandise exports, less than 5 percent is shipped to other developing countries in the Western Hemisphere. Moreover, most exports that are sent south of the border go to Central America. Noticeably, exports to two large Latin American countries, Argentina and Brazil, are negligible: in 2001, only 0.6 percent of merchandise exports were to these countries.

Figure 1. Mexico: Geographical Distribution of Exports, 2001



Source: National Institute of Statistics and Geography (INEGI).

11. **Mexico's stock exchange is dominated by a few large service and consumer goods producing companies as well as some large exporters with significant market shares in their respective markets** and high profit margins[4] (most of the larger companies have at least a domestic market share of 50 percent). With a total market capitalization of nearly US$50 billion, the three largest companies are responsible for close to 40 percent of the market's total capitalization. The sectoral distribution of publicly traded companies reflects quite well that of the overall economy (Table 2). About two thirds of the BMV companies are exporters, of which a third are large exporters (Figure 2, Table 3). In the aggregate, foreign sales account for about a fifth of total sales.

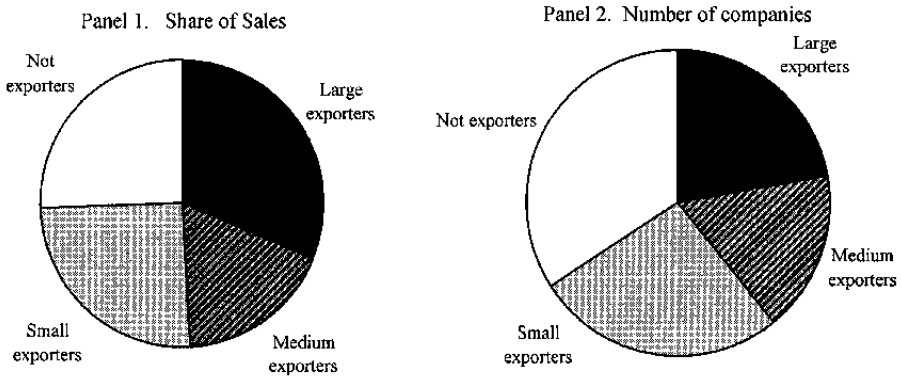
Table 2. Mexico: Sectoral Composition of the Mexican Stock Exchange
(In percent)

	Manufacturing	Services	Trade	Construction	Mining
Based on number of firms	52.6	21.1	15.8	7.0	3.5
Based on assets	48.3	29.0	12.2	3.4	7.2
Based on sales	46.9	22.2	24.7	2.2	4.0

Source: Mexican Stock Exchange (BMV).

[4] For example, UBS Warburg (2002) reports that Mexican "blue chips" have higher EBITDA margins, higher return on equity, and higher return on assets than their international counterparts.

Figure 2. Mexico: Export Orientation of the Mexican Stock Exchange 1/



Source: Mexican Stock Exchange (BMV).

1/ Large, medium, and small exporters are defined as companies with foreign sales of more than 25 percent, from 10 to 25 percent, and less than 10 percent of total sales, respectively.

Table 3. Mexico: Export Orientation of the Mexican Stock Exchange 1/
(In percent)

	Exporters	Large Exporters	Medium Exporters	Small Exporters	Not Exporters
Based on number of firms	65.8	22.2	17.1	26.5	34.2
Based on assets	84.5	40.5	19.6	24.4	15.5
Based on sales	74.4	31.4	17.8	25.1	25.6

Source: Mexican Stock Exchange (BMV).

1/ Large (medium, small) exporters have foreign sales accounting for more than 25 (between 10–25 percent, and less than 10 percent) of total sales.

12. **Although the companies quoted on the stock exchange are responsible for only a small share of private sector value added and employment** (in 2001, total employment of quoted companies amounted to about 1 million or 7 percent of total employment; value added amounted to about US$41 billion[5] or less than 7 percent of GDP), **these companies play a key role in the Mexican economy**. First, as most of the quoted companies are exporters their share in exports is significantly larger than their share in value added or employment: data on their foreign sales suggest that they are responsible for nearly 80 percent of non-oil exports of goods and services. Second, the quoted companies constitute important planks in the productive network as they depend on a large number of semi-dependent suppliers. Finally,

[5] Based on gross operating surplus (net sales excluding cost of goods sold but including operating costs and depreciation).

the quoted companies often cement the vertical productive integration by the use of suppliers' credits, which play a particularly important role in Mexico given the insufficient supply of bank credit to small and medium-sized companies (see Chapter II).

Legal structure

13. A large majority of nonfinancial companies in Mexico are incorporated as limited-stock companies (*sociedad anonima,* SA); unlimited partnership (*sociedad en nombre colectivo*, SNC) are mainly reserved for professional services, while limited companies (*sociedad de responsibilidad limitada*, SRL) are mainly used by micro-enterprises. Any company can be incorporated as a limited–stock company as long as it has at least two shareholders with at least Mex$50,000 in paid-in capital. Every *sociedad anonima* needs to present audited annual accounts, have a board of directors, have an independent examiner responsible to oversee the interest of all the shareholders, and needs a reserve cushion based on retained net after-tax profits of at least 20 percent of original capital. Normally, a limited-stock company cannot issue additional shares unless it has changed its charter to permit such transactions to become a *sociedad anonima* de capital variable (*SA de CVA*).

14. **A new bankruptcy law (*Ley de concursos mercantiles)* was approved in May 2000**, replacing the 57-year-old bankruptcy code: the new bill is aimed at improving creditors' rights, facilitate collateralized lending, and provide the appropriate incentives for stakeholders to maintain as much as possible of the economic value of the firm during reorganization. The old bankruptcy law was replaced since it had become clear that it did not achieve its objectives: the recovery rate of secured loans was not significantly larger than in the case of unsecured loans,[6] the process was slow and debtors were able to lengthen its duration by employing delay tactics. In addition, it was considered particularly onerous to foreign investors as all debt was converted into peso-denominated debt. Although the experience with the new law is limited, the litigation process has become more transparent and efficient and creditors' rights seem to have been enhanced.

Corporate governance

15. **A new Securities Markets Law was enacted in April 2001 aimed at enhancing the protection of minority shareholders' rights, increase market transparency, and improve corporate governance of issuers and intermediaries**. Among the most important changes are those directed at making the capital structure of enterprises closer to "one share, one vote" by limiting the issuance of shares with restricted voting rights.[7] To improve corporate governance, the new law also establishes the requirement that a minimum of

[6] See, for example, Fitch IBCA, Duff and Phelps, 2001.

[7] Previously, the existence of several classes of shares, some of which without voting rights, entailed that several companies were controlled with a small percentage of the shares.

25 percent of board members be independent.[8] In addition, the *Comission Nacional Bancaria y de Valores* (CNBV) is explicitly granted the power to regulate tender offers in order to prevent the exclusion of minority shareholders from the benefits of these transactions: when an offer would entail a significant stake in a company, it has to occur via a public tender offer at the same price for all classes of shares. Higher standards for the release of information and measures to reduce the scope for the use of privileged information, market manipulation, and insider trading have also been introduced by the new legislation.

16. **These changes are expected to improve the investment environment in the stock market considerably, even though in some cases, e.g., the minimum percentage of independent directors, the regulations still fall short of international best practices.**[9] Nevertheless, implementation will be key and the involvement of domestic institutional investors should bring about the required discipline to translate the good intentions of the legislators into practice.[10]

C. Balance Sheet and Profitability Analysis

17. This section focuses on the financial characteristics of Mexican firms, both in terms of financing structure and corporate performance, with the aim to bring out some stylized facts. **The analysis suggests that while the leverage of Mexican companies seems relatively low on average, there are significant differences across firms with some second-tier companies with significantly higher-than-average leverage and rather low liquidity ratios.** Further, the debt structure is less favorable because of the high share of foreign exchange debt, while the share of short-term debt does not appear to be particularly high. The share of foreign exchange debt would be of concern particularly if the sizable foreign exchange assets were to prove illiquid in a crisis situation. Finally, although profitability appears to be on average rather low, the data do not present a clear picture.

18. Two main data sets were used in this analysis:

- The first data set is from Worldscope, consisting of 55 Mexican companies (all listed on the BMV) and allows us to carry out an international comparison of the main balance sheet characteristics (Appendix Tables I–V).

- The second data set is from the BMV, which covers 117 publicly traded companies, and allows us to carry out an in depth and up-to-date analysis of the quoted companies' balance sheet and income flow (Table 4).

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[8] The law also establishes stricter rules concerning governance of financial intermediaries, including the requirement that at least 25 percent of board members be independent.

[9] See OECD, 1999.

[10] See also Chapter II: "Private Sector Financing in Mexico."

Table 4. Mexico: Size Indicators
(In millions of pesos, as of December 2001)

	1Q2000	2Q2000	3Q2000	4Q2000	1Q2001	2Q2001	3Q2001	4Q2001
Assets								
Total	1,413,385	1,420,727	1,352,663	1,427,805	1,374,619	1,323,732	1,346,143	1,359,853
Percent change year-on-year	4.8	4.1	-1.2	-4.3	-2.7	-6.8	-0.5	-4.8
In US$ billion	154.6	155.4	148.0	156.2	150.4	144.8	147.3	148.8
Accounting capital								
Total	682,489	688,908	623,897	642,803	618,130	615,338	618,951	621,207
Percent change year-on-year	-6.8	-7.9	-18.4	-19.3	-9.4	-10.7	-0.8	-3.4
In US$ billion	74.7	75.4	68.3	70.3	67.6	67.3	67.7	68.0
Number of employees								
Total	985,332	99,117	1,009,231	1,008,842	1,010,.372	995,714	988,368	991,929
Percent change year-on-year	4.2	2.6	3.5	0.5	2.5	0.5	-2.1	-1.7
Net sales (cumulative)								
Total	23,6147	476,807	739,861	1,014,606	241,962	489,107	751,298	1,026,742
Percent change year-on-year	9.3	4.4	5.6	5.2	2.5	2.6	1.5	1.2
In US$ billion	25.8	52.2	80.9	111.0	26.5	53.5	82.2	112.3
Foreign sales/total sales	20.2	20.2	20.5	19.7	19.9	19.8	20.1	19.0

Sources: Mexican Stock Exchange (BMV); Bank of Mexico; and Fund staff calculations.

19. The BMV data set is complemented by individual company data of a subgroup of the BMV companies consisting of the 25 firms that have the largest foreign exchange debt in dollar terms: this group is referred to as the top 25 companies and is used to analyze in detail company-specific vulnerabilities. These companies are responsible for about 90 percent of foreign exchange debt and 76 percent of assets of the quoted companies.

Leverage and debt structure

Debt to capital

20. **While in the aggregate leverage is rather low, the most indebted firms are rather highly leveraged**. The Worldscope data indicate that the leverage of Mexican companies is relatively low compared to most other large emerging market economies and a few selected developed economies (Appendix Tables I–V). With a median of less than 0.5, the debt to capital ratio of Mexican corporations is lower than any of the other countries in the sample. However, the third quartile, albeit still significantly lower than in the Asian countries, is at a relatively high level for Latin America, and has been on an upward trend since 1996. At the

end of 2001, the average debt to capital ratio of the BMV data was unity, about 20 percent higher than in 1999 (Table 5). The third quartile of the top 25 sample was at 1.6 times, a rather high level (Table 6). In addition, small exporters are more leveraged than the average firm (Table 7).

Table 5. Mexico: Financial Ratios

	1Q2000	2Q2000	3Q2000	4Q2000	1Q2001	2Q2001	3Q2001	4Q2001
Leverage and debt structure								
Debt to equity 1/	0.9	0.9	1.0	1.0	1.0	0.9	1.0	1.0
Total liabilities to equity	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2
Total liabilities to equity and liabilities	51.7	51.5	53.9	55.0	55.0	53.5	54.0	54.3
Short-term debt to total debt	51.4	51.1	53.4	56.3	53.3	52.4	51.5	52.1
Short-term debt plus other percent of total liabilities	45.2	45.1	46.5	48.0	46.2	44.9	44.9	44.6
FX debt to total debt	63.4	63.1	62.4	63.7	65.8	66.7	67.2	65.0
Short term	37.9	38.2	39.1	44.1	44.9	44.9	45.6	43.4
Long term	90.3	89.2	89.0	89.0	89.6	90.8	90.3	88.4
FX debt to total liabilities	51.4	51.3	51.3	51.9	53.1	54.0	54.9	52.6
Liquidity indicators								
Current ratio 2/	1.4	1.4	1.2	1.1	1.2	1.2	1.2	1.2
Interest coverage ratio 3/	2.8	2.8	2.9	2.8	2.6	3.0	3.2	3.1
Net interest coverage ratio 4/	3.8	3.9	4.0	4.0	3.8	4.1	4.3	4.2
Profitability indicators								
Gross margins (in percent) 5/	36.5	36.5	36.4	36.3	35.6	36.1	36.4	35.9
Operating margins (in percent) 6/	14.0	14.6	14.5	14.3	12.8	13.2	13.4	13.0
Net margin (in percent) 7/	11.5	7.0	7.8	7.4	6.7	8.7	6.6	6.0
Return on equity (annual) 8/	15.9	9.7	12.3	11.6	10.5	13.8	10.7	10.0
Return on assets (annual) 9/	7.7	4.7	5.7	5.2	4.7	6.4	4.9	4.6

Sources: Mexican Stock Exchange (BMV); Bank of Mexico; and Fund staff calculations.

1/ Debt is the sum of short-term and long-term liabilities. The equity measure used here is accounting capital, which is a book value concept.

2/ Current assets to current liabilities.

3/ Operating profits (EBIT) to gross interest expenses. The underlying data are cumulative for the year, hence, Q4 data refer to the whole year.

4/ Operating profits (EBIT) to gross interest expenses.

5/ Gross profit in percent of sales.

6/ Operating earning (EBIT) in percent of sales.

7/ Net profit in percent of sales.

8/ Net profit in percent of accounting capital.

9/ Net profit in percent of total assets.

Table 6. Mexico: Financial Ratios for the Top 25 Firms, end-2001 1/

	Average	Median	First Quarter	Third Quartile
Leverage and debt structure				
Debt to equity 2/	1.1	1.3	0.8	1.6
Total liabilities to equity	1.3	1.5	1.0	2.1
Total liabilities to equity and liabilities	0.6	0.6	0.5	0.7
Short-term debt to total debt	46.5	46.2	37.9	55.1
Short-term debt plus other percent of total	48.2	47.1	39.6	55.6
FX to total debt	71.5	83.2	62.8	90.8
Short term	50.4	71.1	44.2	77.3
Long term	89.8	96.2	82.6	100.0
FX debt to total liabilities	59.6	65.2	51.4	77.2
Liquidity indicators				
Current ratio 3/	1.1	1.2	0.9	1.8
Interest coverage ratio 4/	2.8	1.5	0.4	3.2
Net interest coverage ratio 5/	3.7	1.7	0.1	3.4
Profitability indicators				
Gross margins in percent 6/	41.5	35.7	23.5	46.3
Operating margins in percent 7/	15.9	9.5	4.2	15.5
Net margin in percent	6.6	2.0	-1.7	7.7
Return on equity (annual) 9/	9.7	4.1	-1.8	13.4
Return on assets (annual) 10/	4.1	1.8	-1.1	5.8

Sources: Mexican Stock Exchange (BMV); Bank of Mexico; and Fund staff calculations.

1/ These firms are the top 25 terms of FX liabilities. These data refer to the last quarter of 2001. Flow data refer to the whole of 2001.

2/ Debt is the sum of current and long-term liabilities. The equity measure used here is accounting capital, which is a book value concept.

3/ Current assets to current liabilities.

4/ Operating profits (EBIT) to gross interest expenses. The underlying data are cumulative for the year, hence Q4 data refer to the whole year.

5/ Operating profits (EBIT) to gross interest expenses.

6/ Gross profit in percent of sales.

7/ Operating earning (EBIT) in percent of sales.

8/ Net profit in percent of sales.

9/ Net profit in percent of accounting capital.

10/ Net profit in percent of total assets.

Table 7. Mexico: Financial Ratios by Type of Company
(As of the 4Q2001)

	Exporters	Large Exporters	Medium Exporters	Small Exporters	Not Exporters
Leverage and debt structure					
Debt to equity 1/	1.0	1.1	0.6	1.4	0.6
Total liabilities to equity	1.3	1.3	0.9	1.6	0.8
Total liabilities to equity and liabilities	0.6	0.6	0.5	0.6	0.4
Short-term debt to total debt	48.3	44.7	47.4	54.0	80.7
Short-term debt plus other percent of total liabilities	42.3	40.1	35.4	49.8	60.7
FX to total debt	70.4	84.3	70.5	50.4	23.6
Short term	49.7	74.3	54.4	18.2	14.6
Long term	89.7	92.3	85.0	88.0	61.2
FX debt to total liabilities	57.7	69.4	51.6	43.7	17.3
Net FX position (in US$ billion)	(13.0)	(0.3)	(4.3)	(8.4)	(1.2)
In percent of capital	(23.5)	(1.3)	(27.7)	(61.0)	(9.6)
Liquidity indicators					
Current ratio 2/	1.2	1.1	1.9	1.0	1.4
Interest overage ratio 3/	2.9	1.5	3.7	4.2	6.9
Net interest coverage ratio 4/	3.6	1.8	6.1	5.2	45.6
Profitability indicators					
Gross margins (in percent) 5/	39.0	35.2	44.0	40.2	27.0
Operating margins (in percent) 6/	14.9	9.0	14.7	22.4	7.5
Net margin (in percent) 7/	6.3	2.2	6.0	11.7	5.2
Return on equity (annual) 8/	9.6	3.0	7.7	24.0	11.7
Return on assets (annual) 9/	4.2	1.3	4.1	9.1	6.5

Sources: Mexican Stock Exchange (BMV); Bank of Mexico; and Fund staff calculations.

1/ Debt is the sum of short-term and long-term liabilities. The equity measure used here is accounting capital, which is a book value concept.

2/ Current assets to current liabilities.

3/ Operating profits (EBIT) to gross interest expenses. The underlying data are cumulative for the year, hence, Q4 data refer to the whole year.

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6/ Operating earning (EBIT) in percent of sales.

7/ Net profit in percent of sales.

8/ Net profit in percent of accounting capital.

9/ Net profit in percent of total assets.

Short-term debt to total debt

21. **The ratio of short term to total debt was 52 percent at end-2001: this is not particularly high by emerging markets' standards, although it is by advanced markets' standards**. This ratio has been broadly stable since 1999. The top 25 companies have a better maturity structure of debt, with short-term debt accounting for 46 percent of total. The third quartile of the distribution was at 55 percent. This ratio had a mean of 37 percent in 2000 in

the Worldscope sample. Further, the third quartile stood at 53 percent, suggesting that few firms have a maturity structure of debt highly skewed toward short-term debt.[11]

Share of foreign currency debt

22. **About two-thirds of total debt is denominated in foreign currency and has been broadly stable since 1999: although lower than prior to the Tequila crisis, this ratio remains very high**, probably reflecting the low availability of domestic credit, as well as the importance of trade credits and the integration of the Mexican economy with the United States. Further, foreign exchange debt accounted for 88 percent of long-term debt and 43 percent of short-term debt (Figure 3).[12] This means that firms' long-term financing needs, i.e., related to investment expenditure, are satisfied mostly with foreign resources, while domestic resources are used mainly for short-term financing, mostly working capital. For the top 25 firms, foreign exchange debt was 72 percent of total, with a median of 83 percent and the third quartile at 91 percent. This is easily explained by the fact that only a few firms have had access to foreign capital and hence foreign exchange debt is concentrated in relatively few firms and by the choice of the top 25 firms as the most indebted in foreign exchange terms (based on the absolute dollar amount). In addition, as could be expected the larger exporters have a larger proportion of debt in foreign exchange.[13] Nevertheless, increased availability of domestic credit, especially provided by domestic institutional investors, could lead to a gradual change in the currency composition of corporate debt in the future.

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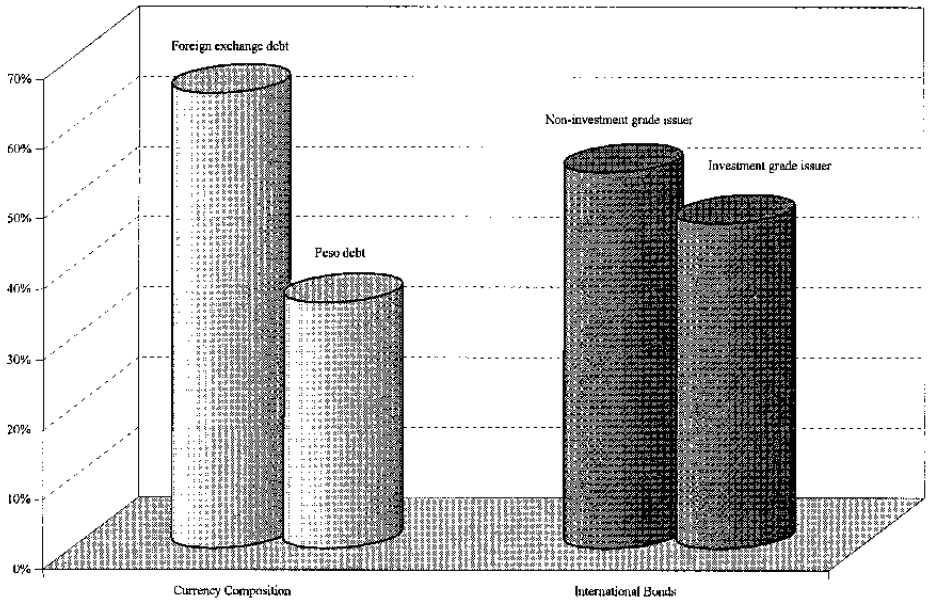
[11] The third quartile of this ratio reached about 70 percent in Korea and almost 90 percent in Indonesia just before the crisis.

[12] However, these ratios take only long-term and short-term debt liabilities into account. In total liabilities, there are some non-classified peso liabilities. If they are mainly short-term such as accounts payables/suppliers credits, then the ratio of foreign exchange debt in short-term liabilities is at about 30 percent.

[13] See Martinez and Werner (2002) for a discussion of the development in firms foreign exchange exposure since the early 1990s.

Figure 3. Mexico: Corporate Debt



Sources: Mexican Stock Exchange (BMV); and Capital Data.

Net foreign exchange position

23. **The net aggregate foreign exchange position of all BMV firms was a negative US$14.2 billion at end-2001 (18 percent of capital), of which US$11.5 billion was accounted by the top 25 firms (24 percent of capital).** However, the 25-firm sample illustrates very well the inadequacy of aggregate data to examine the net foreign exchange position, because in practice long foreign exchange positions of some firms cannot be netted out by the short positions of others. The median negative position of the top 25 firms amounts to 52 percent of capital while for the first quartile it is 95 percent of capital, which indicates that several firms are assuming sizable foreign exchange rate risk. Moreover, if we were to consider only the negative foreign exchange positions of individual companies, the negative position of the top 25 firms would amount to US$18.5 billion, equivalent to 56 percent of capital. Finally, small exporters were found to be in a particularly weak position, as their net negative foreign exchange position was even larger at 61 percent of capital.

24. **The major uncertainties in evaluating the exposure of Mexican corporations to foreign exchange risk are the liquidity of foreign exchange assets and the extent of their foreign exchange derivative operations.** No breakdown exists for foreign exchange assets and anecdotal evidence suggests that a significant part of these are equity holdings and participations abroad and hence are not likely to be very liquid. Information on corporations' foreign exchange derivative operations is not available. Both the authorities and market participants have indicated that a few sophisticated corporate treasuries do use foreign exchange derivatives in both directions, that is both to hedge their foreign exchange risk, but

also for example to swap proceeds of peso funding into dollars, which would increase foreign exchange risk. However, the general view seems to be that these operations are not very sizable and hence the on-balance sheet exposure should not be too far from the effective exposure: nevertheless, we were unable to confirm this.

25. **While Mexican corporations obtain the majority of foreign exchange credits from banks, the part that is most exposed to refinancing risk are international bonds, especially for non-investment grade companies, as this market is subject to episodes of closure**. International bond redemptions are sizable, especially in 2004, and given that a significant share of these bonds were issued before the Russia crisis, when risk appetite was much higher than at present, there could be difficulties refinancing them. Nevertheless, the fact that the domestic bond market is growing very rapidly and conditions are now favorable for a resumption of domestic bank credit which would reduce the refinancing risk over time (see Chapter II).[14]

Liquidity indicators

26. **The current ratio[15] for BMV firms is not particularly high**: it was 1.2 as of end-2001 and had declined slightly from 1.4 in 1999 (see Table 5). This ratio was not very different for the top 25 firms, but the variation across firms was very wide, with the first quartile at 0.86, a very low level, reflecting the fact that this sample includes two firms that have either restructured external debt or defaulted and four other firms that are experiencing some financial difficulties. In the Worldscope sample, the median was 1.5 percent and the first quartile was 1.1 in 2000, which were higher than Argentina and Brazil, but lower than Chile. These ratios were also higher than for Korea and Thailand before the crisis, although they have been declining since 1997.

27. **While the interest coverage ratio,[16] an indicator of liquidity and profitability, of the BMV firms appears to be at a relatively healthy level, the sample of the top 25 firms have a significantly lower ratio**, reflecting the fact that several companies in this sample have very low or even negative ratios, as the top 25 firms are more exposed to cyclical sectors (e.g., mining, commercial construction, and telecommunications) than the whole BMV sample and some had negative earnings in 2001.

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[14] Firms that have been able to issue bonds in international markets have been those that have maintained contact with domestic banks. This should also mitigate the refinancing risk.

[15] The current ratio is defined as current (liquid) assets to total liabilities. As a measure of liquidity this ratio should preferably be comfortably above unity.

[16] The interest coverage ratio is defined as EBIT (earnings before interest and taxes) over interest expenses.

Profitability

28. **Overall, despite a few very profitable companies, the listed companies seem to have a rather low level of profitability**:

- The Worldscope data shows that Mexican companies had one of the lowest median operating margins in Latin America and typically lower than in Asian countries, with the exception of Korea.

- On average, the return on assets (ROA) calculated on the BMV sample was about 4.6 percent and the return on equity (ROE) 10 percent in 2001, a relatively low level even taking into account the recession.[17]

29. **The gross margin and operating profit[18] for all BMV firms was on average higher, however, partly reflecting the fact that the largest firms are the most profitable** (as it is clear also from the sample of the top 25 firms), partly due to their high market share and concentrated markets in which they operate.[19] It is noticeable that despite the recession margins did not fall significantly in 2001, indicating that quoted firms overall are not very exposed to cyclical sectors. The top 25 firms had higher margins on average than all the BMV firms, but the median was lower.

D. Stress Tests

30. **This section attempts to assess the sensitivity of the corporate sector to potential adverse events**, such as a sharp drop in the exchange rate, a sustained increase in interest rates, a prolonged closure of international capital markets, and a downturn in demand. It builds on the analysis presented in the previous sections and attempts to evaluate the risk of large-scale losses in the corporate sector on the basis of a combination of shocks. Often, different types of adverse developments occur at the same time. For example, a sharp depreciation of the exchange rate is generally accompanied by a sharp increase in domestic interest rates and a slowdown in growth. It is the combined effect of negative shocks that may be critical for the health of the corporate and financial sectors: dwindling profits are unable to absorb large balance sheet losses and increased interest costs, leading to liquidity difficulties,

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[17] ROA and ROE are calculated as net profit over assets and over capital, respectively. It should be noted that net profits are quite volatile because they include foreign exchange losses/gains, as well as monetary losses/gains and other extraordinary items.

[18] Gross margins are calculated as the ratio of gross profits to sales, while operating margins are calculated as earnings before interest and taxes (EBIT) to sales.

[19] International comparison for the operating surplus (or gross margin) should be treated with caution, as it is affected by the value added content of production (i.e., firms with lower value added products tend to have lower operating margins).

which in emerging markets may translate into solvency problems. Liquidity concerns may also work together with solvency problems to the extent that weak companies are the ones that are most likely to experience liquidity problems as investors and creditors start having doubts about companies' ability to honor their debt.

31. **The tests assess the risk of default in the case of combined adverse shocks in the top 30 firms,[20] using end-2001 individual company data.** The use of company-specific data is important since different companies do not typically share their credit risk: large gains for a company do not prevent the default of another with large losses unless the two companies are closely integrated. Thus, disaggregated data on potential company losses in stress situations are needed in order to evaluate the extent of potential systemic repercussions, e.g., through large losses on banks' loan books, or a chain reaction in corporate bond markets.

32. Two series of tests were performed:

- **The first series of tests assessed the balance sheet effects of a sharp movement in the foreign exchange rate, interest rates, and sales.** The balance sheet loss from a combination of shocks was then compared to each company's end-2001 accounting capital in order to identify the risk for technical insolvency, defined as a loss larger than accounting capital.

- **The second series of tests assessed the potential liquidity effects of a combination of adverse shocks**. These tests attempted to assess the risk of a serious liquidity squeeze if market conditions were to prevent the full rollover of maturing debt in the context of an exchange rate depreciation, an increase in domestic and foreign interest rates, and/or reduced growth. A company was considered to be illiquid if its available cash flow (net profits plus non-cash deductibles such as depreciation) and available finance was insufficient to cover maturing debt.

33. **While both tests may be relevant in a crisis situation, companies generally fail because of a lack of liquid funds and only rarely due to a massive shock that jeopardizes its long-term solvency**. Moreover, as noted above it is hard to distinguish liquidity and solvency problems since companies that are close to being insolvent are also the ones that are most likely to be hardest hit by reduced liquidity. In performing a liquidity test, however, it is necessary to make a series of assumptions concerning the availability of finance, expressed in the rollover ratio of short-term debt, that are only imperfectly based on previous crisis periods.

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[20] These 30 companies include the top 25 and the remaining 5 companies are large companies, so that the sample of 30 companies is a cross section between the 25 largest companies by assets quoted on the BMV and the 25 companies most heavily indebted in foreign exchange.

34. The shocks were calibrated using historical observations of the exchange rate, interest rates, and the real growth in GDP. The standard deviation of the variables were calculated on the basis of percent changes in the exchange rate;[21] percentage point changes in the three-month treasury bill rate (expressed as annual rates),[22] and the annual growth rate of GDP. All observations covered January 1997 through December 2001. The use of standard deviations ensures some kind of normalization of the shocks. It can also be shown that regardless of the stochastic distribution of the series, the probability of an observation more than 1 standard deviation away from the mean is smaller than 50 percent. In the case of two independent variables the probability falls to below 25 percent (and for three the probability is less than 6.3 percent).[23]

35. **The stress tests presented in Table 8 suggest that Mexican companies would be able to withstand even large adverse developments in the exchange, interest rates, and sales, as long as capital markets are willing to roll over their debt.** In solvency terms, a combined shock of eight standard deviations would be needed to have any significant impact on the companies' technical solvency ratios. Such a shock has a probability of less than 1.6 percent to occur in any given year.[24]

36. **The liquidity test shows that, combined with an adverse exchange rate and interest shock of one standard deviation, the overall debt rollover ratio would have to fall to 60 percent before any major defaults of the magnitude that is likely to have systemic repercussions would occur.** The liquidity test was thus run for a range of values which permits us to gauge the sensitivity of the companies to deteriorating market conditions. While a reduction in the rollover ratio to 60 percent may not likely occur for all companies and in all markets simultaneously, several companies may, however, be subject to such a rollover squeeze if they are also subject to more fundamental difficulties affecting their solvency or sector-specific events.

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[21] The resulting standard deviation was annualized, reflecting the assumption that the nominal exchange rate follows approximately "a random walk."

[22] Please note that the standard deviation of the nominal interest rates was based on the first difference of the nominal interest rate, which removes the downward trend in the series. The estimate of the population standard deviation may, however, still be (upward) biased as a few sharp spikes during the Russia crisis may disproportionally affect the calculated standard deviation.

[23] The assumption of independence of the shocks, however, is likely to be violated, in particular in crisis situations, as a sharp fall in the exchange rate is generally accompanied by an increase in interest rates, and a contraction in output. The probability may thus be somewhat higher than suggested by the theory.

[24] By the Chebyschev inequality, for any well-defined probability function, the probability of an outcome of more than k-standard deviations from the means is less than $1/k^2$.

Table 8. Mexico: Corporate Sector Stress Tests
(In millions of U.S. dollars, unless otherwise indicated)

	Number of companies technically insolvent or illiquid	Aggregate size of technical default	Total accounting capital of comp's in technical default	Gross debt of comp's in technical default	Gross debt of comp's in technical default, in percent of GDP
Solvency tests					
One-standard deviation (STD)	0	0	0	0	0
Exchange rate and interest rates shocks	0	0	0	0	0
As above but also including growth shock	0	0	0	0	0
Eight-standard deviations					
Exchange rate, interest rates, and growth shocks	2	203	1,143	3,880	0.6
Liquidity tests					
Exchange rate shock (2 STD)	2	194	695	2,670	0.3
Interest rate shock (2 STD)	2	269	695	2,670	0.3
Exchange rate and interest rate shock (1 STD)	2	224	695	2,670	0.4
As above but also including growth shock	2	229	695	2,670	0.4
As above but rollover at only 80 percent	3	676	756	3,404	0.6
As above but rollover at only 60 percent	10	2,195	11,835	28,641	4.6
As above but rollover at only 40 percent	17	4,023	14,011	31,929	5.2
As above but rollover at only 20 percent	19	7,028	22,310	41,307	6.7

Sources: Mexican Stock Exchange (BMV); and Fund staff estimates.

E. Conclusions

37. **The Mexican corporate sector is highly segmented, with access to bond and bank financing available almost exclusively to top-tier companies**, which enjoy significant market power in highly concentrated markets.

38. **The vulnerability analysis conducted in this chapter suggests that the overall financial health of the corporate sector is relatively good** and hence, that the external payments difficulties recently experienced by some companies are sector- and company-specific. Leverage is low on average, although the top 25 firms have significantly higher leverage. The maturity structure of debt relatively comfortable, even though the currency composition of debt is highly skewed toward foreign currency, especially for long-term debt. The aggregate net foreign exchange position appears manageable. Liquidity indicators are adequate, while profitability is relatively low, even though this partly reflects cyclical developments.

39. **Nevertheless, disaggregated data pointed to significant differences across companies. In particular, some second-tier companies are significantly more leveraged, and exposed to foreign exchange developments (especially small exporters) and refinancing risks than the average company**. Some of them are also more sensitive to the business cycle and hence, their earnings have suffered noticeably because of the recession,

while the overall market and the majority of the top-tier firms are not very sensitive to the business cycle. Further, **a more detailed analysis of the net foreign exchange position is hampered by the lack of information on the composition and hence the liquidity of foreign exchange assets, and on the foreign exchange risk/hedge resulting from derivative operations.**

40. **The main conclusion from the stress tests is that the large Mexican corporations appear to be relatively robust to even a combination of a sharp drop in the exchange rate, a sustained large increase in interest rates, and a sharp slowdown in growth.** Technical insolvency of a significant proportion of the quoted companies requires a very dramatic combination of shocks. The risk of liquidity difficulties, which could turn into default, would, however, be significantly larger if—in addition to an adverse shock to the exchange rate and interest rates—the rollover ratio of maturing debt were to fall significantly, especially if a large part of the companies' foreign exchange assets turned out not to be readily marketable.

41. **Passage of a new Securities Markets Law in 2001 represents a significant step forward** and has significantly improved the regulatory environment in the BMV by enhancing corporate governance, even though some provisions of the new law fall short of international best practices. The real test of the new law will be in its practical application and in its effectiveness in improving minority shareholders' rights. The development of domestic institutional investors should help in enforcing the discipline that the new law establishes.

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APPENDIX I

Mexico: Total Debt to Common Equity 1/
(Indicator of Leverage)

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
						Western Hemisphere					
1st Quartile	Canada	35	34	17	18	22	15	18	17	20	17
Median	Canada	75	73	66	57	59	46	49	58	52	55
3rd Quartile	Canada	145	134	123	116	115	103	94	103	113	117
No. of Firms	Canada	109	111	119	123	146	162	172	182	196	190
1st Quartile	Argentina	12	12	16	23	19	18	25	33	17	23
Median	Argentina	17	18	27	48	49	37	48	63	62	65
3rd Quartile	Argentina	22	28	58	55	70	55	69	80	95	91
No. of Firms	Argentina	11	15	18	21	20	26	29	33	36	33
1st Quartile	Brazil	16	17	13	11	13	27	15	19	25	30
Median	Brazil	32	32	22	20	25	41	37	42	57	58
3rd Quartile	Brazil	47	54	42	34	47	57	68	80	106	87
No. of Firms	Brazil	22	22	24	29	33	38	49	51	56	57
1st Quartile	Chile	12	12	17	12	10	8	18	26	21	41
Median	Chile	46	39	33	25	37	37	37	35	52	67
3rd Quartile	Chile	61	51	44	42	66	54	60	85	88	110
No. of Firms	Chile	20	21	24	25	27	30	34	33	36	33
1st Quartile	Mexico	9	18	17	29	26	17	17	13	15	14
Median	Mexico	45	51	41	48	43	34	43	45	45	43
3rd Quartile	Mexico	72	69	76	121	94	76	80	90	85	97
No. of Firms	Mexico	27	34	38	39	43	47	48	53	58	55
						South East Asia					
1st Quartile	Australia	9	8	12	14	9	10	15	19	18	22
Median	Australia	37	35	38	38	39	37	44	49	46	52
3rd Quartile	Australia	70	72	64	59	59	65	76	81	76	79
No. of Firms	Australia	65	70	72	77	92	101	104	120	128	130
1st Quartile	New Zealand	54	25	28	23	24	15	15	17	27	28
Median	New Zealand	61	78	55	53	39	34	40	55	49	56
3rd Quartile	New Zealand	136	109	100	89	73	95	73	71	68	108
No. of Firms	New Zealand	11	13	13	20	27	32	32	33	34	36
1st Quartile	Indonesia	26	35	52	17	43	50	41	1	1	2
Median	Indonesia	37	55	88	75	99	100	123	97	75	48
3rd Quartile	Indonesia	80	133	100	131	153	158	226	257	190	116
No. of Firms	Indonesia	10	10	13	14	22	25	26	27	27	26
1st Quartile	Malaysia	1	1	0	2	2	1	4	10	5	12
Median	Malaysia	20	16	19	21	26	32	48	42	32	45
3rd Quartile	Malaysia	62	57	47	68	77	85	102	158	160	167
No. of Firms	Malaysia	44	46	50	52	61	66	70	72	73	71
1st Quartile	Philippines	15	4	17	11	14	30	46	38	29	30
Median	Philippines	43	26	27	29	36	53	52	57	45	54
3rd Quartile	Philippines	91	77	78	54	62	78	103	80	88	107
No. of Firms	Philippines	10	11	13	17	26	28	28	28	28	30
1st Quartile	South Korea	129	135	119	118	135	119	146	127	58	47
Median	South Korea	233	242	188	200	218	253	345	196	112	113
3rd Quartile	South Korea	400	488	305	304	308	377	666	341	161	170
No. of Firms	South Korea	29	31	41	44	46	53	59	58	66	73
1st Quartile	Thailand	57	98	64	30	63	88	173	122	43	46
Median	Thailand	159	156	100	89	95	123	302	191	144	129
3rd Quartile	Thailand	192	210	177	146	166	171	522	304	336	272
No. of Firms	Thailand	9	12	19	22	27	30	30	30	30	29

Source: Worldscope.

1/ In percent.

APPENDIX II

Mexico: Short-Term Debt to Total Debt 1/
Indicator of Vulnerability to Temporary Cut-off from Financing
(In combination with leverage)

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
						Western Hemisphere					
Mean	Canada	19.1	20.5	17.9	20.2	21.6	21.9	20.3	20.7	18.3	23.1
Median	Canada	15.3	15.2	9.9	12.1	13.9	11.0	10.8	9.4	8.8	11.5
3rd Quartile	Canada	27.1	24.5	25.0	26.4	28.9	33.1	27.4	25.3	25.1	31.9
No. of Firms	Canada	105	105	108	115	132	148	159	164	178	163
Mean	Argentina	51.1	51.1	50.6	51.2	52.9	48.9	41.8	46.1	49.5	49.4
Median	Argentina	45.0	52.4	44.0	43.3	44.5	33.2	28.6	35.3	42.5	44.2
3rd Quartile	Argentina	79.3	73.1	78.5	75.1	78.9	87.2	66.7	72.1	70.6	62.9
No. of Firms	Argentina	11	14	17	21	20	26	29	31	33	30
Mean	Brazil	54.3	52.3	43.7	38.1	47.2	45.9	39.9	41.4	46.1	37.7
Median	Brazil	47.9	49.5	40.1	35.8	45.4	43.0	38.3	42.4	42.6	34.9
3rd Quartile	Brazil	69.7	71.6	57.5	54.2	66.2	57.8	48.4	51.5	57.8	46.4
No. of Firms	Brazil	22	22	24	27	33	38	49	50	54	55
Mean	Chile	30.5	32.6	36.1	31.0	33.2	30.0	32.6	31.8	27.8	30.0
Median	Chile	20.1	27.2	21.3	23.8	26.3	21.1	25.1	21.4	18.1	25.3
3rd Quartile	Chile	31.7	44.2	38.0	33.6	38.4	33.5	44.6	52.6	36.0	37.0
No. of Firms	Chile	19	20	24	25	26	29	33	32	36	32
Mean	Mexico	57.0	43.0	40.1	41.2	47.3	37.8	31.3	32.1	36.4	37.0
Median	Mexico	57.4	36.7	41.4	39.8	38.9	26.6	24.4	24.4	26.6	26.5
3rd Quartile	Mexico	83.0	64.6	52.0	54.0	73.0	58.5	39.1	47.0	48.7	53.3
No. of Firms	Mexico	25	32	36	38	41	43	44	47	52	47
						South East Asia					
Mean	Australia	29.0	26.9	25.1	22.3	21.7	22.0	23.7	19.3	19.2	19.7
Median	Australia	21.2	18.8	16.2	9.3	12.0	10.8	9.8	6.7	6.5	7.3
3rd Quartile	Australia	35.0	34.2	33.0	29.4	29.8	30.2	32.9	25.5	25.5	29.8
No. of Firms	Australia	60	67	66	71	79	91	96	113	120	122
Mean	New Zealand	24.9	37.4	28.5	28.2	24.2	25.1	18.9	23.4	26.2	25.1
Median	New Zealand	26.1	23.5	22.8	9.3	10.4	5.4	7.9	9.9	5.2	4.2
3rd Quartile	New Zealand	30.2	75.7	53.9	41.2	34.0	27.5	22.7	21.1	37.4	46.7
No. of Firms	New Zealand	11	13	12	18	24	29	29	32	32	33
Mean	Indonesia	65.4	65.9	54.2	48.2	39.0	45.5	48.0	50.5	51.9	48.6
Median	Indonesia	70.2	77.8	41.9	38.1	24.7	31.7	39.2	34.3	41.5	30.6
3rd Quartile	Indonesia	98.1	99.0	89.9	66.2	66.0	89.4	79.9	99.5	99.0	98.5
No. of Firms	Indonesia	10	10	13	14	22	25	26	25	23	23
Mean	Malaysia	64.6	64.2	59.9	63.7	62.6	55.5	46.6	49.6	52.8	48.5
Median	Malaysia	70.8	72.0	68.8	74.2	75.8	51.4	37.8	44.3	48.9	41.9
3rd Quartile	Malaysia	98.7	97.5	94.6	99.5	99.3	94.7	86.9	84.4	88.2	82.8
No. of Firms	Malaysia	33	36	38	43	51	53	57	60	63	62
Mean	Philippines	52.9	37.8	45.1	41.0	48.1	46.0	40.8	36.5	36.6	42.8
Median	Philippines	57.3	34.9	38.9	30.2	37.0	44.5	38.9	27.9	25.4	41.2
3rd Quartile	Philippines	72.5	43.6	55.4	60.1	81.7	65.9	55.0	54.4	56.7	60.5
No. of Firms	Philippines	9	9	12	15	23	26	26	27	26	26
Mean	South Korea	51.9	54.9	54.8	55.5	58.4	54.1	54.1	50.0	50.9	54.9
Median	South Korea	53.6	54.0	52.4	53.6	58.5	56.1	55.3	51.5	49.1	54.4
3rd Quartile	South Korea	60.3	60.8	58.4	64.4	71.0	68.3	63.2	60.2	62.6	70.9
No. of Firms	South Korea	28	30	41	44	46	52	58	56	64	67
Mean	Thailand	46.8	40.8	24.3	35.7	29.8	34.8	31.1	40.8	37.6	36.1
Median	Thailand	39.1	33.2	13.0	26.6	22.8	23.8	27.3	34.2	26.2	16.8
3rd Quartile	Thailand	68.5	56.0	37.9	58.8	37.8	45.8	42.8	57.9	55.3	57.0
No. of Firms	Thailand	9	12	18	22	27	30	29	30	29	27

Source: Worldscope.

1/ In percent.

Mexico: Current Ratio (Current Assets to Total Liabilities) 1/
Indicator of Liquidity

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
						Western Hemisphere					
1st Quartile	Canada	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.0	1.0	1.0
Median	Canada	1.4	1.6	1.5	1.6	1.5	1.6	1.7	1.6	1.5	1.4
3rd Quartile	Canada	2.1	2.1	2.2	2.3	2.4	2.4	2.4	2.5	2.4	2.5
No. of Firms	Canada	105	107	115	119	138	150	160	169	182	174
1st Quartile	Argentina	1.2	0.9	0.7	0.7	0.7	0.7	0.8	0.8	0.7	0.7
Median	Argentina	1.6	1.6	1.4	1.0	1.0	1.3	1.2	1.1	1.1	0.9
3rd Quartile	Argentina	1.9	2.1	1.6	1.8	1.5	1.7	2.1	1.9	1.6	1.6
No. of Firms	Argentina	11	14	17	20	19	25	27	30	32	32
1st Quartile	Brazil	0.5	0.5	0.8	0.9	0.8	0.7	0.7	0.7	0.7	0.9
Median	Brazil	0.9	0.8	1.1	1.2	1.2	1.0	1.1	1.0	1.0	1.2
3rd Quartile	Brazil	1.2	1.3	1.3	1.7	1.7	1.6	1.5	1.3	1.3	1.5
No. of Firms	Brazil	22	22	24	28	32	37	48	50	55	56
1st Quartile	Chile	1.5	1.2	1.3	1.3	1.0	1.2	1.2	0.9	1.0	1.1
Median	Chile	1.6	1.9	1.9	2.2	1.5	1.7	1.6	1.3	1.9	1.8
3rd Quartile	Chile	2.3	2.6	3.6	3.3	2.9	2.5	2.2	2.6	2.7	2.5
No. of Firms	Chile	20	21	24	25	26	28	31	31	34	33
1st Quartile	Mexico	1.1	1.2	1.2	1.0	0.9	1.2	1.3	1.2	1.2	1.1
Median	Mexico	1.7	1.6	1.6	1.4	1.3	1.6	1.8	1.6	1.7	1.5
3rd Quartile	Mexico	2.1	2.5	2.8	1.8	2.0	2.5	2.9	2.8	2.4	2.3
No. of Firms	Mexico	27	34	38	39	42	45	47	51	55	55
						South East Asia					
1st Quartile	Australia	1.1	1.2	1.0	1.1	1.1	1.1	1.0	1.0	1.1	1.0
Median	Australia	1.5	1.5	1.4	1.3	1.4	1.4	1.3	1.3	1.3	1.3
3rd Quartile	Australia	1.8	1.7	1.6	1.7	1.9	1.8	1.7	1.8	1.7	1.7
No. of Firms	Australia	53	58	60	63	74	79	81	93	98	101
1st Quartile	New Zealand	1.1	0.8	0.9	0.9	1.0	0.9	0.7	0.7	0.6	0.8
Median	New Zealand	1.2	1.1	1.1	1.1	1.2	1.1	0.9	1.0	1.0	1.1
3rd Quartile	New Zealand	1.9	1.5	1.9	1.7	2.0	1.6	1.4	1.6	1.6	1.6
No. of Firms	New Zealand	11	13	13	20	25	28	29	30	31	32
1st Quartile	Indonesia	1.2	1.0	0.8	1.2	1.3	1.1	0.9	0.8	1.1	1.3
Median	Indonesia	1.8	1.3	1.2	1.3	1.5	1.6	1.4	1.3	1.8	1.9
3rd Quartile	Indonesia	3.0	1.7	1.6	2.1	2.3	1.9	2.0	2.3	2.5	2.7
No. of Firms	Indonesia	10	10	13	14	21	24	25	26	26	25
1st Quartile	Malaysia	0.9	0.9	1.2	1.0	1.1	1.0	1.1	0.8	0.9	1.0
Median	Malaysia	1.2	1.2	1.4	1.4	1.4	1.4	1.5	1.3	1.5	1.5
3rd Quartile	Malaysia	1.6	1.9	1.8	1.9	2.0	2.3	2.3	2.1	2.4	2.5
No. of Firms	Malaysia	40	42	44	46	56	58	62	65	66	65
1st Quartile	Philippines	1.2	1.4	1.3	1.5	1.3	1.0	1.0	1.0	1.0	1.1
Median	Philippines	1.4	1.8	1.7	2.2	1.7	1.5	1.3	1.2	1.2	1.2
3rd Quartile	Philippines	1.5	2.2	1.7	3.1	3.0	2.4	1.8	1.6	1.9	1.5
No. of Firms	Philippines	7	8	9	12	19	21	21	20	20	23
1st Quartile	South Korea	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.6
Median	South Korea	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
3rd Quartile	South Korea	1.0	1.0	1.1	1.0	1.1	1.1	1.0	1.1	1.3	1.3
No. of Firms	South Korea	28	29	39	41	42	48	54	53	61	67
1st Quartile	Thailand	1.0	0.8	0.8	0.9	1.0	0.8	0.6	0.5	0.7	0.9
Median	Thailand	1.2	0.9	1.2	1.4	1.3	1.4	0.9	0.8	1.0	1.3
3rd Quartile	Thailand	2.4	1.2	1.9	1.7	2.0	2.1	1.5	1.4	1.8	2.3
No. of Firms	Thailand	8	11	18	21	26	29	29	29	29	28

Source: Worldscope.

1/ Number of times.

Mexico: EBITDA (Earnings Before Interest, Taxes, and Depreciation) to Interest Expense on Debt 1/
Indicator of General Financial Soundness

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
						Western Hemisphere					
1st Quartile	Canada	2	2	3	4	4	4	3	3	3	4
Median	Canada	4	4	5	6	16	7	8	6	7	7
3rd Quartile	Canada	7	8	12	12	13	17	16	11	11	13
No. of Firms	Canada	103	106	110	113	133	147	156	164	173	158
1st Quartile	Argentina	0	6	7	7	4	3	4	3	2	2
Median	Argentina	3	13	9	9	7	6	6	7	4	4
3rd Quartile	Argentina	5	27	17	30	10	11	16	13	7	11
No. of Firms	Argentina	9	13	15	20	17	23	26	29	31	31
1st Quartile	Brazil	0	1	1	3	4	2	2	2	1	2
Median	Brazil	1	2	2	6	8	4	4	3	2	3
3rd Quartile	Brazil	2	3	7	12	10	8	11	5	4	5
No. of Firms	Brazil	20	20	23	23	29	35	46	48	53	56
1st Quartile	Chile	5	5	5	8	5	5	4	3	4	4
Median	Chile	11	13	14	12	9	9	9	7	5	5
3rd Quartile	Chile	25	23	23	18	13	16	15	11	13	9
No. of Firms	Chile	20	21	24	25	26	28	33	32	34	31
1st Quartile	Mexico	3	3	3	1	2	3	3	2	4	3
Median	Mexico	7	4	4	2	3	5	5	4	5	6
3rd Quartile	Mexico	13	11	6	6	5	6	7	10	13	17
No. of Firms	Mexico	19	28	30	33	35	35	38	42	50	49
						South East Asia					
1st Quartile	Australia	3	4	5	6	5	5	4	4	4	4
Median	Australia	5	6	8	8	8	8	7	7	6	6
3rd Quartile	Australia	13	11	17	16	17	15	14	11	11	11
No. of Firms	Australia	59	63	66	69	83	89	94	107	117	122
1st Quartile	New Zealand	2	2	3	3	6	4	4	4	4	4
Median	New Zealand	3	4	8	10	11	6	7	6	6	6
3rd Quartile	New Zealand	5	11	13	17	19	12	13	12	12	9
No. of Firms	New Zealand	11	13	13	19	24	30	30	32	33	32
1st Quartile	Indonesia	5	4	4	4	3	3	0	1	3	1
Median	Indonesia	11	5	6	6	5	4	3	2	4	3
3rd Quartile	Indonesia	33	7	14	14	12	10	5	5	8	10
No. of Firms	Indonesia	8	8	10	14	22	25	25	26	24	21
1st Quartile	Malaysia	6	5	5	7	6	6	5	2	2	4
Median	Malaysia	12	12	12	15	16	15	11	7	8	8
3rd Quartile	Malaysia	66	39	57	67	87	70	48	15	17	24
No. of Firms	Malaysia	37	39	43	46	54	56	58	59	59	60
1st Quartile	Philippines	4	5	4	5	6	4	3	3	4	2
Median	Philippines	5	6	6	9	8	9	6	4	5	4
3rd Quartile	Philippines	7	13	9	12	24	15	11	7	8	9
No. of Firms	Philippines	7	7	10	11	15	17	20	19	20	25
1st Quartile	South Korea	2	2	2	2	2	1	1	1	2	1
Median	South Korea	3	3	2	3	2	2	2	2	3	2
3rd Quartile	South Korea	4	3	4	4	4	3	2	3	4	8
No. of Firms	South Korea	7	8	18	18	43	49	56	55	64	69
1st Quartile	Thailand	4	4	3	3	3	2	1	2	1	1
Median	Thailand	7	11	4	5	5	4	2	3	3	3
3rd Quartile	Thailand	22	13	6	7	8	6	5	5	6	9
No. of Firms	Thailand	8	9	16	21	26	29	30	30	30	28

Source: Worldscope.

1/ Number of times.

Mexico: EBITA (Earnings Before Interest and Taxes minus Income and Other Taxes) to Sales 1/
Indicator of Profitability

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
						Western Hemisphere					
1st Quartile	Canada	0.03	0.03	0.03	0.05	0.05	0.04	0.04	0.03	0.05	0.04
Median	Canada	0.05	0.06	0.06	0.09	0.09	0.10	0.08	0.08	0.09	0.09
3rd Quartile	Canada	0.15	0.16	0.16	0.15	0.16	0.18	0.18	0.15	0.17	0.17
No. of Firms	Canada	107	109	116	121	146	160	169	176	192	177
1st Quartile	Argentina	-0.05	0.04	0.05	0.08	0.08	0.09	0.10	0.09	0.05	0.04
Median	Argentina	0.09	0.10	0.12	0.11	0.14	0.15	0.17	0.15	0.14	0.11
3rd Quartile	Argentina	0.17	0.15	0.20	0.16	0.22	0.26	0.23	0.24	0.22	0.19
No. of Firms	Argentina	10	14	18	21	18	25	28	32	34	32
1st Quartile	Brazil	-0.14	0.06	0.09	0.07	0.05	0.08	0.11	0.08	0.05	0.10
Median	Brazil	0.13	0.11	0.12	0.10	0.10	0.13	0.21	0.17	0.12	0.16
3rd Quartile	Brazil	0.35	0.23	0.19	0.19	0.15	0.18	0.28	0.26	0.23	0.23
No. of Firms	Brazil	20	20	23	23	29	35	47	50	54	55
1st Quartile	Chile	0.16	0.18	0.16	0.16	0.15	0.14	0.12	0.12	0.08	0.09
Median	Chile	0.23	0.23	0.26	0.22	0.25	0.24	0.15	0.18	0.16	0.16
3rd Quartile	Chile	0.38	0.42	0.34	0.36	0.35	0.36	0.34	0.31	0.22	0.26
No. of Firms	Chile	20	21	24	25	27	30	34	33	36	33
1st Quartile	Mexico	0.06	0.10	0.10	-0.02	0.10	0.12	0.10	0.08	0.08	0.06
Median	Mexico	0.17	0.16	0.14	0.04	0.15	0.21	0.17	0.11	0.14	0.10
3rd Quartile	Mexico	0.22	0.22	0.19	0.11	0.22	0.27	0.24	0.18	0.20	0.18
No. of Firms	Mexico	21	29	31	34	35	36	39	44	50	54
						South East Asia					
1st Quartile	Australia	0.06	0.05	0.06	0.05	0.06	0.06	0.06	0.04	0.05	0.05
Median	Australia	0.10	0.10	0.10	0.10	0.11	0.13	0.12	0.10	0.12	0.13
3rd Quartile	Australia	0.19	0.16	0.19	0.24	0.24	0.31	0.33	0.29	0.28	0.33
No. of Firms	Australia	60	67	70	74	86	93	97	115	124	124
1st Quartile	New Zealand	0.07	0.06	0.06	0.07	0.09	0.08	0.09	0.07	0.06	0.07
Median	New Zealand	0.10	0.09	0.10	0.12	0.15	0.15	0.14	0.13	0.13	0.14
3rd Quartile	New Zealand	0.15	0.13	0.13	0.24	0.26	0.26	0.26	0.25	0.30	0.31
No. of Firms	New Zealand	11	13	13	20	26	32	32	33	35	35
1st Quartile	Indonesia	0.10	0.10	0.08	0.08	0.13	0.17	0.10	-0.03	0.11	0.02
Median	Indonesia	0.19	0.16	0.18	0.19	0.24	0.24	0.20	0.13	0.18	0.11
3rd Quartile	Indonesia	0.36	0.26	0.22	0.23	0.27	0.29	0.29	0.31	0.28	0.21
No. of Firms	Indonesia	9	9	11	14	22	25	26	26	25	21
1st Quartile	Malaysia	0.09	0.08	0.07	0.09	0.08	0.09	0.08	0.04	0.06	0.07
Median	Malaysia	0.11	0.13	0.12	0.13	0.12	0.14	0.15	0.13	0.20	0.14
3rd Quartile	Malaysia	0.16	0.18	0.18	0.21	0.21	0.22	0.25	0.25	0.32	0.28
No. of Firms	Malaysia	41	43	48	50	57	62	66	68	70	68
1st Quartile	Philippines	0.11	0.09	0.07	0.10	0.13	0.16	0.12	0.11	0.11	0.09
Median	Philippines	0.25	0.19	0.22	0.28	0.27	0.33	0.23	0.20	0.18	0.17
3rd Quartile	Philippines	0.34	0.35	0.36	0.40	0.38	0.45	0.39	0.33	0.32	0.26
No. of Firms	Philippines	9	10	11	15	24	27	24	22	23	27
1st Quartile	South Korea	0.06	0.06	0.05	0.05	0.05	0.04	0.03	0.06	0.06	0.03
Median	South Korea	0.07	0.08	0.07	0.08	0.08	0.06	0.05	0.09	0.10	0.07
3rd Quartile	South Korea	0.09	0.09	0.10	0.11	0.10	0.09	0.07	0.13	0.14	0.13
No. of Firms	South Korea	25	27	40	42	44	50	56	55	65	72
1st Quartile	Thailand	0.14	0.12	0.06	0.11	0.13	0.11	0.04	0.09	0.03	0.05
Median	Thailand	0.15	0.14	0.12	0.16	0.22	0.17	0.16	0.40	0.11	0.13
3rd Quartile	Thailand	0.31	0.18	0.22	0.27	0.39	0.30	0.25	0.71	0.28	0.27
No. of Firms	Thailand	8	10	17	22	27	30	30	30	30	29

Source: Worldscope.

1/ Number of times.

II. Private Sector Financing in Mexico[1]

A. Introduction

1. Despite the banking sector's substantial consolidation and strengthening of the last seven years,[2, 3] **bank credit to the private sector has declined consistently in real terms since the Tequila crisis.** On one hand, this resulted from banks' efforts to strengthen their balance sheets and gradually eliminate the burden of nonperforming and restructured loans. On the other hand, demand for credit has also declined as enterprises restructured and strengthened their own balance sheets to reduce leverage. In addition, the weak functioning of the judicial system has limited creditors' ability to collect even on collateralized loans, which further discouraged credit provision. Notwithstanding the dearth of bank lending, the economy was able to grow at a rapid pace between 1997 and 2000, with the private sector relying on alternative sources of financing (namely suppliers' credits, foreign funds, and nonbank lending, as well as on internally generated funds such as retained earnings).

2. **This paper reviews recent developments in credit to the private sector and the increasing role of institutional investors.** It assesses whether prospects for private sector financing are likely to differ from the recent historical pattern and concludes that conditions are now favorable for a resumption of bank credit, as well as for the development of domestic capital markets. The recent sizable issuance of corporate bonds indicates that going forward the domestic debt market is likely to play a significant role. However, some areas are identified where further progress would be desirable to increase the funds available for private sector development.

3. The rest of the paper is organized as follows. Section B reviews the evolution of credit to the private sector in the last seven years and describes the main providers of credit. Section C examines firms' financing sources. Section D reviews credit to households. Section E looks at recent regulatory changes that could affect private sector credit and Section F concludes by assessing prospects for a resumption of credit to the private sector.

B. Evolution of Credit to the Private Sector in Mexico

4. **Overall credit to the private sector declined from 62 percent of GDP in 1994 to 31 percent at end-2001** (Table 1). Until the Tequila crisis, banks had been the main source of credit to the private sector in Mexico. Since then, bank credit has declined considerably

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[1] Prepared by Juan Pablo Cordoba (WHD) and Laura Papi (ICM).

[2] Following the banking crisis of 1994–95, the government implemented various bank restructuring and debtor support programs that helped reestablish the solvency of the banking system and avoided losses to depositors. The Mexican banking system is currently considered to be well-capitalized and profitability has resumed.

[3] The FSAP for Mexico found that the banking system does not pose systemic risks and currently all banks except one comply with the 2003 risk-weighted capital requirements.

Table 1. Mexico: Evolution of Credit to the Private Sector 1994–2002

	1994	1995	1996	1997	1998	1999	2000	2001	QI 2002	QII 2002
					(In billions of pesos)					
Total financing to the private sector	**882**	**1,180**	**1,345**	**1,457**	**1,700**	**1,791**	**1,885**	**1,814**	**1,855**	**1,839**
Domestic credit	**739**	**953**	**1,093**	**1,157**	**1,272**	**1,309**	**1,314**	**1,222**	**1,259**	**1,192**
Bank credit	**642.7**	**826.4**	**934.5**	**942.7**	**990.6**	**953.6**	**881.2**	**801.6**	**767.1**	**775.4**
Consumption	48.4	43.0	36.5	35.5	36.1	38.6	48.8	65.0	67.0	72.0
Housing	103.1	167.9	215.7	241.7	258.8	256.0	212.5	183.1	180.1	179.0
Commercial 1/	491.2	615.6	682.4	665.6	695.8	659.1	619.9	553.5	520.1	524.3
Nonbank credit	**96.1**	**126.3**	**158.6**	**214.3**	**281.1**	**355.8**	**432.9**	**420.0**	**492.1**	**416.7**
Investment houses (SOFOLES)				15.5	27.4	42.8	62.1	83.1	87.5	96.9
Pension funds (SIEFORES)				0.1	1.7	2.7	9.3	21.0	27.3	35.2
Insurance companies 2/	17.6	19.2	23.0	23.8	25.5	33.3	35.8	38.4	39.6	
Credit unions	13.9	15.5	21.4	24.4	30.2	33.0	7.8	8.8	7.8	7.4
Other 3/	64.6	91.6	114.2	150.4	196.3	244.0	317.9	268.8	246.0	
Of which: mutual funds 4/								71.4	83.8	
Foreign credit	**143.4**	**227.7**	**251.8**	**300.5**	**428.1**	**481.5**	**570.6**	**592.0**	**595.9**	**646.8**
					(Average annual real percentage change)					
Total financing to the private sector		**-12.0**	**-10.8**	**-6.4**	**-1.7**	**-6.2**	**-3.4**	**-7.8**	**-10.2**	**-2.5**
Domestic credit		**-15.1**	**-10.1**	**-8.5**	**-7.3**	**-8.3**	**-7.9**	**-11.0**	**-13.5**	**-8.2**
Bank credit		**-15.4**	**-11.5**	**-12.8**	**-11.4**	**-14.3**	**-15.2**	**-12.9**	**-15.4**	**-11.5**
Consumption		-41.6	-33.6	-16.0	-14.2	-4.8	16.1	27.6	18.4	21.3
Housing		7.1	0.6	-3.2	-9.7	-11.9	-23.8	-17.5	-16.4	-10.8
Commercial 1/		-17.5	-13.2	-15.7	-11.9	-15.7	-13.7	-14.5	-18.0	-14.9
Nonbank credit		**-13.5**	**-1.6**	**16.7**	**10.6**	**12.7**	**11.7**	**-7.1**	**-9.9**	**-1.3**
Investment houses (SOFOLES)		0.0	0.0	0.0	48.6	39.2	33.0	28.2	28.0	33.2
Pension funds (SIEFORES)		0.0	0.0	0.0	2331.4	40.4	214.3	116.2	97.2	156.2
Insurance companies 2/		-28.3	-6.0	-10.6	-9.7	16.1	-1.4	2.7	2.2	n.a
Credit unions		-26.9	8.3	-1.3	4.1	-2.8	-78.2	7.2	3.1	-5.0
Other 3/		-6.6	-2.4	13.8	10.0	10.7	19.6	-19.0	-24.2	n.a.
Foreign credit		**4.5**	**-13.4**	**3.1**	**20.1**	**0.1**	**8.8**	**-0.6**	**-2.7**	**10.0**
					(In percent of GDP)					
Total financing to the private sector	**62.1**	**64.3**	**53.3**	**45.9**	**44.2**	**39.0**	**34.4**	**31.4**	**30.7**	**31.5**
Domestic credit	**52.0**	**51.9**	**43.3**	**36.4**	**33.1**	**28.5**	**24.0**	**21.2**	**20.4**	**20.4**
Bank credit	**45.3**	**45.0**	**37.0**	**29.7**	**25.8**	**20.8**	**16.1**	**13.9**	**13.3**	**13.3**
Consumption	3.4	2.3	1.4	1.1	0.9	0.8	0.9	1.1	1.2	1.2
Housing	7.3	9.1	8.5	7.6	6.7	5.6	3.9	3.2	3.1	3.1
Commercial 1/	34.6	33.5	27.0	21.0	18.1	14.3	11.3	9.6	9.0	9.0
Nonbank credit	**6.8**	**6.9**	**6.3**	**6.8**	**7.3**	**7.7**	**7.9**	**7.3**	**7.1**	**7.1**
Investment houses (SOFOLES)	0.0	0.0	0.0	0.5	0.7	0.9	1.1	1.4	1.5	1.7
Pension funds (SIEFORES)	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.6
Insurance companies 2/	1.2	1.0	0.9	0.8	0.7	0.7	0.7	0.7	0.7	n.a.
Credit unions	1.0	0.8	0.8	0.8	0.8	0.7	0.1	0.2	0.1	0.1
Other 3/	4.5	5.0	4.5	4.7	5.1	5.3	5.8	4.7	4.3	n.a.
Of which: mutual funds 4/	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1.2	1.5	n.a.
Foreign credit	**10.1**	**12.4**	**10.0**	**9.5**	**11.1**	**10.5**	**10.4**	**10.3**	**10.3**	**11.1**
Memorandum items:										
GDP (billions of pesos)	1420.2	1837.0	2525.6	3174.3	3846.4	4593.7	5485.4	5771.9	5762.5	5829.3
CPI inflation	7.1	52.0	27.7	15.7	18.6	12.3	9.0	4.4	4.7	4.9
Exchange rate (period average Mex$/US$)	3.4	6.5	7.6	7.9	9.1	9.4	9.4	9.2	9.1	9.5

Sources: Bank of Mexico; National Institute of Statistics and Geography (INEGI); and Fund staff calculations.

1/ Includes credit to enterprises and to individuals with commercial activity

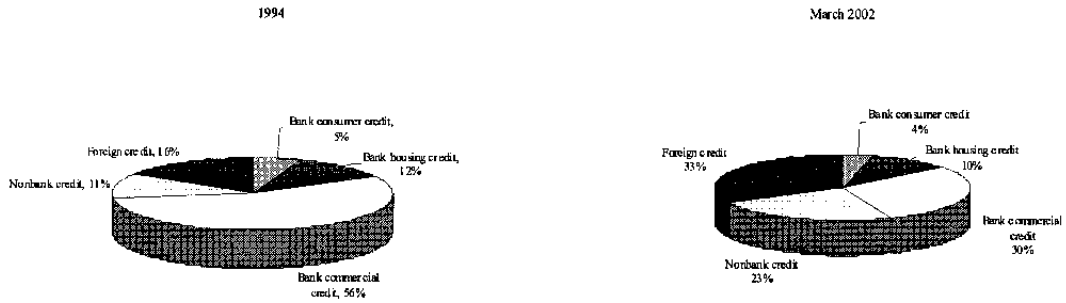
2/ Includes investment in private sector securities and loans.

3/ Includes leasing companies, factoring, savings and loans, development funds, stock brokers, reinsurance companies and "almacenes de depósito."

4/ Mutual funds were created in 1950 but its role in prividing credit to the private sector had been negligible until recently. Information before 2000 is not available in the same format.

in real terms, while nonbank and foreign financing have kept pace with real GDP growth and have increased significantly their share in private credit (Figure 1). Nonbank institutions have had strong growth in the last few years and are becoming important providers of credit to the private sector, at the same time fostering the development of domestic capital markets. The nonbank providers of credit are: non-deposit taking financial intermediaries with a limited objective (SOFOLES); mutual funds; pension funds (SIEFORES); insurance companies; credit unions; and other institutions, such as leasing and factoring firms, savings and loans cooperatives, brokerage houses and development trust funds.

Figure 1. Mexico: Composition of Credit to the Private Sector



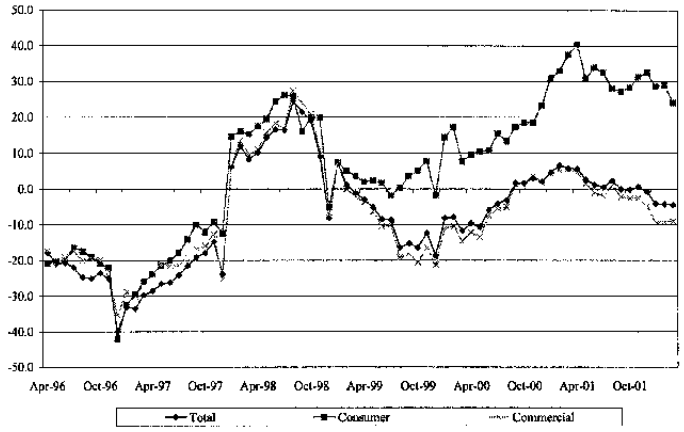
5. **Bank credit fell from 45 to 14 percent of GDP between 1994 and 2001 and bank commercial loans from 35 to 9.6 percent of GDP** (see Table 1). The sharp decline in bank credit was largely associated with banks' need to strengthen their balance sheets and absorb the losses associated with debt restructuring, as well as a decline in the demand for credit from the private sector. In addition, the large demand for resources from the public sector and the perception of a dearth of creditworthy private clients has made it easier and more cost effective for banks to concentrate on a few clients (the government and large corporations) than to take on additional credit risk via broad-based lending.[4] This trend was accentuated to some extent by the recent consolidation of the banking system (via mergers and purchases of domestic banks by foreign banks) which gave way to a further slowdown in credit growth while the banks adjust to their new corporate structure.[5] However, with increasing competition, and lower, more stable interest rates, banks are increasingly pressured to resume broad-based lending.

[4] Restructured loans absorb fresh bank funds because in some of these programs the government issued zero-coupon bonds which accrue income to the banks but do not provide liquid funds and, in other programs, banks have to write-off a portion of the asset on an annual basis as part of the loss-sharing agreements with the government.

[5] It has also been reported that when two banks merge the lines of credit to borrowers by the new institution are not necessarily equivalent to the individual lines that each bank had with that borrower which may result in a credit squeeze.

6. Except for a brief period in 1998 and the slow recovery in 2000–01, nonrestructured loans to the private sector (which better reflect credit trends) have also declined since the crisis, but the magnitudes of the decline are smaller (Figure 2).[6] The recovery observed in 2000–01 was largely due to commercial loans and the strong growth of consumer credit. In fact, consumer credit has registered strong growth since 1998 (over 12 percent on average in real terms), but it represents only a small share of total credit. In June 2002, commercial loans were down 6.9 percent in real terms from a year earlier. The recovery in credit in 1998 was accompanied by rapid economic growth, but this growth was halted after the Russia crisis in August of that year. Consumer credit recovered quickly after that, while the other forms of credit only rebounded in 2000 as economic activity gained momentum. Interestingly, the two sectors of the economy that have led growth in recent years have been those with access to credit—the export sector and, more recently, private consumption.

Figure 2. Mexico: Bank Credit to the Private Sector-Nonrestructured Loans
(Real growth rates)



7. **Nonbank credit to the private sector, on the other hand, registered strong growth since 1997.** Although pension funds, mutual funds, investment houses (*Sociedades Financieras de Objeto Limitado* or SOFOLES[7]), and insurance companies accounted for only 12 percent of total credit to the private sector at end-2001, these institutional investors are rapidly acquiring a prominent role in financing the corporate sector. During the last seven quarters to June 2002, the performing loan portfolio of the SOFOLES registered annual growth rates of over 25 percent in real terms. The total loan portfolio of SOFOLES amounted to 10 percent of the total loan portfolio of banks.

8. **Funds under management of local institutional investors have grown very briskly in the last few years**: pension funds grew 52 percent in 2001 alone, and mutual funds rose even more (Table 2). The combined stock of funds of domestic institutional

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[6] Nonrestructured bank loans to the private sector are a better indicator of banking sector credit activity because it excludes all credits associated to restructuring programs. The latter include restructurings via UDIs trust funds (trust funds in which debts were restructured and redenominated in inflation indexed instruments), discounts on payments absorbed by both the government and banks, or exchanged for bonds issued by the bank deposit insurance agency (*Instituto para la Protección al Ahorro Bancario*, IPAB) or its predecessor, FOBAPROA.

[7] SOFOLES are nondeposit taking financial instutions that fund themselves via loans provided by commercial banks, the Federal Housing Institution (*Sociedad Hipotecaria Federal*, SHF) and commercial paper placements.

Tables 2. Mexico: Domestic Institutional Investors 2000–01
Total Assets and Composition of Investment Portfolio

	In billions of pesos		In billions of dollars		Growth
	2000	2001	2000	2001	Rate
Total	**464.5**	**675.0**	**71.5**	**73.7**	**45.3**
Pension funds	**163.6**	**248.2**	**26.3**	**27.1**	**51.7**
Governmet bonds	149.0	218.0	23.1	23.8	46.3
Banks bonds	3.3	6.0	0.6	0.7	83.4
Private coporate bonds	8.9	19.3	2.0	2.1	118.0
Other	2.5	4.9	0.5	0.5	99.2
Mutual funds	**184.9**	**296.8**	**31.4**	**32.4**	**60.5**
Government bonds	89.4	180.6	19.1	19.7	102.1
Bank bonds	59.0	71.0	7.5	7.8	20.4
Private corporate bonds	12.4	12.8	1.4	1.4	3.3
Equity	22.4	30.2	3.2	3.3	34.7
Other	1.8	2.3	0.2	0.2	25.6
Insurance Companies	**116.0**	**130.0**	**13.8**	**14.2**	**12.0**
Government bonds	34.4	45.0	4.8	4.9	30.9
Bank bonds	18.1	19.6	2.1	2.1	8.5
Private corporate bonds	11.0	10.2	1.1	1.1	(6.9)
Other	52.6	55.1	5.8	6.0	4.9
Memorandum item:					
Exchange rate (period average Mex$/US$)	9.4	9.2	n.a.	n.a.	-2.1

Sources: CNBV, CONSAR, CNSF, and staff calculations.

investors amounted to US$74 billion at the end of 2001.[8] Furthermore, some Mex$40 billion (0.66 percent of GDP) enter the pension funds each year as new contributions, which in addition to a return on their total portfolio of about Mex$20 billion (0.3 percent of GDP), provides a total annual increase of Mex$60 billion (1 percent of GDP). The growth of mutual funds was spurred by the decline in interest rates, as investors searched for more lucrative opportunities and banks encouraged their clients to shift their funds from bank deposits to their own mutual funds.

9. **The growing importance of domestic institutional investors increases the potential investor base of long maturity paper, providing a source of long-term funds for enterprises**, thus far unavailable in Mexico. Typically, mutual funds invest in medium-term securities, while insurance companies and pension funds demand long-term bonds: these results from the maturity structure of their liabilities. The increasing role of institutional investors should help foster the development of the domestic financial markets, improve the transparency of these markets, and encourage better corporate governance of the issuers.[9]

10. **With the decline in interest rates since 2001 and the emergence of a market for long-term instruments, conditions are favorable for a recovery in credit growth**. The decline in interest rates has also led to a decline in the interest margin of banks which should gradually spur banks to seek higher returns by increasing credit to the private sector. The decline in rates has also increased the demand for credit from corporations. The combination of these factors plus the continued efforts by the authorities to improve the legal framework are likely to facilitate the recovery of credit growth once the economy recovers.

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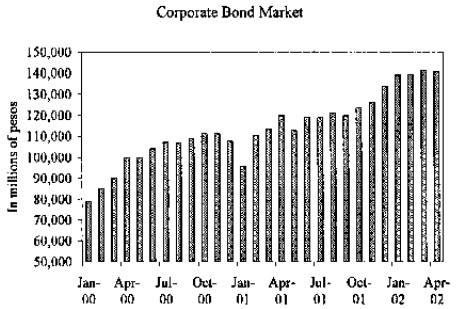
[8] In addition, some private companies have their own pension funds: however, data on these are not available.

[9] The development of a market for long-term fixed-rate securities has been promoted by the federal government: the government now issues fixed-rate securities on a regular basis (3- and 5-year bonds since 2000, 10-year bonds since 2001 and a 7-year bonds that was introduced in 2002). Institutional investor participation in this market has been strong and the existing government benchmark issues have facilitated the recent emergence of corporate issuers.

Box 1: Domestic Capital Markets

- **The local corporate bond market has developed rapidly in the last year**, owing to the sharp decline in domestic interest rates, the growing appetite of domestic institutional investors for corporate paper, and the success of a new instrument, called *certificados bursatiles*. The stock of corporate bonds has increased by about 40 percent from December 2000 to May 2002 even though it is still very small at about 2½ percent of GDP.



- The stock of *certificados bursatiles,* which were introduced with the approval of the new capital markets law in 2001 and were first issued in August of 2001, has risen quickly to reach Mex$33 billion, equivalent to US$3.6 billion, at end May 2002. The characteristics of these issues have varied: tenor has been between 3 and 10 years, some two thirds were issued at variable rates (with either the rate on TIIE or CETES as the reference rate), but even some of the 10-year bonds were at fixed rates, a novelty for the Mexican market.

- Only 15 entities accounted for this issuance, and 3 of them accounted for 63 percent of the total issuance. The main issuers in this market have been blue chip companies, which are AAA-rated on the local scale. The advantages of this new instrument are: the flexibility of design of the instrument by allowing the establishment of an issuance program (the corporation obtains approval for the total amount to be issued in bonds in the program but can choose to make the issues in different tranches to take advantage of market opportunities); the ease of issuance as there is no need to have permission from the shareholders' assembly once the program is approved; and lower costs of issuance.

- So far, there is no secondary market for these corporate bonds, as they are mainly in the hands of buy-and-hold domestic institutional investors and they cannot be repoed. However, the banks that issue them are guaranteeing some liquidity.

- **The local equity market, *la Bolsa Mexicana de Valores* (BMV), has not been an important source of financing in recent years,** mainly because since the Russian crisis emerging market equities has been a shrinking asset class and domestic institutional investors do not yet play an important role on the BMV. The BMV had a capitalization of US$129 million dollars at the end of May, equivalent to 20 percent of GDP: this is very low not only compared to advanced economies, but also to other emerging market countries. In addition, the free float is much smaller than the market capitalization, as most companies continue to have a control shareholder. Foreigners play a very important role, as they hold almost half of market capitalization and account for over two thirds of the free float and trading. Even though the MSCI, the benchmark index for most foreign equity investors, has recently undergone a rebalancing that hurt Mexico, the lack of good opportunities in the rest of the region has meant that they have not reduced exposure to Mexico and maintain a relatively large overweight. The rest is held by domestic institutional investors, mainly mutual funds and private pension funds.

Retail investors appear to play a negligible role in this market, although the recent introduction of an exchange traded fund that tracks the IPC, the main stock exchange index, is likely to encourage retail investor participation in this market, together with the sizable decline in interest rates. The anticipated participation of SIEFORES in the near future will likely stimulate more activity in the equity market. These changes, together with important changes in corporate governance (see Chapter 1), and improvements in technology and costs in the BMV have created a more favorable environment for equity issuance. However, neither the authorities nor private market participants expect a very rapid increase in equity issuance in the near term.

11. **Only a restricted group of Mexican companies have access to international capital markets.** Since 1995, over 40 Mexican companies have issued bonds in international markets, and less than 10 since the Russian crisis, as the risk appetite for these issues has diminished greatly. While a handful of companies (less than 10) enjoy an investment grade rating that allows them to appeal to a broader investor base—including high-grade investors—the rest have a credit rating below investment grade and hence their market access remains linked to emerging markets' performance.

12. **Financing of firms through the equity markets also suffered as a consequence of the 1994–95 crisis.** The lack of an adequate regulatory framework to inspire confidence in the aftermath of the crisis, as well as the dismal performance of equity markets in emerging economies, depressed the demand for traded equities and their valuations, and consequently inhibited the supply of new stocks. Between 1994 and 2001, market capitalization in the Mexican Stock Exchange (BMV) declined from 45 percent of GDP to 20 percent. The number of companies registered in the BMV is very small (less than 200) and ownership of these firms is highly concentrated. The latter implies that liquidity in the equity market is low, as only a small fraction of the stocks are traded: this is so also because most of the largest Mexican companies' stocks trade in New York.

C. Private Firms' Financing Sources

13. The Bank of Mexico (BOM) carries out a quarterly survey on firms' financing sources that provides information on the financing of a broad set of companies, about 600 of them. Although this survey covers only financing sources external to the firm, staff estimates suggest that internal financing sources—that is reinvested earnings—cover a sizable part of firms' financing needs. For example, for publicly traded companies, accumulated profits and reserves account for over 60 percent of capital and about 30 percent of capital and total liabilities.[10] These percentages are likely to be higher for the universe of companies, given that the smaller the company, the less the access to financing sources external to the firm. The high share of internal financing in total firms' financing can help explain why the Mexican economy has been able to have a good growth performance in the second half of the 1990s, despite declining credit to the private sector.

14. **The most important source of firms' financing is suppliers' credits.** For over 50 percent of the firms, suppliers' credit is the main source of external financing and this share has been steadily increasing over time (see Table 3).[11] For 20 percent of the firms,

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[10] Although these figures refer to stocks, they can provide an indication of the importance of reinvested earnings in overall firms' financing.

[11] It should be noted that the BOM survey reports the percentage of firms who use a specific source of credit but the answers are not weighted by the amount of the credit provided. Therefore, the results should not be understood as indicating that a given source of credit is more important on the basis of the amount of the financing provided to the firms but only in terms of the number firms that have access to that form of credit.

credit from commercial domestic banks is the main source of fund and its share has been on a declining trend since the inception of the survey in 1998. The reasons provided in the survey for not using bank financing are high interest rates, reluctance of banks to provide credit, and an uncertain economic environment (Table 4).

15. The third source of financing comes from enterprises of the same group mentioned by about 12 percent of the firms. Other sources identified separately are foreign banks with about 5 percent of the firms, development banks with about 2–3 percent, and parent companies with a share of about 3 percent. Bond issuance does not appear separately in the BOM survey but is included in the category "other," suggesting that this source of funding has been only marginal, so far. Further, outside equity does not enter the survey at all, but as noted above has been a negligible financing source in recent years.

Table 3. Mexico: Firms' Financing Sources [1/]

	1999	2000	2001	2002 [2/]
Suppliers' credits	47.4	50.5	53.5	56.4
Domestic commercial banks	25.0	23.3	21.2	19.7
Foreign banks	7.4	6.3	5.4	3.8
Other firms of same group	12.8	13.1	12.6	12.2
Development banks	2.9	2.3	2.2	3.2
Parent company	3.0	3.2	3.3	3.3
Other liabilities	1.6	1.5	1.8	1.4

Source: Bank of Mexico.
1/ The annual data are averages of quarterly data.
2/ The data for 2002 refer to the first quarter.

Table 4. Mexico: Firms' Reasons for Not Using Bank Credit [1/]

	1999	2000	2001	2002 [2/]
High interest rates	34.2	35.1	29.8	26.6
Demand problems for their products	3.9	3.4	4.9	4.7
Bank's unwillingness to lend	19.9	19.0	15.7	19.9
Economic uncertainty	13.4	15.4	20.2	19.2
Financial restructuring difficulties	10.4	9.1	9.4	11.1
Application rejected	4.4	6.0	7.5	8.4
Past-due loan portfolio	6.5	5.8	4.4	4.5
Market competition difficulties	3.9	4.5	4.8	4.7
Other	3.6	1.7	3.5	0.9

Source: Bank of Mexico.
1/ The annual data are averages of quarterly data.
2/ The data for 2002 refer to the first quarter.

16. **The financing structure differs considerably according to the size of the firm** (Table 5). The shares of domestic and foreign bank financing, as well as "other liabilities" increase with the size of the firm, at the expense of suppliers' credit which declines with the size of the firm. However, only AAA firms (with 1997 sales larger than Mex$5,000 million) have a share of domestic bank financing that is significantly above that of other firms (averaging about a third of total). For these firms, domestic bank credit represents the largest source of financing, while for all other categories suppliers' credit remains the main one. Another peculiarity of AAA firms is that the share of "other liabilities" has been increasing rapidly, reaching 10 percent in the first quarter of 2002, while the average for all enterprises is below 2 percent. The latter is mainly due to the rapid development of the corporate bond market in the last nine months (see Box 1).[12] Finally, foreign banks finance mainly large and AAA firms. The high concentration in the Mexican banking system and the high level of foreign ownership could exacerbate the tendency to provide credit mostly to large firms, as studies show that these characteristics of the banking system are associated with more credit to large firms and less to small firms.[13]

17. **Some differences exist in the financing pattern of firms based on whether they are exporters or not** (Table 6). Exporters typically use less suppliers' credits and more foreign bank financing. Also, they tend to have more funding from their parent company, but less from other firms of the same group.

18. **Not only is domestic bank financing small in Mexico, but also it is mainly short-term** and hence is being used mostly as working capital (over 60 percent), while only less than 17 percent was used to finance investment in the last three years (Table 7). As suppliers' credit is of very short-term maturity,[14] it appears that firms have to rely on foreign or development banks' financing or on funds from the group or internal financing sources to finance investment expenditure, which requires long-term credit.

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[12] However, this rapid increase in "other" financing needs to be interpreted with caution because the sample of AAA companies is very small (under 30 companies). Large swings in this category can be due to just one or two additional firms issuing in the local bond market.

[13] Publicly available information provides the composition of credit to the private sector by sectors of economic activity but not by size of companies. The BOM is currently working with the CNBV and the banks to improve the survey of credit data provided by banks.

[14] The BOM survey contains also data on firms that provide financing to other enterprises. Over three quarters of firms report that they provide some form of credit to other firms. The share of credit to their clients amount to almost 80 percent, and to their suppliers and enterprises of the same group about 10 percent each.

Table 5. Mexico: Firms' Financing Sources by Firm Size [1/ 2/]

	Suppliers' Credit	Domestic Commercial Banks	Foreign Banks	Other Firms of Same Group	Development Banks	Headquarters	Other Liabilities
1999							
Small	56.3	20.9	3.3	12.1	3.4	3.4	0.7
Medium	48.3	25.8	6.2	14.3	2.8	1.9	0.8
Large	36.1	28.6	11.8	13.4	2.1	4.4	3.8
AAA	26.5	33.0	25.5	5.4	3.4	1.8	4.4
2000							
Small	60.9	17.6	2.2	13.3	2.3	3.3	0.5
Medium	50.9	25.4	4.2	14.5	2.0	2.5	0.6
Large	40.2	26.4	11.9	11.9	2.9	3.8	2.9
AAA	23.4	34.1	22.8	7.1	1.1	3.5	8.1
2001							
Small	63.0	17.5	1.9	11.3	2.5	2.8	1.2
Medium	54.8	21.5	3.7	14.0	2.0	2.7	1.4
Large	42.0	24.3	10.8	13.3	2.1	5.0	2.6
AAA	29.5	30.8	18.7	9.0	2.5	3.2	6.4
2002 [3/]							
Small	62.4	14.3	2.9	12.5	4.3	2.5	1.1
Medium	59.1	20.7	1.3	12.5	2.6	3.0	0.8
Large	46.8	23.7	8.6	11.5	2.2	6.5	0.7
AAA	32.5	37.5	7.5	10.0	2.5	0.0	10.0

Source: Bank of Mexico.

1/ The annual data are averages of quarterly data.

2/ Small firms are those with 1997 sales of up of Mex$100 million; medium firms had sales of Mex$101–500 million; large firms had sales of between Mex$501–5000 million; and AAA firms had sales above Mex$500 million.

3/ The data for 2002 refer to the first quarter.

Table 6. Mexico: Firms' Financing Sources by Firm Type [1/]

	Suppliers' Credit	Domestic Commercial Banks	Foreign Banks	Other Firms of Same Group	Development Banks	Headquarters	Other Liabilities
1999							
Exporters	44.1	26.3	10.1	9.7	4.1	4.3	1.5
Nonexporters	52.3	22.9	3.5	17.2	1.3	1.2	1.7
2000							
Exporters	46.2	25.8	7.9	10.9	3.2	4.3	1.7
Nonexporters	55.9	20.3	4.2	15.7	0.9	1.7	1.3
2001							
Exporters	50.2	22.4	7.4	10.3	2.8	5.0	2.0
Nonexporters	58.2	19.7	2.6	15.6	1.5	1.0	1.6
2002 [2/]							
Exporters	55.4	19.6	3.5	11.4	4.6	4.6	0.9
Nonexporters	57.5	19.9	4	13	1.6	1.9	2.1

Source: Bank of Mexico

1/ The annual data are averages of quarterly data.

2/ The data for 2002 refer to the first quarter.

Table 7. Mexico: Firms' Uses of Bank Credit [1/]

	1999	2000	2001	2002 [2/]
Working capital	60.3	61.4	62.5	68.7
Liability restructuring	11.8	14.8	12.6	11.8
Foreign trade transactions	7.9	7.8	7.4	7.2
Investment purposes	16.5	13.1	14.0	9.7
Other purposes	3.5	3.0	3.5	2.6

Source: Bank of Mexico.
1/ The annual data are averages of quarterly data.
2/ The data for 2002 refer to the first quarter.

D. Credit to Households

19. **Direct credit to households is very limited.** The stock of bank loans for housing declined from 7 percent of GDP in 1994 to 3 percent of GDP in 2001 and consumer lending, despite its solid growth in the last few years, was less than 2 percent of GDP at end-2001, only half its 1994 level in terms of GDP (Table 8).[15] In recent years, SOFOLES have filled part of the void left by commercial banks and have become a fast growing source of lending to households. SOFOLES' assets (1.5 percent of GDP) are accounted for almost entirely (94 percent) by loans for housing and automobile purchases. Consumer loans from banks are mostly in the form of credit cards.[16]

Table 8. Mexico: Credit to Households, 2001
(In percent of GDP)

	Banks	SOLFOLES	Total
Total	**4.3**	**1.5**	**5.8**
Consumer	1.1	0.7	1.8
Housing	3.2	0.8	3.9

Source: Bank of Mexico.

[15] Consumer credit here excludes credit to households provided by non-financial institutions such as wholesale stores which at end-2001 was equivalent to 1.2 percent of GDP. This source of financing has grown nine-fold in real terms since 1994.

[16] In addition to SOFOLES and bank loans, there are consumer loans granted directly by commercial establishments and retail stares. The total amount of registered consumer loans though these providers of credit was about 0.3 percent of GDP at end-2001.

20. **The authorities have been promoting a restructuring of the credit market for housing which should result in a resumption of credit growth in this segment of the market in the near future**. The strategy seeks to refocus the government's participation in the sector shifting from providing credit to the provision of loan guarantees through the newly created *Sociedad Hipotecaria Federal* (SHF) and by strengthening the credit programs of FOVISSSTE and INFONAVIT, particularly for low income households.[17] In addition, the SHF is in charge of promoting the development of the market for mortgage-backed securities.

E. Recent Regulatory Reforms

21. The authorities believe that in order to support broad-based economic growth, credit to the private sector needs to recover and that access of small- and medium-sized enterprises to credit market's needs to improve. For this purpose, they adopted a strategy to promote the resumption of credit growth whose objectives are to: promote domestic savings; strengthen the legal framework; foster the financial consolidation of the financial sector; deepen the development of domestic capital markets; and restructure the development banks.

22. The main reforms approved since January 2000 include:

- approval of the People's Savings and Credit Law (*Ley de Ahorro y Crédito Popular*) and the creation of the National Savings and Financial Services Bank (BANSEFI), which contribute to the development of the financial sector for low-income people in a secure and transparent environment;

- approval of the Securities Markets Law in 2001 which includes changes to the legal framework for securities markets to improve transparency and corporate governance of traded companies and of stock brokers, enhance minority shareholders' rights, regulate conditions under which public offerings are mandatory, and the creation of the *certificados bursatiles* as an instrument to help develop the long-term debt market (see Chapter 1);

- approval of the new Investment Fund Law, which introduces a new approach to the regulation of such funds by establishing new rules regarding corporate governance of these institutions and widening the asset classes in which they can invest;

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[17] FOVISSSTE and INFONAVIT are specialized public agencies which administer an earmarked contribution from public and private sector workers, and whose purpose is to provide credit for low income housing. Commercial banks borrow from these agencies at competitive rates and in turn provide housing lending to workers affiliated to them. If the credit is in good standing throughout the life of the loan, FOVISSSTE and INFONAVIT provide a discount of up to 20 percent of the value of the loan.

- creation of a Federal Housing Institution (*Sociedad Hipotecaria Federal),* which will provide credit and loan guarantees to promote the resumption of housing lending and the development of a market for mortgage-backed securities;

- overhaul of development banks which improves accountability and corporate governance, including through the regular publication of their financial statements and supervision by the *Comisión Nacional Bancaria y de Valores* (CNBV), ensuring the preservation of their capital, improving their credit culture and strengthening their ability to provide technical assistance to their clients;

- reforms of the Credit Institutions Law, which incorporates best corporate international practices that provide, inter alia, for better transparency, corporate governance, and the inclusion of independent board members and an auditing committee. Introduction of a legal framework that facilitates banks to provide products and services with broader scope and enforces controls on credits to related parties. Strengthening of supervision coupled with a reduction of its costs by introducing prompt corrective actions to provide better protection to bank depositors and delegating a greater supervisory responsibility to external auditors;

- strengthening of bank regulation and supervision by enhancing the mandate of the CNBV improves corporate governance of commercial banks, promotes competition, and brings capital requirements closer to international standards. New rules on classification of the loan portfolio, overall risk management, and internal controls have been implemented;

- reforms to the Pension System Law,approved by the House but not yet by the Senate which would allow workers not affiliated to the Mexican Institute of Social Security to have an account in a public pension fund (AFORE): this will result in increased retirement savings. The reform includes the widening of the assets in which pension funds can invest (see below);

- amendments to banks' capitalization requirements, which are in accordance with international standards with the aim of reactivating credit for housing;

- approval of a law that regulates the operation of credit information institutions, strengthening the rights of individuals to access and correct their credit information;

- approval of a new bankruptcy law (*Ley de Concursos Mercantiles*) which provides incentives for voluntary arrangements between creditors and debtors seeking to preserve the value of the company and to expedite the resolution of the problems that led the company to face payments problems;

- other reforms to promote the development of institutional investors in an environment of higher accountability and transparency, and an improvement of

the regulation of insurance companies, credit unions, and foreign exchange houses.

23. As mentioned above, **recent changes to the investment requirements for pension funds and the decline in interest rates has led them to invest more in private securities.** In fact, these changes were aimed at widening the choice of assets in which pension funds can invest. While before a maximum of 35 percent of the pension funds' portfolio could be invested in securities issued by private entities, this limit has been eliminated. Instead, the present limits are set in terms of credit rating of the issuer, rather than whether the issuer is private or public. Now, pension funds can invest up to 100 percent of their portfolio in AAA-rated securities (on the local scale), up to 35 percent in AA-rated, and up to 5 percent in A-rated ones. However, concentration limits have been tightened. While before there was a 10 percent limit on any single issuer, now the limits are 5 percent of the portfolio for a single AAA-rated issuer, 3 percent for a AA-rated, and 1 percent for a A-rated issuer.[18]

24. Although restrictions on pension funds' investments have been eased, they remain constrained to invest in securities issued only by Mexican entities, have at least 51 percent of their portfolio in securities with inflation protection, and cannot invest in equities.[19] **These restrictions have made pension funds captive investors in the local fixed income market.** However, to ease these restrictions, mitigate the country risk, and allow pension funds to obtain a satisfactory return on their investments, further changes are afoot. Some amendments to the law on pension funds have been submitted to congress and have already been approved by the lower house. One of the main changes of these amendments is to allow pension funds to invest in securities issued by non-residents. [20] If approved, these changes will likely lead to some funds being invested in foreign securities issued, but it is likely that pension funds will continue to have a home bias even after they are allowed to diversify their investments abroad. Consequently, they should increasingly play an important role in the financing of the private corporate sector. Furthermore, *Comisión Nacional del Sistema de Ahorro para el Retiro (*CONSAR), the regulatory body of pension

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[18] This is because SIEFORES' funds have grown significantly and hence the previous limit would have entailed a very large amount of paper of an individual issuer.

[19] Pension funds are restricted to having a maximum of 10 percent of their portfolio in foreign currency securities, which must be issued by Mexican entities. While previously, only UMS dollar bonds were allowed, recently the choice has been extended to issues of any Mexican issuer with investment grade rating on the global scale either in U.S. dollars, euros, or yen.

[20] The changes to this law would allow SIEFORES to invest up to 20 percent of their portfolio in securities issued by non-resident entities, while at present they cannot invest in these assets. This limit would be introduced gradually and it would be 10 percent the first year.

funds which has the authority to decide on the instruments in which pension funds can invest, could also allow pension funds to invest in equities in the future.[21]

25. **Finally, the government submitted to congress a reform proposal that would expedite creditors' ability to recover the guarantees used as collateral in loan contracts.** The proposal would allow the use of commercial trust funds to provide a loan guaranteed by the collateral provided by the debtor. If the client defaults on its obligations, the bank would be able to liquidate the trust fund and take possession of the guarantees without the need for a judicial order or the signature of the debtor. At present, the relatively weak functioning of the judicial system makes the process of recovering the collateral a long and expensive one. In addition, recourse to the legal system has given debtors the possibility of using dilatory practices which prevent creditors from foreclosing on debtors' assets. This not only increases the risks to banks and consequently the lending rates, but it has also added to the disincentives to lend to the private sector altogether, especially to the lesser known clients (small- and medium-sized companies). The government anticipates that this legislative proposal would provide an added boost to the resumption of credit by providing commercial banks with greater legal certainty about their ability to collect the guarantees.[22]

F. Prospects for Credit Growth

26. The authorities' efforts to improve the legal framework of the financial system are likely to pay off in the near future by facilitating a resumption of credit growth. The consolidation of the banking system, the relatively high levels of capital and loan provisioning, plus a satisfactory level of liquidity, will likely permit a recovery in credit growth as the economy rebounds. In addition, the recent decline in interest spreads, as well as the competition from the bond market, will begin to affect banks' profitability and thus will force them to look for alternative sources of income, making them more willing to take on more credit risk in order to improve the bottom line. However, large corporations are still likely to be the big winners of this resumption of credit, at least in the initial stage, as they are the ones who have been able to maintain relations with banks.

27. **However, at a later stage, it is likely that the top-rated companies will increase their borrowing abroad—since they are better placed to access international capital markets—and this will open up the domestic capital markets to lower-rated firms.** Nevertheless, the credit rating limits which domestic institutional investors are subject to, as well as the desire of issuers and intermediaries to retain this as a high grade market in order

[21] The CONSAR together with the BOM have also recently introduced a regulation that allows pension funds to use simple derivatives to mitigate their risks.

[22] The government anticipates that the trust funds will be used not only for commercial loans but also for housing loans and thus provide a boost to this market as well. Nonetheless, demand for this mechanism for housing loans may not be as high as the authorities anticipate because it does not provide the same level of legal protection that homeowners are used to under traditional mortgage-backed loans.

27. **However, at a later stage, it is likely that the top-rated companies will increase their borrowing abroad—since they are better placed to access international capital markets—and this will open up the domestic capital markets to lower-rated firms.** Nevertheless, the credit rating limits which domestic institutional investors are subject to, as well as the desire of issuers and intermediaries to retain this as a high grade market in order to avoid the bad experiences of the early 1990s, will likely limit the credit quality of the issuers in the bond market. In line with the global tendency of banks to become service providers more than direct providers of credit, Mexican banks are likely to continue to encourage their customers to access the bond market directly, and hence it is likely that domestic capital markets may become as important as direct bank credit in the medium term.

28. **Banks will likely resume direct lending by increasing credit to the best rated companies first, slowly moving down the credit curve**. In a medium-term equilibrium, the largest corporates will continue to have access both to international as well as domestic credit markets while somewhat smaller companies, but still A-rated, will mostly borrow from domestic capital markets. Lower-rated companies or non-rated smaller companies are expected to borrow directly from domestic banks. Nonetheless, in the near future, development banks are likely to play an important role in providing credit access to small- and medium-size corporations.

29. **Even though it is likely that equity issuance will resume over the medium term, neither the government nor private market participants expect a very rapid increase in issuance in the near future**. The global tendency towards the concentration in a few very large equity markets will probably mean that the largest companies will be quoted in New York, while the BMV will become mainly a market for medium and small firms.

30. Despite the positive outlook for a resumption in credit growth and in general more sources of financing for private firms, there are some policy actions that the authorities could take to further this process. In particular, **fiscal consolidation should continue apace to reduce the public sector's absorption of domestic savings and release resources for private investment.** The net borrowing requirements of the public sector have been equivalent on average, to 60 percent of domestic financial savings over the last seven years. Since demand for credit from the private sector was depressed during this period, the large absorption of loanable funds by the public sector was possible in an environment of declining interest rates. Nonetheless, moving forward, in order to allow broad-based credit growth without exerting excessive pressures on interest rates, the public sector will need to reduce its demand for domestic savings as the economy recovers.

31. **Another area where progress is needed is the development of the credit infrastructure.** Both banks and clients are not used to operating in the credit market and will need to be trained. Banks will need to strengthen their credit risk assessment capabilities, as they have done very little lending to clients other than the government and large corporations in recent years. A similar argument needs to be made for domestic institutional investors which need to increase their ability to analyze credit risk and not rely merely on credit ratings or on the safety of government securities. A credit culture on the part of enterprises also needs to be fostered—especially among smaller firms and microenterprises.

III. Public Sector Debt Management[1, 2]

A. Introduction

1. **Mexico has made substantial progress over the past few years in reducing the risks associated to its public debt**. The rapid recovery from the 1994–95 crisis and the macroeconomic stability achieved since then, together with its well-regarded debt-management practices, have earned Mexico an investment grade rating on its sovereign external debt from the three main credit rating agencies.

2. The main achievements in debt management in recent years include the reduction in the share of public external debt, the development of a yield curve for sovereign bonds in international capital markets, the improvement in the amortization profile of external debt, and the conduct of liability management operations such as the Brady-bond buybacks and swaps. Hedging strategies have also further reduced currency risk. On the domestic front, the authorities have promoted the development of a market for public sector debt instruments by adopting a regular program of issuance and introducing a system of market makers. This has allowed the government to extend the average maturity and duration of its domestic debt first by issuing long-term bonds indexed to inflation or to short-term interest rates and, more recently, through the issuance of long-term fixed-rate bonds.

3. This chapter reviews the composition of public debt and the debt-management strategy pursued by the authorities in recent years with a view to identifying potential remaining vulnerabilities and propose tentative suggestions for enhancing the debt-management strategy. **The chapter finds that the debt policy followed by the federal government has produced impressive achievements in reducing the roll-over and**

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[1] This paper was prepared by Juan Pablo Córdoba (WHD) and Laura Papi (ICM).

[2] This chapter will deal with debt management at the federal level only. Throughout this paper public-sector debt will refer to the *gross adjusted federal government public-sector debt*. This corresponds to the authorities' definition of *Saldo Histórico de los Requerimientos Financieros del Sector Público* on a gross basis and includes the gross debt of the federal government, public enterprises (including accrued liabilities on direct PIDIREGAS projects (Box 1)), development banks, *Instituto para la Proteccion al Ahorro Bancario* (IPAB), *Fideicomiso de Apoyo al Rescate de Autopistas Concesionadas* (FARAC) and of other financial trust funds (e.g., *Fondo de Operacion y Financiamiento Bancario a la Vivienda* (FOVI), *Fideicomisos Instituídos en Relación con la Agricultura* (FIRA). It excludes gross debt of subnational governments which at end-2001 was less than 2 percent of GDP. Subnational governments cannot borrow abroad, they need to register all their debt with the Secretariat of Finance and Public Credit (SHCP) and in order to issue debt domestically they need to be rated by credit rating agencies and establish a fiduciary account with transfers from the federal government to partially ensure the debt service costs.

Box 1: PIDIREGAS Projects

PIDIREGAS (*Projectos de Inversión de Impacto Diferido en el Registro del Gasto)* are public sector investment projects undertaken by the private sector. This project-financing mechanism was developed to allow the government to undertake priority investment projects by contracting them out to the private sector, while deferring their registration as government expenditure in the budget. The private sector provides the financing during construction and until the government acquires the assets.

While the information on the stock of PIDIREGAS liabilities is publicly available, the public-debt statistics do not consolidate this information with the external debt, as Article 18 of the General Law of Public Debt establishes that only the next two years of the debt service of PIDIREGAS must be consolidated with public debt and the remainder is classified as a contingent liability. Here we report as PIDIREGAS liabilities both these components plus the obligations that the public sector acquires due to projects that are not yet completed and transferred to the public sector, and hence that have not yet been recognized as public debt or as a contingent liability. The authorities have been publishing this information since 2001.

Of the total outstanding liabilities on PIDIREGAS projects, Petróleos Mexicanos (PEMEX) accounts for almost US$15 billion, of which US$12 billion have been issued by PEMEX Master Trust and $3 billion have been provided directly by private sector contractors. PEMEX Master Trust is an offshore affiliate of PEMEX that was created to obtain financing for PIDIREGAS projects. It issues debt in international capital markets and provides financing to private sector contractors undertaking PIDIREGAS projects for PEMEX.

interest rate risks of domestic debt, as well as in lowering the share of external debt in recent years. However, the risks related to domestic debt still remain relatively high. In addition, the authorities could further enhance their debt-management strategy by developing a benchmark for public-sector debt, streamlining the types of instruments available in the domestic market, and improving coordination among public sector issuers. This should be possible in the near future, if the strategy pursued in recent years continues to be applied.

4. The rest of this chapter is structured as follows: Section B presents the institutional framework for debt management; Section C describes the current composition of public sector debt in detail; Section D discusses the authorities' debt-management strategy; and Section E offers some concluding remarks.

B. Institutional Framework for Debt Management

Debt-management objectives

5. The authorities view debt management as a key element in their goal of generating macroeconomic stability and strengthening public finances. **While they do not have a detailed debt-management strategy, their current policy is adequately geared towards reducing external vulnerability, diversifying their sources of financing, and developing a domestic debt market**. The authorities' objectives are:

- To finance the public sector deficit fully in the domestic market; this means that there are no net additions to the stock of external debt (with the exception of PIDIREGAS projects).

- To extend the maturity profile of external debt—reducing the rollover risk by avoiding large concentrations of maturities in a given year—and reducing its costs, as well as to diversify the investment base and currencies.

- To improve the maturity profile and extend the average life of domestic debt, and develop a long-term yield curve of domestic fixed-rate instruments.

6. **The importance given to debt management in the aftermath of the financial crisis of 1994–95 has complemented the authorities' efforts towards fiscal consolidation and allowed them to improve the amortization profile of both their domestic and external debt via liability management operations.** Until now, the authorities have not felt the need to develop an explicit benchmark[3] for public sector debt, mainly because of the

[3] A debt benchmark is used as a reference or desired portfolio that an issuer wishes to maintain and it balances the risks and costs confronting that issuer. This is different from the definition of a benchmark issue which is an expression used in the market to refer to large liquid issues whose price is a good reference for the cost of funds for that specific issuer at that duration.

relatively high interest rates on domestic debt and the need to continue making progress in lengthening the average maturity and duration of their domestic debt portfolio. Nonetheless, they recognize that in the future, having a reference point for their debt structure and developing a framework to systematically assess the trade-offs in debt-management decisions could be desirable but they stress that this could not be the only instrument to analyze debt-management decisions.[4] The authorities also stated that a benchmark for liability management could also pose problems because market conditions may not always allow debt managers to achieve the desired benchmark which would make it difficult to measure performance against the benchmark on a regular basis as is done with asset benchmarks.

Legal framework

7. **The legal framework for debt management is well established.** The constitution grants congress the power to establish the basis for federal government borrowing and to approve such borrowings and order repayments of the national debt. Congress approves separate annual limits on net external and domestic indebtedness of the federal government in the budget decree. The Law of the Federal Public Administration stipulates that the Treasury (SHCP) will be in charge of managing the public debt of the Federation and performing and authorizing all transactions involving public credit. Finally, the Law of Public Credit establishes which agencies are allowed to borrow and assigns to SHCP (through its General Direction of Public Credit—DGCP) the power to contract and manage the federal government's debt and to provide the guarantee of the federal government in credit transactions.

8. It follows from this legal framework that the DGCP is entrusted with the power to: i) negotiate and execute all documents related to public financing and authorize and register all borrowings by public entities, including those of development banks and public enterprises; and ii) negotiate and execute all documents related to financial transactions and derivatives to which the federal government is a party. The SHCP has to present detailed quarterly reports to congress on the state of public sector debt and the use of federal government guarantees, including a detailed description of the main transactions undertaken during the period.[5]

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[4] A debt benchmark is used as a reference or desired portfolio that an issuer wishes to maintain and it balances the risks and costs confronting that issuer. This is different from the definition of a benchmark issue which is an expression used in the market to refer to large liquid issues whose price is a good reference for the cost of funds for that specific issuer at that duration.

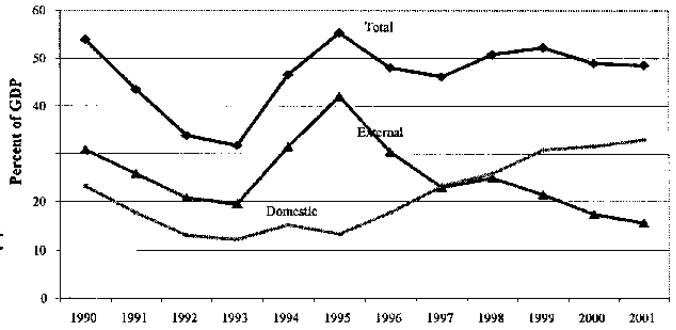
[5] In addition, the SHCP presents summarized reports to congress on a monthly basis. The annual accounts (*Cuenta Pública*) which include detailed information on the stock of public sector debt is presented to congress before June of the following year and audited accounts are to be approved by congress by August of that year.

9. Coordination between the SHCP and other public sector issuers is strong, although it is not subject to formal arrangements in the case of domestic debt. The three main domestic issuers (the federal government, the central bank, and the federal deposit insurance fund (IPAB)) announce quarterly issuance calendars, which provide guidance to the markets on the types of instruments and amounts to be issued during the quarter. Coordination is also evident in the segmentation of the market by type of instruments: each market segment is allocated to a single issuer and thus there is no competition between public issuers with similar instruments.[6]

C. Composition of Public Sector Debt

10. The most salient feature of the recent evolution of public sector debt is the sharp decline in the share of external debt following the authorities' policy of reducing external vulnerability by limiting their dependence on foreign funds and developing a domestic debt market for fixed-rate securities.[7] The increase in domestic debt since the crisis is mostly explained by the increase in liabilities associated to bank restructuring and debtor-support programs that were implemented after 1995 to help resolve the banking crisis, as well as by the choice of financing fiscal deficits domestically for the most part (Figure 1).

Figure 1. Mexico: Public Sector Gross Debt 1990-2001



Source: Ministry of Finance and Public Credit (SHCP).

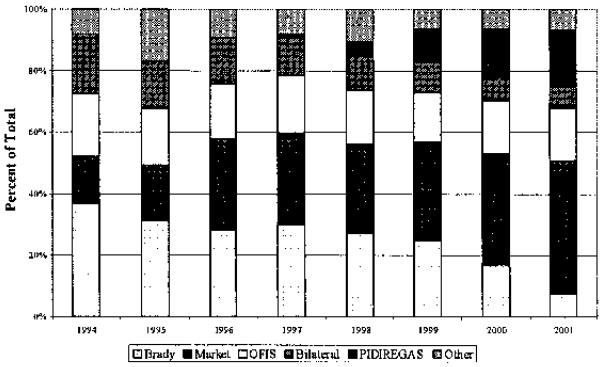
[6] For example the central bank issues bonds indexed to daily interbank interest rates (BREMS), IPAB issues long-term bonds (3- and 5-year) indexed to 28- and 91-day Cetes rates (BPAs), and the federal government issues different types of instruments (Cetes, Bondes, Bonos Tasa Fija, Udibonos) but none with the same structure as above.

[7] The ratio of public debt to GDP rose sharply as a result of the 1994–95 crisis, reversing all of the gains that had been achieved during the previous period following the restructuring of external liabilities in 1989–90 (the Brady bond program) and the fiscal consolidation of the early 1990s. Due to the large share of external debt before the crisis (over 60 percent), the increase can almost be fully attributed to the devaluation of the peso, to the substitution of external liabilities for dollar-linked domestic bonds (Tesobonos) that had been issued prior to the crisis, and to the large external financing package led by the Fund.

Public external debt

11. At end-2001, the $98.4 billion of total public external debt (including PIDIREGAS) (16 percent of GDP) could be classified into six major groups (Figure 2 and Tables 1–5). About half of external debt is i n the form of bonds and this share has been increasing in recent years. The share of multilateral, bilateral and bank debt has declined as has the share of Brady bonds as a result of several liability management operations. The only other component that is increasing is PIDIREGAS debt as a larger share of investment by the oil company, *Petróleos Mexicanos* (PEMEX) and the electricity company (*Comisión Federal de Electricidad,* CFE) has been undertaken in this form.

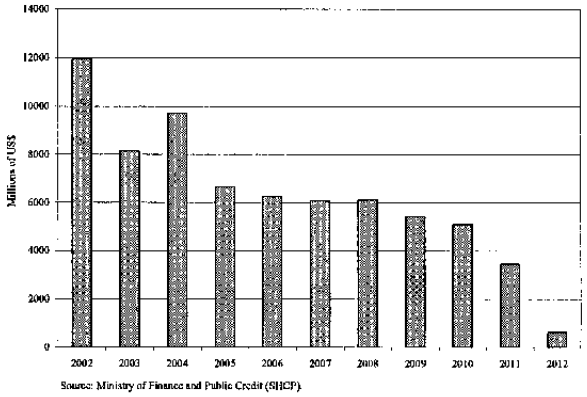
Figure 2. Mexico: Composition of External Debt 1994-2001



Source: Ministry of Finance and Public Credit (SHCP).

12. Short-term external debt (by residual maturity) represents 15 percent of total external debt.[8] Average maturity of external securities is close to eight years and there is no significant concentration of amortizations in a given year over the next 10 years (maximum amortizations of $9.7 billion in 2004 represent less than 11 percent of outstanding debt) (Figure 3).[9] Hence, **the relatively smooth amortization profile of long-term instruments combined with the low share of short-term debt, and an ample diversification of creditors, suggest that the refinancing risk of external debt is relatively low**. Refinancing of liabilities other than with bilateral (official) creditors has been relatively smooth and this is expected to continue into the future. Bilateral creditor exposure, on the other hand, is likely to continue declining

Figure 3. Mexico: Amortization Profile of External Debt



Source: Ministry of Finance and Public Credit (SHCP).

[8] Short-term debt by original maturity at end-2001 was $3.7 billion (5 percent of the stock) and amortizations of long-term debt coming due in calendar year 2002 were $8.3 billion (10 percent of the stock).

[9] Average maturity was calculated using residual maturity of external debt (loans and bonds) of the federal government and PEMEX external debt, excluding short-term debt by original maturity (trade finance).

gradually, but the outstanding stock of $6 billion could potentially be accommodated in market instruments, especially given the enhanced access to a wider pool of investors that Mexico enjoys as a result of its recent upgrade.[10]

13. Currency and interest rate risk of external liabilities are also relatively low. Some 71 percent of the sovereign's total external debt is denominated in U.S. dollars, 4.8 percent in Japanese Yen, 4 percent in the basket of currencies used by multilateral banks, and 1.7 percent in euros and other currencies (see Table 5).[11] This currency composition has been achieved despite the authorities' issuance in markets outside the U.S. (e.g., Euro-zone and Japan) by the active use of currency swaps to convert these liabilities into U.S. dollars. The appropriately high U.S. dollar exposure is justified by the strong links between the United States and the Mexican economy and the fact that public sector's foreign exchange earnings are all in dollars. In addition, the relatively low level of public external debt compared to other emerging market issuers (16 percent of GDP) and the high level of foreign exchange reserves, combined with the fact that 28 percent of government revenues are associated to oil exports or domestic sales of fuels denominated in U.S. dollars, reinforce the assessment that the public sector's currency risk is currently relatively low.[12]

14. The share of external fixed-rate debt is close to 75 percent of the total which seems prudent in terms of reducing the market risk associated to interest volatility (see Table 3).[13] However, the authorities could adopt a duration objective for their external debt benchmark and balance the share of fixed and floating rate instruments accordingly, taking into account the higher costs associated with higher duration instruments and the benefits of reducing market risk.[14]

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[10] As one of the largest emerging market issuers, Mexico's sovereign debt not only features prominently in the major emerging market indices (it has the largest weight in the EMBI+, 23.46 percent), but has also been included in the major global fixed income indices, most notably in the Lehman Aggregate, thus widening Mexico's investor base to U.S. high grade investors.

[11] Of the federal government debt (excluding PIDIREGAS), 87 percent is denominated in U.S. dollars.

[12] Furthermore, a depreciation of the exchange rate benefits the fiscal position, as dollar receipts associated with oil exports are significantly higher than the external interest payments in any given year.

[13] For federal government debt (excluding PIDIREGAS), the share of fixed rate debt is 90 percent.

[14] There is a tradeoff between reducing interest rate risk and the interest cost that would have to be paid (assuming an upward sloping yield curve, which is the case for Mexico's external debt at present).

Domestic debt

15. Total domestic debt at end-2001 was Mex$1.9 trillion ((32.7 percent of GDP).[15] The two largest issuers in the domestic debt market are the federal government and IPAB. Each of these represents approximately 46 percent of the total outstanding debt, while the remaining 8 percent is composed of domestic liabilities of public enterprises and public sector trust funds.

16. The federal government's debt can be classified into four types of instruments (Figure 4):

- **Cetes** (*Certificados de la Tesorería de la Federación*), which represent 11 percent of total domestic debt, are short-term benchmark government securities issued at a discount for 28-, 91-, 182-, and 364-day periods in weekly auctions.[16]

- **Bondes** (*Bonos de Desarrollo del Gobierno Federal)*, which represent 18 percent of domestic debt, are 3- and 5-year bonds with coupons indexed to short-term interest rates (91- and 182-day Cetes, respectively) issued bi-weekly;

- **Udibonos** (*Bonos de Desarrollo del Gobierno Federal denominados en unidades de inversión*), which account for 5.6 percent of domestic debt, are long-term bonds (5- and 10-years) indexed to inflation with a fixed real return issued every six weeks; and,

- **Fixed rate bonds** (*Bonos a tasa fija*), which account for 6.4 percent of domestic debt, are 3-, 5-, 7- and, 10-year bonds with fixed coupons issued monthly.

In addition, IPAB and FARAC (a public sector trust fund that restructured liabilities associated to toll road concessions) issue their own bonds on a regular basis.
IPAB issues **BPAs** (*Bonos de Protección al Ahorro*), which represent 9.2 percent of total domestic debt; these are 3- and 5-year securities indexed to Cetes rates and are issued in weekly auctions.

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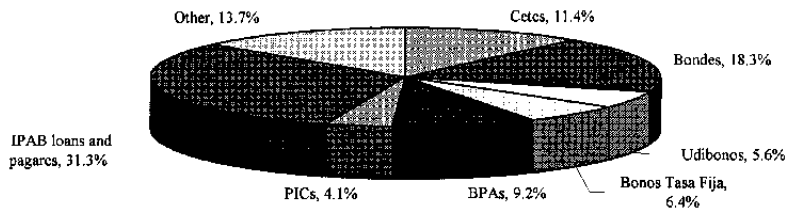
[15] Excluding the central bank. As mentioned above, the BOM sterilizes the accumulation of international reserves resulting from the purchases of foreign currency from the Treasury and PEMEX. The outstanding stock of BOM bonds was Mex$156 billion (2.7 percent of GDP) at end-2001.

[16] The 28- and 91-day Cetes are auctioned weekly, the 182-day Cetes bi-weekly and the 364-day Cetes monthly.

- FARAC, which accounts for 7.4 percent of the total stock of domestic debt, issues inflation-indexed long-term bonds called *(Pagarés de Indemnización de Carreteras* (PICs) (5-, 10-, 15-, 20-, and 30-year bonds).

Figure 4. Mexico:Composition of Domestic Debt, 2001
by Type of Instrument



Source: Ministry of Finance and Public Credit.

Contingent liabilities

17. One positive aspect of public debt statistics in Mexico is that to a large degree, they include contingent liabilities due to government guarantees. The authorities' efforts to expand the coverage of the public sector fiscal and debt statistics resulted in the inclusion of contingent liabilities vis-à-vis other public sector agencies and the private sector via public sector trust funds. Also by including liabilities associated with debtor-support programs, the coverage of public debt statistics is very comprehensive. This means that the likelihood of sudden increases in public debt due to the recognition of previously undisclosed liabilities is low in Mexico.

18. There are however, two known sources of contingent liabilities aside from the pension system (see Chapter IV). One, is associated to a form of PIDIREGAS projects not included above (operating leases) where the government instead of purchasing assets from the private contractor commits to purchasing the services (e.g., electricity) for a period of time at a given price. Under these contracts the government bears a price risk which is a source of contingent liabilities.[17] Another source of contingent liabilities is associated to interest coverage offered by the government in some of the debt restructuring programs implemented during the banking crisis.

[17] In addition, these contracts (*PIDIREGAS condicionados*) include a transfer clause in case of natural disasters or default by the government, but the transfer price is pre-established in the contract.

D. Public Debt Management Strategy

Public External debt

19. The stock of total public sector external debt has remained relatively constant in dollar terms since 1995 and thus has declined considerably as a share of GDP. This is in part explained by the authorities' policy of financing the federal government deficit in the domestic debt market to reduce their dependence on external funds, the repayment of the financing package associated with the Tequila crisis, and also liability management operations, involving mainly Brady bonds.[18] Taking advantage of favorable international market conditions in recent years, the authorities have been actively repurchasing or swapping their Brady bond liabilities to improve the profile of their external debt and obtain debt service savings (in present value terms).[19] As a result, they reduced the stock of restructured debt which in turn helped reduce the stock of external debt and provided considerable resources to the budget (from capital gains on both the principal and interest component of the collateral being released) (see Figure 5).

Table 1. Mexico: Composition of Public Sector External Debt
(In billions of U.S. dollars)

	1995	2001
Total public sector	**100.9**	**98,4**
Traditional public sector	100.9	79.4
Market bonds	17.8	42.5
Restructured (Bradys and other)	31.7	7.3
Multilaterals	18.7	16.0
Bilaterals	15.4	6.9
Other	17.1	6.5
PIDIREGAS	...	19.0

Source: Secretariat of Finance and Public Credit

20. **These debt-management operations were partly financed by new market issuance, which contributed to the development of a yield curve for sovereign dollar**

[18] By swapping new bonds for Brady bonds, authorities may reduce the nominal value of gross debt if the bonds being retired trade at a discount and also because the release of the collateral can be used to repurchase some of the outstanding bonds.

[19] In 2000–01 alone, $18 billion of Brady bonds were repurchased.

bonds. Since 1995, the federal government has issued close to US$25 billion in bonds in international capital markets, mostly in the dollar market. Currently, Mexico has liquid benchmark issues in all maturities up to 10 years and in key maturities up to 30 years. In 2001 Mexico issued its first 30-year bond in international capital markets.[20]

21. **PIDIREGAS have allowed the public sector to undertake investment projects that would have otherwise been delayed, but have complicated debt management by fragmenting a significant portion of the debt into a large number of smaller project-finance operations.** Coordination between the SHCP and PEMEX Master Trust (the main issuer for PIDIREGAS projects) is good, but the introduction of a separate issuer from PEMEX creates some confusion in the market regarding the consolidation of PEMEX liabilities. In addition, those projects not financed by PEMEX Master Trust and those of CFE—which are financed directly by contractors—may not be providing the least-cost and most appropriate financing available. Finally, domestic accounting rules governing PIDIREGAS are not consistent with international accounting practices for corporations, leading to problems in the consolidation of public sector debt statistics.

22. **In the aftermath of the Asian crisis, PEMEX issued US$5 billion in oil account receivables through an offshore vehicle called PEMEX Finance Ltd.** These issues were not guaranteed by the federal government or by PEMEX, but received an investment grade rating thanks to a structure by which PEMEX Finance purchased oil export receivables from PEMEX. While the authorities underscore that this structure was quite effective in raising needed liquidity in moments of adverse market conditions, they have stated that they do not plan to use structured instruments for their on-going financing program, under normal market conditions. The experience of PEMEX Finance indicates that Mexico could continue to have access to international capital markets using similar instruments under a temporary closure of markets or during an emerging market crisis. Nevertheless, the staff is strongly supportive of the authorities' intention not to use credit enhancements in normal market conditions.

Investor relations

23. In response to investors' concerns regarding the unavailability of some critical information at the time of the Tequila crisis, in July 1995 the SHCP established the Investor Relations Office (IRO). The IRO disseminates information via its website, emails through which it sends the latest publications or other relevant material, and its quarterly conference calls. It also maintains regular contacts with investors, analysts and credit rating agencies, is available to discuss issues or answer questions and to arrange meetings, calls, and road shows between policymakers and investors. Through its contacts with private market participants the IRO can also gauge market sentiment and become aware of investors'

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[20] The US$1.5 billion bond was issued in July 2001 and reopened for an additional US$1 billion in November. Mexico had issued another 30-year bond in 1996, but as part of a Brady bond exchange.

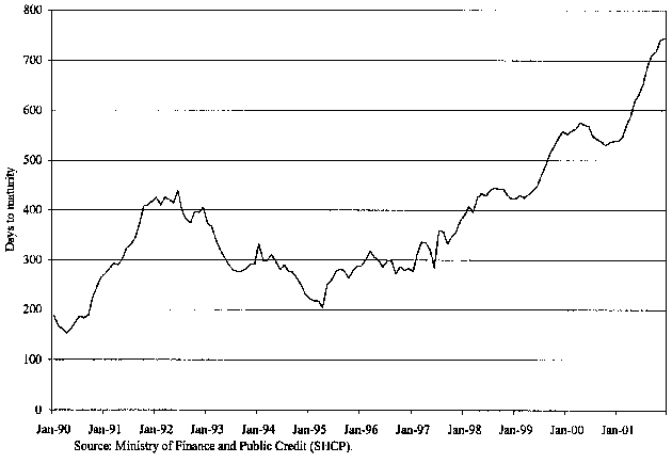
concerns/suggestions, which can benefit the authorities in the design of their policies, including in designing their issuance program.

24. The quarterly conference calls, as well as the road shows and at times ad-hoc conference calls to address a particular theme, are appreciated by the investor community, partly because very high level officials participate, and are one of the main strengths of the office. The IRO has contributed significantly to the improvement in transparency and is likely to help in reducing market volatility by providing a medium through which policymakers and market participants can exchange information, concerns, and suggestions.

Development of a domestic market for government securities

25. **During the last two years, the authorities have made considerable progress in extending the yield curve of domestic debt instruments.** In 2000 the authorities began to issue fixed-rate 3- and 5-year bonds and in 2001 they began issuing 10-year fixed-rate bonds. In July 2002, they introduced a 7-year fixed-rate bond. The gradual refinancing of floating-rate Bondes with longer dated fixed-rate instruments has allowed the authorities to increase the average maturity of domestic securities from 561 days at end-1999 to 786 days in May 2002 (Figure 5). In the case of Bondes, the intervals between yield revisions have been lengthened. In September 1997, all outstanding Bondes revised their yield every 28 days; at end-1999, 33 percent of them revised yield every 28 days and the rest every 91 days, and end-2001, 69 percent revised every 91 days and the rest every 182 days.

Figure 5. Mexico: Average Maturity of Domestic Debt 1990-2001



Source: Ministry of Finance and Public Credit (SHCP).

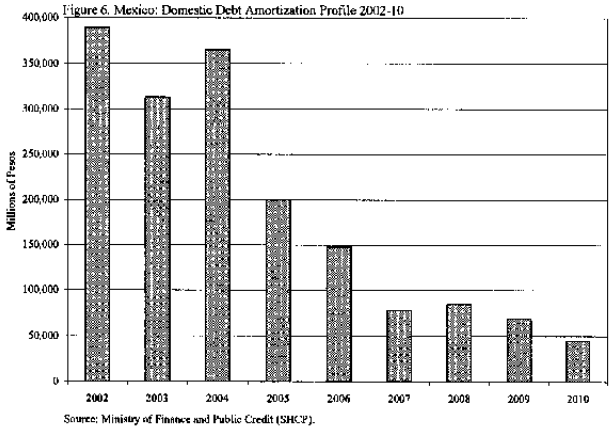
26. This strategy is expected to continue over the medium-term as fixed-rate bonds still represent a small share (14 percent) of the federal government's outstanding domestic debt (and 5.5 percent of the total). In fact, planned net issuance of fixed-rate bonds in 2002 is equivalent to the budget deficit of the federal government and thus net additions to the stock of debt will be done via long-term bonds. Similarly, the authorities have made substantive progress in improving the profile of amortizations of IPAB liabilities by repurchasing and refinancing existing liabilities with market instruments. At end-1999 two thirds of all

amortizations were concentrated in 2004–06, while at end-2001 amortizations during these years had been reduced to 38 percent of the total.[21]

27. **Prudent debt-management practices are also reflected in the authorities' decision, taken in 1995, to stop issuing dollar-linked debt after the Tesobonos were completely phased-out.** With the elimination of dollar-linked domestic debt, holdings by nonresidents of domestic debt instruments declined from 50 percent in 1993 to 10 percent in 1995 and declined even further after the Russian crisis, and was around 2 percent during 2001.[22]

28. **Notwithstanding these efforts, and in contrast with external debt, domestic debt is still subject to considerable refinancing and interest rate risks.** Indexed securities, including inflation indexed bonds, account for 76 percent of total domestic debt. These instruments were introduced to extend the average maturity of debt in an environment which, until recently, was characterized by high interest rates. While substantial progress has been made in increasing the average duration of domestic debt and the authorities' objectives are gradually being met, the share of short-term and indexed debt (which combined are equal to some 80 percent of total domestic debt) is still relatively large.[23] Given the still short average maturity of domestic debt, the debt amortization profile shows large concentrations over the next three years (almost 60 percent of outstanding debt comes due before 2004, Figure 6). The duration of the Treasury's domestic debt portfolio is 366 days, which means that the whole domestic debt portfolio will re-price once a year.

Figure 6. Mexico: Domestic Debt Amortization Profile 2002-10



Source: Ministry of Finance and Public Credit (SHCP).

[21] This has not only improved the amortization profile of IPAB but it has allowed creditors (mainly banks) to substitute tradable securities for non-tradable ones, improving the flexibility of their portfolio management.

[22] However, the official measure of direct holdings by non-residents is likely to underestimate their exposure to domestic debt instruments, to the extent to which they enter into derivate contracts whose underlying asset is a domestic debt instrument with a resident entity.

[23] Short-term debt by residual maturity represents 20 percent of the total stock of domestic debt. Long-term instruments indexed to short-term interest rates represent 60 percent of the total stock of domestic debt.

29. While the public sector has actually benefited from the relatively favorable liquidity conditions of domestic capital markets and the decline in domestic interest rates over the past few years, if market conditions remain favorable, the authorities could accelerate their efforts to reduce market risks by increasing the share of fixed-rate bonds. The reduction in interest rates and the rapid growth of domestic institutional investors will likely facilitate this process (see Chapter on Private Sector Financing in Mexico). The risk to the budget of this interest-rate exposure is high: it is estimated that a one percentage point increase in domestic interest rates would increase interest costs by 0.2 percentage point of GDP on an annual basis.

30. In addition, the authorities should continue with the adopted policy of gradually phasing out some of the vast array of indexed instruments issued by the federal government, and IPAB and replacing them with fixed-rate bonds. In fact, while the SHCP coordinates all public sector issuers, there is room for improvement over the medium term by having fewer and larger issues, preferably by a single government agency. The latter would facilitate the adoption of a comprehensive risk management system for the public sector as a whole, which would be desirable.

The domestic debt market—market makers

31. Liquidity in the secondary market of domestic debt instruments has improved substantially since the introduction of market makers in October 2000 (volume increased 10-fold and average daily transactions in 3- and 5-year bonds through brokers is approximately Mex$4 billion). The emerging market traders association (EMTA) reported that Mexican domestic debt was the most traded emerging market instrument. The main rights and obligations of market makers are:

- **Rights**. Market makers have the right to participate in a "green-shoe" auction following the auction of government securities in which they can buy up to 20 percent of the initial auction amount at the weighted average price of the auction; and 2) market makers have access to a BOM window where they can borrow securities (collateralized with other government instruments) for a small commission. In addition, the DGCP holds monthly meetings with market makers to exchange views on the development of the market where suggestions are made for changes and improvements in the regulation.

- **Obligations**. Market makers have to bid for the minimum between 20 percent of the amount of each government security being auctioned and the inverse of the number of market participants; and 2) they have to make two way quotes at all times for fixed-term bonds and Cetes through the brokers. Minimum transactions are Mex$20 million and there is a cap on the bid-offer spread of 125 basis points.

32. Market makers can be either banks or stock brokers. They are evaluated quarterly with an index measuring their participation in both the primary and secondary markets.[24] All participants who exceed a minimum threshold are selected as market makers. Currently there are six market makers.

33. With the purpose of increasing the liquidity of Federal Government debt instruments, the issuing strategy in the domestic markets has been modified to allow for fungibility. For this purpose, Cetes, Bonos, Bondes, and Udibonos issues are reopened several times in the primary auctions until they reach an acceptable amount outstanding that guarantees liquidity in the secondary market. Additionally, the authorities are considering modifying even further the policy of issuance of fixed-rate bonds in order to have fewer references along the yield curve with higher outstanding amounts for each one of them.

E. Conclusions

34. The recent progress in improving the maturity profile of both public external and domestic debt and the reduction in external vulnerability, constitute the main strengths of debt management in Mexico. In addition, the investment grade rating has given Mexico access to a broader base of institutional investors which should guard its access to international capital markets relatively to other lower rated emerging markets in times of market closures. This position is reinforced by the possibility of issuing oil-backed securities in times of crisis as was done in the past. The main remaining weaknesses in debt management are associated to the interest and refinancing risks of the domestic debt.

35. Consequently, despite the success achieved so far there are certain aspects of debt management that could be improved:

- **Adopt a comprehensive risk management system for the public sector as a whole**. While SHCP has full responsibility over all activities related with public debt at the federal level and coordinates with all public agencies in determining the types of instruments to be issued, the amounts, market access and timing, there are instances where risk management of public sector debt as a consolidated portfolio could improve debt management practices. In particular, there does not seem to be a concerted strategy to administer all liabilities of the federal government with the same

[24] The components of the index are: volume purchased in primary auctions (20 percent); volume traded with clients (nonfinancial intermediaries) (30 percent); volume traded with financial intermediaries through brokers (30 percent); volume traded with financial intermediaries over the counter (20 percent).

criteria. This task is complicated because these liabilities are held by three different agencies despite being fully guaranteed by the federal government.[25]

- **Develop a benchmark for public sector debt**. A benchmark can provide a reference point for the desired composition of the debt to be achieved over the medium term. The benchmark could consider the share of fixed and floating rate bonds, the currency composition, the amortization profile, the type of instruments, and market diversification as well as the composition of public sector assets and foreign currency earnings. Once the benchmark is approved this would provide an additional valuable instrument to assess all debt management decisions.

- **Make further progress in the disclosure of information on public debt and coverage of debt statistics**. While the government publishes a vast array of public debt data, this information is dispersed in different publications and does not lend itself to easy analysis. To further improve the quality of public sector debt information, the government could consider:

  - Integrating debt management associated with PIDIREGAS projects with that of the federal government; external financing plans should explicitly include the financial requirements of PIDIREGAS.

  - Streamlining the number of public sector issuers and the types of issues in the domestic market.

  - Making clearer to the market the distinction between the broadly disseminated financing data in the budget and the total borrowing requirement for the nonfinancial public sector.

[25] Not all IPAB liabilities are explicitly guaranteed by the federal government; however, the Law of IPAB establishes that if IPAB is be unable to meet its financial obligations, congress would adopt the necessary steps to ensure that these obligations are paid.

Table 2. Mexico: Total Public Sector Gross and Net Debt, 2001 [1/]

	Billions of pesos	Percent of GDP
Total public sector net debt	**2,426**	**42.0**
Total external net debt	**885**	**15.3**
Total external gross debt	920	15.9
Federal government	555	9.6
Rest of the nonfinancial public sector	288	5.0
Public enterprises	119	2.1
PIDIREGAS	169	2.9
Financial public sector	77	1.3
External financial assets [2/]	34	0.6
Total domestic net debt	**1,541**	**26.7**
Total domestic gross debt	1,888	32.7
Federal government	763	13.2
Traded securities	683	11.8
Other	80	1.4
Rest of public sector	1,125	19.5
IPAB	779	13.5
FARAC and other trust funds	274	4.7
Debtor support programs	58	1.0
Other [3/]	14	0.2
Domestic financial assets [4/]	347	6.0
Memorandum items		
Traditional public sector net debt [5/]	1,132	19.6
External	716	12.4
Domestic	416	7.2
GDP (billions of pesos)	5,772	100.0
Exchange rate (period average)	9.3	...

Source: Secretariat of Finance and Public Credit.

1/ Excludes Bank of Mexico and subnational governments.

2/ Includes financial assets of the federal government only.

3/ Includes public enterprises.

4/ Includes financial assets of the federal government, IPAB, trust funds and development banks.

5/ As published in public sector debt statistics. The total public sector debt concept used in the table corresponds to the *Saldo Histórico de los Requerimientos Financieros del Sector Público*. Stocks of external debt are valued at the period average exchange rate.

Table 3. Mexico: Composition of Public Sector Debt 2000–01

(In percent of total)

	2000	2001
External debt		
Term structure (original maturity)	100.0	100.0
Medium and long term	94.9	95.8
Short term	5.1	4.2
Term structure (residual maturity)	100.0	100.0
Medium and long term	80.0	77.9
Short term	20.0	22.1
Composition	100.0	100.0
Fixed rate	75.8	75.4
Floating rate	24.2	24.6
Domestic debt		
Term structure (residual maturity)	100.0	100.0
Medium and long term	82.2	79.4
Short term	17.8	20.6
Composition [1/]	100.0	100.0
Fixed rate	2.3	7.0
Inflation indexed	17.3	16.2
Floating rate	80.4	76.8
Exchange rate indexed	0.0	0.0
Other	0.0	0.0
Financial Indicators of public sector debt		
External debt		
Average coupon (percent)	7.7	6.3
Domestic debt		
Average coupon (percent)	20.7	13.3
Average maturity (months) [2/]	18.0	24.8

Sources: Secretariat of Finance and Public Credit and Fund staff estimates.
1/ Percent of long term debt.
2/ Of competitively traded securities (*valores gubernamentales*).

Table 4. Mexico: Public Sector External Debt by Type of Creditor, 2001

	Total (billions of US$)	Share of total
Total gross external debt	98.2	100.0
Capital markets	42.5	43.2
Multilateral creditors	16.0	16.3
IDB	6.0	6.1
IBRD	10.0	10.2
Foreign trade	7.6	7.7
Eximbanks	2.5	2.6
Commercial banks	3.8	3.8
Syndicated loans	0.8	0.8
Commercial paper	0.5	0.5
Bank loans	3.3	3.3
Restructured debt	10.0	10.2
Brady bonds	7.3	7.5
Other [1/]	2.6	2.7
PIDIREGAS	19.0	19.3

Source: Secretariat of Finance and Public Credit.

1/Includes suppliers credits and *"Base Monetaria 1990–92"*.

Table 5. Mexico: Public Sector External Debt by Currency, 2001

	Total (billions of US$)	Share of Total
Total gross external debt	98.4	100.0
By currency	80.3	81.6
U.S. dollar	69.9	71.0
Multilateral Institutions Currency Baskets	4.0	4.0
Japanese yen	4.7	4.8
Euro	0.6	0.6
Pound sterling	0.1	0.1
Swiss franc	0.1	0.1
Canadian dollar	0.3	0.3
Otras	0.6	0.6
Not-specified [1/]	18.1	18.4

Source: Secretariat of Finance and Public Credit.

1/ Refers to PIDIREGAS liabilities not included in the traditional public sector debt statistics, but these are mainly in U.S. dollars.

Table 6. Mexico: Public Sector External Debt, Amortization Profile 2001–12
(In millions of U.S. dollars)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total gross external debt	11,939	8,151	9,700	6,649	6,268	6,065	6,124	5,434	5,095	3,454	632
Capital markets	3,504	2,852	3,987	2,853	2,750	3,114	3,366	2,654	2,904	2,500	0
Multilateral creditors	1,804	1,696	1,731	1,769	1,775	1,582	1,368	1,646	836	533	376
Foreign trade	3,173	980	1,579	349	290	194	180	154	123	110	88
Bank loans	1,732	786	278	135	129	75	39	28	22	24	13
Restructured debt	827	505	495	351	323	57	3	3	79	3	3
PIDIREGAS [1/]	899	1,332	1,630	1,192	1,001	1,043	1,168	949	1,131	284	152
Memorandum item: Amortizations excl. trade credits	8,766	7,171	8,120	6,300	5,978	5,871	5,944	5,280	4,972	3,344	544

Source: Secretariat of Finance and Public Credit
1/ Amortization projections as reported in the March 2002 *"Informe sobre la Situación Económica, las Finanzas Públicas y la Deuda Pública"*.

Table 7. Mexico: Public Sector Domestic Debt by Debtor and Type of Instrument

	Billions of pesos	Percent of GDP
Total domestic net debt	**1,541**	**26.7**
Total domestic gross debt	1,888	32.7
Federal government	763	13.2
Cetes	187	3.2
Bondes	300	5.2
Udibonos	91	1.6
Bonos tasa fija	104	1.8
Other	80	1.4
Rest of the public sector	1,125	19.5
IPAB	779	13.5
BPAs	151	2.6
Loans and *pagares*	513	8.9
Other	86	1.5
Trust funds	244	4.7
FARAC	122	2.1
PICs	67	1.2
Other	55	1.0
Other	152	2.6
Debtor support programs	58	1.0
Other	14	0.2
Domestic financial assets	347	6.0
Federal government	73	1.3
IPAB	74	1.3
Trust funds	200	3.5
Memorandum item:		
GDP (billions of pesos)	5,772	100.0

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

Table 8. Mexixo: Amortization Profile of Domestic Debt, 2002–10
(In billions of pesos)

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total domestic debt	**389**	**313**	**365**	**200**	**148**	**78**	**85**	**69**	**45**
Federal government	300	158	280	0	0	0	0	0	0
Cetes	187	79	140						
Bondes	98	28	80						
Udibonos	11	21	19						
Bonos tasa fija	0	15	40						
Other	4	15	2						
Rest of the public sector	89	155	85	200	148	78	85	69	45
IPAB	75	155	85	200	148	78	85	69	45
Trust funds	14								
Debtor support programs									
Other									

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

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IV. The Financial Soundness of Mexico's Pension System[1]

1. In 1997, Mexico implemented a sweeping reform of its ailing public pension system. The reform transformed the pension scheme for private sector workers but did not cover the pension schemes for public servants (Box 1).

2. This chapter analyzes the financial soundness of Mexico's pension system. Section A provides some methodological background. The structure of the current pension system is briefly described in Section B. Section C summarizes the sources of financial stress for the pension system. The evolution of pension expenditures in the federal budget is presented in Section D. The likely future budgetary pressures from the pension system are analyzed in Section E. Finally, summary conclusions are provided in Section F.

Box 1: Mexico's Pension Reform

In December 1995, the Mexican Congress approved legislation that substituted the existing defined benefit pay-as-you-go (PAYGO) system for private sector workers with a fully funded defined contribution system based on privately managed individual accounts.[1] The new system also included a minimum pension guarantee for those workers whose savings were insufficient to provide a post-retirement income of at least one minimum wage of the Federal District (indexed to the CPI). In these cases, the government will provide the necessary resources to bridge any gap between the minimum pension and a worker's actual accumulated savings.

With the reform, the old PAYGO system was abolished and contributions to the Retirement Savings System (SAR92) were transferred to individual savings accounts. Contributions to the new system are compulsory for all private workers since September 1997. Each worker has an individual account that includes three sub-accounts: one for mandatory retirement savings, one for contributions to the housing fund INFONAVIT and one for voluntary savings. At retirement, workers may chose between a gradual withdrawal option or purchase an annuity in the insurance market. However, existing participants at the time of the reform (the so-called transition workers) were given the option to chose at retirement between the benefits under the old system or their accumulated balances under the new system.

Since inception, Mexico's privately managed pension system has experienced rapid growth. By end-2001, the system totaled 26.5 million individual accounts, which represented a coverage of 97.1 percent of the estimated universe. Assets under management by the AFORES increased from 3.0 percent of GDP at end-2000 to 4.3 percent of GDP at end-2001.

1/ The reform divided the social insurance system for private sector workers into old-age insurance, disability and life insurance and insurance for medical expenses of pensioners. The IMSS retained the administration of the latter two, while the administration of the old-age insurance was assumed by private administrators (AFORES). For further details on Mexico's 1995 pension reform, see Grandolini/Cerda (1998) and Sales/Solís/Villagomez (1999).

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[1] Prepared by Andreas Bauer (FAD).

A. Assessing the Financial Soundness of a Pension System

3. Public pension systems can be a source of fiscal vulnerability either because of the strain that pension outlays put on public resources and/or because unfunded pension liabilities may create expenditure pressures in the longer-term that raise questions about fiscal sustainability. An assessment of the financial soundness of a country's pension system is, therefore, an important element of any comprehensive analysis of fiscal risks.

4. The financial soundness of a specific pension system can be analyzed with the help of a number of indicators. These include the implicit pension debt, the financing gap or cash-flow deficit and the actuarial deficit.

5. The *implicit pension debt,* indicates the stock of benefit promises that a pension system has towards its participants.[2] It provides a measure of the liability--in net present value terms--that a government would incur if it were to terminate a pension system and settle all obligations with the system's participants.

6. A pension system's *financing gap* or *cash-flow deficit* is the difference between statutory pension payments and contributions in a given period. It provides a measure (usually on an annual basis) for the financial resources that need to be mobilized to fulfill a pension system's obligations.

7. The *actuarial deficit* of a pension system is the net present value of future cash-flow deficits. In contrast to the implicit pension debt, which only measures liabilities towards the current generation of participants, the actuarial deficit includes the contributions and claims of generations that are expected to enter the pension system in the future.

8. The above mentioned indicators are useful tools for the analysis of different aspects of financial soundness of a pension system. For instance, the implicit pension debt provides an indication about the transition cost that could arise from a fundamental reform of the pension system. The *financing gap* or cash-flow deficit is an indicator of the budgetary pressure that the system will exert in a given year, under the assumption that its parameters remain unchanged. The *actuarial deficit* is a measure of the sum of these budgetary pressures over a more extended timeframe.

9. The computation of the above mentioned indicators requires actuarial studies, which are based on a number of economic and biometric assumptions. In practice actuarial studies are often unavailable to the public. Still, a more qualitative assessment of the potential financial health of a pension system can be performed with the help of a number of descriptive demographic and economic indicators, which are usually correlated with a pension system's financial health. For instance, rapidly growing dependency ratios, high

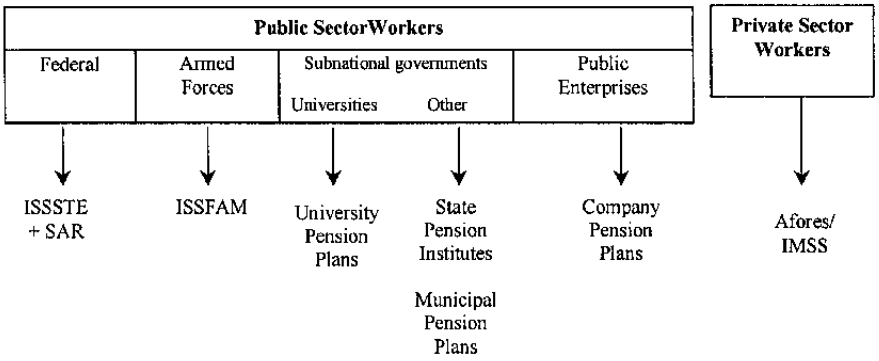
[2] These include pensioners and active contributors who have claims on the pension system.

salary replacement rates, lax pension eligibility criteria and low contribution rates are almost certain signs of future financial stress.

B. Mexico's Public Pension System

10. Mexico's pension system consists of a fully funded defined contribution scheme for private sector workers and a number of institutions that provide mostly defined benefit PAYGO schemes for public sector workers (Figure 1).[3]

Figure 1. Mexico's Pension System



11. Private sector workers were covered until 1997 by the Mexican Social Security Institute (IMSS), which operated a defined benefit PAYGO pension scheme.[4] The 1997 reform created a new system based on individual retirement accounts, which are managed by private pension administrators (AFORES).

12. Most pension schemes for public sector workers, operate as defined benefit systems that are funded on a PAYGO basis. The workers in the federal administration are covered by the Public Workers' Social Security Institute (ISSSTE), except for the military who are covered by the Armed Forces Social Security Institute (ISSFAM). ISSSTE's affiliates are also covered by the SAR92, which is a complementary scheme based on individual savings accounts.[5]

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[3] Most of these institutions provide a broad range of social security services to their affiliates, including pensions, health care, work accidents and life insurance and others. This document focuses exclusively on their function as providers of pensions.

[4] Pension systems can be classified according to several criteria, including their management (public or private), their way of calculating benefits (defined benefit or defined contribution), and their financing method (funded or PAYGO).

[5] The SAR92 was created in 1992 as a complement to the existing PAYGO systems. The SAR92 is a fully funded mandatory defined contribution system that provides individual retirement accounts for every worker affiliated with ISSSTE (prior to the reform, it also

13. In the parastatal sector, a number of public enterprises--including most importantly the oil company *PEMEX* and the electricity companies *CFE* and *LyF*-- have special pension plans for their workers.

14. Finally, at the subnational government level, many public workers are covered by state pension institutes.[6] Separate pension schemes also exist for the independent state universities and in some municipalities.

C. Sources of Financial Pressure

15. The financial soundness of a pension system may be compromised by specific design features that lead to a mismatch between the replacement and contribution rates. Most of these features are under the control of policymakers.

16. However, the financial health of a pension system may also suffer from exogenous factors. In this context, one global phenomenon that has put pressure on many pension systems in industrial and developing countries alike is the ongoing demographic transition caused by lower fertility rates and rising longevity.[7]

17. While Mexico is still a relatively young country--with an average age of its population of around 27 years--its elderly population will increase fivefold between 2000 and 2050 (Table 1). The old age dependency ratio will rise from 7 to 25 during the same period. The latter implies that by 2050 there will be only four people in the active age group (15–64 years) for every Mexican at age 65 or above.

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covered workers affiliated with the IMSS). Each retirement account consists of two sub-accounts; one for retirement savings and another for savings in a housing fund (FOVISSSTE). Contributions to each of the sub-accounts are 2% and 5% of a workers base salary respectively. The contributions are entirely borne by the employer (i.e. the government). Upon retirement, the accumulated balances from both sub-accounts are disbursed as lump-sum payments. For a more detailed assessment of the SAR92 see Grandolini/Cerda (1998).

[6] A number of subnational government institutions have their workers directly covered by ISSSTE on the basis of specific agreements.

[7] See Chand/Jaeger (1996) on the effects of aging populations for pension systems in industrial countries.

Table 1. Mexico: Old Age Population Dynamics in Mexico 2000–50

	2000	2010	2020	2030	2040	2050
Total population (in million)	97.4	111.6	125.1	137.8	148.0	155.7
Elderly population (in million) 1/	4.4	6.0	8.7	12.9	19.2	25.0
Old age dependency ratio 2/	7.2	8.1	10.1	13.9	19.6	25.1
Active/passive population 3/	13.9	12.2	9.9	7.2	5.1	4.0

Source: The World Bank.

1/ 65+ years.
2/ 65+ years aged as a percentage of 15–64 years aged.
3/ 15–64 years aged per each 65+ years old person.

18. These demographic aging has an adverse impact on the financial health of the remaining PAYGO pension schemes, which rely on the contributions of the (shrinking) active population to support the (growing) elderly population. In addition, the financial health of the pension system is compromised by a number of specific characteristics of design of the existing pension schemes which are summarized in Appendix Table I:

- The pension benefits for public sector workers are not related to a worker's salary history but rather to a worker's salary at retirement. Since public sector wages display a high degree of downward rigidity, the salary at retirement is normally the highest salary in the worker's entire career. This weakens the relationship between contributions and benefits.

- The pension schemes for the public sector also exhibit relatively high replacement levels up to full replacement of the contributed salary base. This contrasts with relatively modest replacement levels in the pension system for private sector workers.

- Generous replacement levels are coupled with relatively lax age and service requirements in the pension schemes for the public sector. Many public sector workers are entitled to a full pension after only 30 years of active service, irrespective of age. Private sector workers, by contrast, need to reach a minimum age of 65 (63 for women) to have access to a pension.

- In contrast to the expensive benefit levels, worker's contributions to the public sector pension schemes are low by international standards or non-existent. Therefore, the bulk of the cost of the pension benefits falls upon the employer (i.e., the government).

19. A number of descriptive quantitative indicators for Mexico's pension system are presented in Appendix Table II. The table shows that the mandatory AFORE system for private sector workers has by far the largest active population with 11.9 million contributors,

followed by ISSSTE with about 2.4 million contributors.[8] The transition generation from the old IMSS system accounts for the largest share of the passive population, totaling almost 1.9 million pensioners at end-2001.

20. Overall, the indicators presented in Appendix Table II confirm the potential for financial stress in most pension schemes. Most notably:

- Except for the AFORE system, which is a fully funded pension scheme, reserves for future pension obligations are either insufficient or inexistent.

- The dependency ratio in a number of pension schemes is already very low, particularly in the case of PEMEX where there are less than two active contributors per pensioner.

- The average retirement age for public sector workers is well below 60 years. This leads to a high life expectancy at the moment of retirement and, thus, high costs as pensioners receive their benefits over a prolonged time horizon. In addition, most public sector pension schemes have also survivor benefits that are quite generous by international standards.

D. Budget Expenditure on Pensions

21. Expenditures on pensions in the federal budget include statutory contributions to the pension system that derive from the government's role as an employer, transfers to finance existing *cash-flow deficits* in a number of public pension schemes, and the costs of the 1997 pension reform.

22. Table 2 shows expenditures on pensions in the federal budget between 1995 and 2002.[9] These exhibit a continuous increase from 1.3 percent of GDP in 1995 to 2.0 percent of GDP in 2002. As expected, the upward trend in expenditure accelerated markedly after 1997 due to the costs of the reform of the IMSS (see below). Since 1997, pension outlays rose almost 50 percent in real terms (7.1 percent on average per year).

[8] The number of afiliates to the AFORE system is much higher (26 million), but only 45 percent of them were actively paying contributions at end-December 2001.

[9] The Fiscal Transparency ROSC Module (SM/02/277) provides a detailed description of the coverage of the federal budget.

Table 2. Mexico: Budgetary Pension Expenditure 1995–2002
(In percent of GDP)

	1995	1996	1997	1998	1999	2000	2000 1/	2002 2/	Cumulative Real Growth 1997–2002 (in percent)	Average Real Annual Growth Rate 1997–2002 (in percent)
Total	1.3	1.4	1.4	1.5	1.9	1.9	1.9	2.0	48.1	7.1
Federal budget (Ramo 19)	0.1	0.1	0.1	0.2	0.3	0.4	0.3	0.3	146.5	18.8
Social quota	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	128.8	24.3
ISSFAM quota 3/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-11.4	-3.8
Military compensation 4/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.8	13.6
Special pensions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.8	9.4
Civil, military, and grace pensions 5/	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	37.8	6.0
One-time support for pensioners 6/	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	-	-
Other	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	75.8	-3.0
Organizations and enterprises	1.2	1.2	1.3	1.3	1.6	1.5	1.6	1.7	37.3	6.1
Pemex	0.1	0.1	0.2	0.1	0.3	0.1	0.1	0.1	-5.8	-
CFE	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	107.8	-
Ly FC	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	93.6	-
Ferronales	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Lotenal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
IMSS 7/	0.8	0.7	0.7	0.8	1.0	0.9	1.0	1.0	46.5	6.1
ISSSTE	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	42.6	6.1

Source: Secretariat of Finance and Public Credit.

1/ Preliminary.
2/ Budget as approved by congress.
3/ Employer contribution to ISSFAM.
4/ One-time compensation for affiliates to ISSFAM who retire before reaching minimum pension requirements.
5/ Cost of pensions for affiliates of ISSFAM.
6/ One time compensations to railroad and sugar industry workers.
7/ Includes pensions of IMSS workers (RJP).

E. The Financial Soundness of Mexico's Pension System

23. The evolution of budgetary expenditure is only a partial indicator of financial pressures from the pension system, since defined benefit systems which are financed on a PAYGO basis may be accumulating sizeable future liabilities even if present cash-flow deficits are low or non-existent. Therefore, the assessment of the financial health of the pension system needs to be complemented by actuarial studies to determine its long-term sustainability.

Mexican Social Security Institute (IMSS)

24. Since the 1997 reform, the federal budget covers all liabilities associated with the transformation of the pension system for private sector workers. In addition, the IMSS has pension liabilities towards its own workers, which have to be financed from the budget.[10]

Costs arising from the 1997 pension reform

25. The 1997 reform created both transition and permanent costs for the government. The government assumed the obligation to pay the implicit pension debt that the previous PAYGO system held with existing participants (also called the transition generation).[11] The full cost of existing pensions is now financed by the government since all contributions from active workers were transferred into the new private retirement accounts. In addition, workers in the transition generation were given the option to chose at retirement between the benefits under the old system or those provided under the new system. This option created a contingent liability, since it commits the government to supplement a transition worker's accumulated retirement savings in order to finance the benefits under the old system.[12]

26. In addition, the AFORE system created new costs that will have to be financed on a permanent basis from the budget. These costs include the so-called "social quota," which is a flat bi-monthly contribution made by the government to each retirement account[13] and the cost of the minimum pension guarantee that was extended to workers whose accumulated balances in the individual savings accounts are not sufficient to buy an annuity of at least one minimum wage.

27. Estimations of the total reform costs (transition plus permanent costs) require the formulation of assumptions since some of its components cannot be predicted with certainty.[14] Table 3 presents a number of estimates that have been made on the basis of different sets of assumptions.

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[10] The workers of IMSS are excluded from participating in ISSSTE, which is the general pension scheme for federal government workers.

[11] The transition generation includes those workers who were contributing to the old system at the time of the reform but had not yet retired.

[12] The decision of a worker to opt between the benefits under the old or new system will depend upon the amount of accumulated retirement savings and the real wage level. The liabilities for the government will be lower the longer a worker's contribution period, the higher the real return of the pension savings and the lower the real wage growth.

[13] The social quota was set equal to 5.5 percent of the minimum wage in July 1997 indexed to the CPI.

[14] For example, the fiscal cost arising from the minimum pension guarantee will depend on the return that is being achieved by individual savings accounts.

Table 3. Mexico: Estimated Cost of the 1997 Pension Reform
(In percent of GDP)

	Grandolini/Cerda (1998) 1/	Sales/Solis/Villagomez (1999) 2/	IMSS (2002)
Annual total cost of reform 4/	1997: 0.93	1997: 0.77	n.a.
	2015: 1.04	2036: 3.05 8/	n.a.
	2025: 1.19	2047: 2.62	n.a.
NPV of: Transition cost 3/	n.a	82.6 7/	n.a.
Total cost 4/	17.7 6/	n.a.	9.9 5/

1/ Assumes GDP growth of 3.5 percent, average real wage growth of somewhat less than 2 percent, and a real return on pension savings of 3.5 percent. The simulation excludes resources from the INFONAVIT account.

2/ Assumes GDP growth of 3 percent, real wage growth of 0.8 percent, and a real return on pension savings of 3.5 percent. The simulation excludes resources from the INFONAVIT account.

3/ Include the cost of pensions for existing pensioners at the time of reform plus the cost of additional pensions under the old system from transition workers who made use of their switch option.

4/ Includes the transition cost plus the cost of the social quota and the minimum pension guarantee.

5/ Projection period: 2001 to 2101 as stated in IMSS (2002)

6/ Projection period: 1997 to 2024, using a 3.5 percent real interest rate

7/ Projection period: 1997 to 2047, using a 5 percent real interest rate

8/ Maximum cost during the projection period.

28. As Table 3 shows, the total costs of the reform are expected to rise over the next several decades from the current level of about 0.7 percent of GDP a year and could reach close to 3 percent of GDP a year by 2030. The estimates differ quite significantly, especially in the longer term, reflecting uncertainty about costs associated with the switch option for the transition generation and the minimum pension guarantee in the new system.

29. Overall, the projected cost increase reflects the incidence of the transition generation that is expected to retire under the benefits of the old system. The cost of pensions for those who were already retired at the time of the reform is expected to decline relatively quickly. At end-2001, the total cost of pensions under the old system was Mex$30.4 billion (0.5 percent of GDP). The cost of the social quota is expected to stabilize at about the current level of 0.2 percent of GDP, while the costs associated with the minimum pension guarantee will not materialize until the new generations of contributors become eligible for retirement (in about 20 years).

Liabilities from the collective labor contract

30. Despite the 1997 reform, the IMSS has kept a role in the social security system as a provider of health care services and life and disability insurance.[15] While the federal

[15] The most recent actuarial study shows that the disability and life insurance is financially viable in the long term. However, the health insurance for pensioners exhibits an actuarial deficit of 8.5 percent of GDP over the next 50 years under the assumption of an unchanged

government has assumed the costs associated with the pension reform, the IMSS maintains an unfunded pension liability vis-à-vis its own employees, which derives from the institution's own pension plan (RJP) that is part of the collective labor contract.[16]

31. The RJP already suffers from a very low dependency ratio with 102,000 pensioners being supported by only 371,000 contributors. The plan offers very generous retirement conditions (100 percent replacement of the integrated salary with only 28 years of service) and collects only a 3 percent contribution from its members. In addition, due to the specific pattern of hiring in the past, the number of pensioners is projected to increase by 134,000 people (131 percent) over the next ten years.[17]

32. According to the financial statements of IMSS, the RJP registered a cash-flow deficit of Mex$15.4 billion (0.25 percent of GDP) in 2001, including Mex$8.5 billion in reserves for future pension liabilities.[18] The implicit debt of the RJP was estimated at 5 percent of GDP.[19] This amount is substantial, especially given the relatively small number of participants in the RJP.

Public Workers' Social Security Institute (ISSSTE)

33. The population affiliated with ISSSTE is aging rapidly due to general demographics but also because of the specific personnel policies of the federal public sector.[20] ISSSTE's dependency ratio has increased from 1:40 in 1980 to 1:5 in 2001 and is expected to reach 1:2 by 2020. As in most of the other public sector pension schemes, the financial impact of the rising demographic pressure is compounded by the generosity of ISSSTE's pension benefits. With a contribution of only 7 percent of base salary (3.5 percent from the worker), the ISSSTE scheme offers its affiliates a 100 percent replacement rate of their base salary after

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contribution rate and a rather optimistic evolution of costs in the health sector. See IMSS (2002) for details.

[16] The workers of IMSS are excluded from participating in ISSSTE, which is the general pension scheme for federal government workers.

[17] IMSS registered two waves of massive new hiring during the times of abundant oil windfalls in the late 1970s and the late 1980s.

[18] However, these reserves only covered about ¼ of the provisions that would have been required on the basis of the RJP's actuarial assessment.

[19] The actuarial study was based on a real interest rate of 3.5 percent, a projection horizon of 100 years and zero real wage growth. The actuarial valuation of the plan established a net present value of pension obligations of 5.2 percent of GDP, of which only 0.3 percent of GDP are backed by constituted reserves. See IMSS (2002) for details.

[20] While public sector employment grew very fast during the 1970s and 1980s, it has declined since the 1990s due to the need for fiscal adjustment. Currently, the average age of ISSSTE's contributing population is 41 years.

30 years of service (28 years for women).[21] The generosity of the pension system leads to a fairly low average retirement age of 56 years (down from 62 years in 1980) and a high life expectancy at retirement (22 years). The result is a large disequilibrium between contributions and benefits, with the difference being charged to the budget since the federal government is committed by law to cover any shortfall of resources for ISSSTE's pension obligations.[22]

Since ISSSTE was not able to accumulate significant reserves in the past, the above mentioned pressures have already led to—small—cash-flow deficits. In 2001, this deficit amounted to Mex$11.1 billion (0.2 percent of GDP) or more than half of ISSSTE's total pension expenditure.

Simulations performed by ISSSTE indicate that without reforms, the annual cash-flow deficit could increase to about 1.2 percent of GDP over the next 30 years and then stabilize at around that level for the following 50 years. ISSSTE's implicit pension debt is estimated by the authorities at close to 50 percent of GDP, and its actuarial deficit at 58 percent of GDP.[23] These liabilities are very high, both in absolute terms but also considering the relatively small affiliated population, indicating an urgency for addressing the underlying imbalances of the system in the near term.

Armed Forces Social Security Institute (ISSFAM)

34. Relatively limited information is available about the pensions provided through the ISSFAM. The number of participants is estimated at around 300,000 (which is the approximate size of the armed forces). The number of pensioners is estimated at somewhat more than 42,000.[24] According to the Law of ISSFAM (Art. 21), the cost of pensions for the retired and their survivors and lump-sum compensations for those who retire before reaching the required minimum service (20 years) is entirely borne by the federal government. In 2001, the cost of these benefits amounted to some Mex$3.3 billion (0.05 percent of GDP). Actuarial studies of the liabilities of the armed forces pension benefits are not publicly available.

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[21] The base salary represents on average about 75 percent of the affiliated worker's total salary. However, the effective replacement ratio is higher since the workers affiliated with ISSTE receive their contributions to the SAR92 upon retirement as a lump-sum payment.

[22] For example, the contributions in present value terms of a worker who earns a constant minimum wage over his working career only equal about 1/3 of the present value of expected pension benefits (based on a 5 percent discount rate).

[23] The estimates are based on a real interest rate of 3.5 percent and a 75 year (100 year) time horizon for the implicit pension debt (actuarial deficit).

[24] A publicly available document detailing the ISSFAM's administrative objectives puts the number of retired personnel at about 42,000. However, this number does not include survivor pensions.

Public enterprises

35. A number of public enterprises maintain their own pension plans. Within the budgetary public sector, the most important are those of PEMEX, CFE and LyF. Since most of these plans are fairly generous and require no contributions by the affiliated workers, they already represent a significant burden on the federal budget. Public enterprises only register part of the actuarial net cost of pension liabilities in their financial statements.[25] This practice has led to the accumulation of significant unfunded pension liabilities in most of the plans.

National Mexican Petroleum Company (PEMEX)

36. Mexico's budget registered cash outlays by PEMEX for pensions of Mex$4.2 billion (0.1 percent of GDP). However, according to the audited financial statement of PEMEX, the net actuarial cost of the pension system in 2001 would have totaled Mex$33.4 billion (0.6 percent of GDP). The pension plan of PEMEX is particularly onerous because of very high average wages, large statutory benefits for pensioners, low eligibility requirements and zero contributions from the workers towards the plan's costs. As of end-2001, the implicit debt of the pension plan was estimated at 3 percent of GDP.[26]

Electricity sector

37. Little detail is publicly available about the main characteristics of the pension plans of the electricity companies CFE and LyF. Cash outlays in the budget for CFE's pension plan totaled Mex$3.4 billion (0.05 percent of GDP) in 2001. Cash outlays in the budget for pensions by LyF were Mex$4.2 billion (0.1 percent of GDP). The detailed audited financial statements of CFE indicate that the company's implicit pension debt was estimated at 1.4 percent of GDP as of end-2001.[27] Information about the actuarial situation of LyF is not publicly available.

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[25] The public sector financial information norm NIF-08 BIS states that labor obligations are to be registered in line with the guidelines of the Mexican Institute of Public Accountants (Bulletin D-3 "Labor obligations") but can only be recorded up to the point of zero profit. Most public enterprises also prepare financial statements on the basis of Generally Accepted Accounting Standards (GAAP). These statements do record labor obligations in line with standard practice.

[26] The actuarial valuation of the plan established a net present value of pension obligations—assuming zero real wage growth—of 3.1 percent of GDP, of which only 0.1 percent of GDP are backed by constituted reserves. See PEMEX (2002) for details.

[27] Based on a real interest rate assumption of 5 percent and assuming a real wage increase rate of 2.5 percent. See CFE (2002) for details.

Sub-national governments

38. The federal government does not explicitly guarantee the pension liabilities of subnational governments. However, uncovered pension liabilities at the subnational levels could lead over time to rising pressures on the federal government to increase transfers to subnational governments or even to directly assume part of these liabilities.

39. In 1998, the federal government coordinated a broad assessment of the financial health of the pension institutes of the Mexican states.[28] The study, which was based on common actuarial standards and covered 29 out of a total of 34 state pension schemes revealed a dire financial situation. None of the covered systems was actuarially viable. The study estimated that by 2002, 16 out of the 29 pension schemes would produce cash-flow deficits that required transfer payments from the state budgets. The aggregate actuarial deficit of the covered pension schemes was estimated at 30 percent of GDP and the implicit pension debt at 10 percent of GDP.[29]

40. As in the other public pension schemes, the rapidly rising financial disequilibria in the state pension institutes result from contribution levels that are insufficient to finance extremely generous pension benefits in the context of rising demographic pressure. A few indicators highlight this situation. For instance, the number of active contributors per pensioner in these systems was expected to fall from 9.8 in early 1998 to 4.7 by 2010 and 2.15 by 2025. Also, the state systems provided an aggregate replacement rate of 116 percent. Overall, only three out of the 29 pension schemes analyzed in the study had minimum age requirements, while minimum service requirements ranged between 25–30 years.

F. Conclusions

41. Mexico's public pension system faces problems of financial viability and is accumulating public sector liabilities. Financial pressures from the pension system are bound to rise in the medium-term, albeit gradually.

42. Budgetary outlays on pensions have already been increasing at an annual real rate of 7 percent in recent years. If this trend is maintained, pension expenditures in the budget could rise further from 2.0 percent of GDP in 2002 to 2.3 percent of GDP by 2007. However, the rate of increase in pension outlays could be even higher in the longer term since most public sector pension schemes will confront their most dramatic demographic pressures over the next 10–20 years.

43. While the number of contributors to the pension schemes for public sector workers is much lower than those of IMSS at the time of the 1997 reform, their benefits are significantly

[28] In addition to the state pension institutes, pension schemes reportedly exist at autonomous universities and some municipalities. The latter two were not covered in the assessment and little information is available on their financial health.

[29] Using a 3.5 percent real interest rate and a projection period of 100 years.

more generous. Therefore, the combined liabilities of the remaining public sector pension schemes are substantial and the transition costs for reforming them will be significant. This is confirmed in Table 4, which provides a summary of the unfunded liabilities of the public pension schemes. While these deficits cannot be added to obtain the aggregate liability of the entire pension system since the calculations are not based on common actuarial assumptions, they still provide a clear indication that the order of magnitude of the unfunded liabilities in the pension system is a cause of concern.

Table 4. Mexico: Estimated unfunded liabilities in Mexico's Pension System
(In percent of GDP)

	Actuarial Deficit	Implicit Debt
IMSS (RJP)	n.a.	5.0
ISSSTE	58.0	50.0
PEMEX	n.a.	3.0
CFE	n.a.	1.0
Subnational governments	30.0	n.a

Sources: Secretariat of Finance and Public Credit (SHCP); Mexican Social Security Institute (IMSS); Public Worker's Social Security Institute (ISSSTE); National Petroleum Company (PEMEX); and CFE.

44. More importantly, since most pension schemes continue to accumulate liabilities under their current operation there is urgency in addressing the underlying disequilibria. This is especially true in the case of ISSSTE, which harbors the most important unfunded liabilities but also extends to the pension schemes of the public enterprise sector.

45. The government is aware of the fiscal risks associated with the financial situation of the public pension schemes. The structural reform agenda laid out in the National Development Plan for 2001–06 prominently includes fundamental reform of the pension system as a strategic goal of the government. The authorities' recently issued medium-term financial program (PRONAFIDE) recognized the need to proceed with the reform of the pension system, notwithstanding the transition costs that such reforms could generate.[30]

46. The authorities are taking steps to prepare for policy action. These include the elaboration of actuarial and administrative diagnostics reports on the financial health of ISSSTE and the RJP of IMSS.[31] This work should be extended in due course to cover all other public pension schemes.

[30] See Secretaría de Hacienda y Crédito Público (2002), pp. 45–46.

[31] See IMSS (2002) and ISSSTE (2002).

47. In addition to fundamental pension reform, the authorities can influence a number of policy variables which affect the costs of the 1997 pension reform. For instance, the fiscal costs associated to the new system's minimum pension guarantee and the cost of the switch option for transition workers will depend on the return that is being achieved by the individual savings accounts and the FOVISSSTE housing accounts. Policy actions to increase the real return of these accounts could therefore help reduce fiscal costs.[32]

48. Limited information is available on a number of public pension schemes and the aggregation of information on pension liabilities is difficult since most studies use different actuarial assumptions. Further improvements in this area would therefore be welcome as part of the authorities efforts to increase fiscal transparency.

49. Both the transition costs of the 1997 pension reform and the financial disequilibria in the pension systems for public sector workers will generate significant budgetary pressures in the not so distant future. In this context, the introduction of a medium-term budgetary framework, as recommended by the staff in the fiscal transparency module of the Report on the Observance of Standards and Codes (ROSC), would be a useful tool for a forward looking accommodation of these expenditures in line with sustainable fiscal policy.

[32] For example, the return of the housing fund INFONAVIT has been close to zero in the recent past. Also, the investment of pension funds is currently limited to fixed income instruments. Increasing the efficiency of INFONAVIT and broadening pension fund access to financial instruments could help increase the return of retirement savings.

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Mexico: Main Characteristics of Pension Plans in Mexico

	AFORES	IMSS Transition	IMSS RJP	ISSSTE	ISSFAM	PEMEX	CFE	LyF
Management	Private	Public	Public	Public	Public	Public	Public	Public
Type of system	Defined contribution; fully funded	Defined benefit; pay-as-you-go	Defined benefit; pay-as-you-go	Defined benefit; pay-as-you-go	Defined benefit; Pay-as-you-go	Defined benefit ; pay-as-you-go	Defined benefit ; pay-as-you-go	Defined benefit ; pay-as-you-go
Contribution rates (in percent of contribution base)	Worker: 1.125%[5] Employer: 10.15%[4] State: 0.0225% plus flat 5.5% of minimum wage	Worker: 0.75%[6] Employer: 9.1% State: 0.15%	Worker: 3 % Employer: assumes the residual cost of pension plan	Worker:3.5 % Employer: 3.5% plus SAR92 contributions[1]	Worker: None Employer: assumes full cost of pension plan	Worker: None Employer: assumes full cost of pension plan	Worker: None Employer: assumes full cost of pension plan	Worker: None Employer: assumes full cost of pension plan
Replacement levels (in percent of contribution base)	Old age: depending on accumulated balance Disability: 35% of average contribution base of last 500 weeks	Old age: 35% plus 1.25 % for each year of contribution above the minimum Disability: 70 %	Old age: X% - 100% depending on years of service Disability:	Old age: 50% - 100% depending on years of service Disability: 50% - 100% depending on legth of service	Old age: 60% - 100% depending on years of service Disability: 60% - 100% depending on years of service	Old age: 80-100% depending on years of service Disability: 60-100% depending on years of service	n.a.	n.a.
Eligibility Requirements	Old age: 65 years of age (use of minimum pension guarantee requires also 1250 weeks of contribution) Disability: min. of 250 weeks of contribution	Old age: min. 500 weeks of contribution and 65 years of age Disability: min. of 150 weeks of contribution	Old Age: min. 10 years of service and 60 years of age. Full pension with 28 years of service (27 years for women) Disability: min. 150 weeks of contributions[8]	Old age: min. 15 years of service and 55 years of age (30 years of service for full pension[2]) Disability: min. 15 years of service (30 years of service for full pension)	Old age: min. 20 years of service (30 years for full pension) Disability: min. of 20 years of service (30 years for full pension)	Old Age: min. 25 years of service and 55 years of age Disability: min. 16 years of service (30 years for full pension) if work related; otherwise 20 years of service	n.a.	n.a.
Contribution base	Integrated salary (up to a cap of 25 minimum wages)	Integrated salary (up to a cap of 10 minimum wages)	Integrated salary	Base salary	Integrated salary	Base salary	n.a.	n.a.
Benefit base	Accumulated individual retirement savings	Average integrated salary of last 250 weeks (last integrated salary for disability pension)	Last integrated salary	Average base salary of last year	Last integrated salary	Last base salary (average base salary of last year if less than 30 years of service)	n.a.	n.a.
Indexation of pension benefits	None	Minimum salary	Salary of active personnel	The higher of CPI and salary of active personnel	Salary of active personnel	Salary of active personnel	n.a.	n.a.
Public Minimum Pension Guarantee	Yes; equal to minimum wage of the federal district in 1997 indexed to CPI	Yes; equal to minimum wage of the federal district in 1997 indexed to CPI	No	Yes; equal to minimum wage of the federal district in 1997 indexed to CPI	No	No	No	No

Source: Secretariat of Finance and Public Credit (SHCP).

1/ The federal government is required to cover any cash deficits (Art. 177).
2/ 28 years for women.
3/ Members with more than five but less than twenty years of service receive a lump-sum compensation of 6–32 months of their integrated salary.
4/ Includes a 5 percent contribution to INFONAVIT housing fund.
5/ The disability and life insurance requires additional contributions of 0.625 percent from the worker, 1.75 percent from the employer and 0.125 percent from the government.
6/ An additional contribution of 3 percent was levied for disability and life insurance, which was distributed as follows: 0.75 percent from the worker, 2.1 percent from the employer and 0.15 percent from the government.
8/ No requirement for work related disability.

Mexico: Selected Pension Indicators of Public Pension Plans
(As of end-2001)

	Afores	IMSS Transition	IMSS RJP	ISSSTE	ISSFAM	PEMEX	CFE	State Pension Institutes
Contributors	11,854,000	Not applicable	371,000	2,369,000	300,000	116,000	55,000	790,000
Pensioners	108,000	1,855,000	102,000	411,000	30,000	63,000	19,000	81,000
Old age	-	221,000		208,000	n.a	27,000	n.a	45,000
Disability	108,000	489,000		12,000	n.a	17,000	n.a	6,000
Early retirement	-	545,000		95,000	n.a	7,000	n.a	12,000
Survivors	-	600,000		87,000	n.a	7,000	n.a	17,000
Other	-	-		8,000	n.a	5,000	n.a	1,000
Dependency ratio 1/	Not applicable	Not applicable	0.28	0.17	0.10	0.54	0.35	0.10
Contributors per pensioner	Not applicable	Not applicable	3.5	5.8	10.0	1.8	2.9	9.8
Average pension								
in Mex$ per month	n.a.	1,040	n.a	4,294	n.a.	12,212	9,777	2,973
multiple of DF min. wage		0.8		3.5		9.9	7.9	3.2
Average insured wage								
in Mex$ per month	n.a.	n.a	7,730	4,417	n.a.	17,628	13,529	2,556.4
multiple of DF min. wage			6.3	3.6		14.4	11.0	2.8
Effective replacement ratio (in percent) 2/	n.a.	n.a.	100	97	n.a.	69	72	116
Reserves (in Mex$ billion)	248.2	0	20.0	0	0	5.8	n.a.	n.a
Average retirement age (in years)	n.a.	n.a.	53 years	56 years	n.a.	58 years	n.a.	n.a.
Average life expectancy at retirement (in years)	n.a.	20 years	22 years	22 years	n.a.	n.a.	13 years	n.a.

Source: Secretariat of Finance and Public Credit.

1/ Pensioners as a percentage of active contributors.
2/ Average pension as a percentage of average insured wage.

V. Institutional Framework in Mexico[1]

A. Introduction

1. **Many studies suggest that institutional factors play a major role in explaining comparative growth performance across countries and in attaining economic stability.**[2] Against that background, this chapter examines the extent to which Mexico's fiscal, monetary, and financial institutions provide a basis for the maintenance of economic and financial stability, enabling needed actions in the face of external shocks. The main conclusions are:

- Despite some weaknesses, budget institutions and practices have provided a solid framework in recent years for the execution of fiscal policy, enabling an effective response to external shocks.

- Subnational government finances are not a source of major vulnerability in Mexico. The resource transfers from the federal to the subnational governments are rules-based and would allow for adjustment sharing under a stress scenario.

- Mexico's independent central bank has gained considerable credibility in recent years in the conduct of monetary policy.

- The Mexican financial system has improved its resilience to shocks in recent years and important progress has been made in the implementation of international standards and codes. As a result, the banking sector is not likely to pose systemic problems.

B. Budgetary Institutions

2. **The federal budget consists of two separate legal parts, a federal income law and an expenditure decree.** These are prepared by the Ministry of Finance and Public Credit (SHCP) and submitted together to congress for discussion and approval.[3] The federal income law is discussed and approved first by both houses of congress (chamber of deputies and senate). Subsequently, the expenditure decree is discussed and approved exclusively by the lower house (chamber of deputies). The federal budget covers the

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[1] Prepared by Andreas Bauer, Juan Pablo Cordoba, and Reva Krieger.

[2] For example, R. Barro, 1991, "Economic Growth in a Cross Section of Countries," *Quarterly Journal of Economics;* J. Sachs and A. Warner, 1995, "Economic Reform and the Process of Global Integration," *Brookings Papers on Economic Activity.*

[3] In addition to the income law and the expenditure decree, the budget documentation that is submitted to congress includes a document that lays out the general macroeconomic strategy for the next year (*Criterios Generales de Política Económica*).

central public administration, the judiciary, congress, the autonomous federal bodies and the parastatal sector under direct budgetary control, which includes social security and some major public enterprises such as PEMEX and the Federal Electricity Commission.

3. **Under the prevailing interpretation of the constitution, the congress has ample faculties to amend the budget, including the reallocation of expenditure and changes to the expenditure ceilings and the deficit.** While the constitution provides for executive veto, which congress can only override with a qualified majority of ⅔ of the votes, there is controversy concerning the extent to which veto power is applicable to the expenditure decree. In practice, the government has not vetoed congressional amendments to the draft budget (precedents date back to the 1920s). Nonetheless, the deviation between the expenditure decree proposed by the government and the one approved by congress has been small (less than 2 percent), despite some increase in recent years (Table 1).

4. **While legally possible, supplementary budgets have not been a practice in Mexico.** According to the constitution, spending cannot occur in the absence of approval by congress in the expenditure decree or in a separate law during the fiscal year. By law, the SHCP has strong control over the formulation and execution of the budget in dictating the norms and global expenditure limits for the process of budget preparation, establishing general guidelines and mandatory calendars for the actual budget execution and authorizing the re-allocation of expenditure within the budget. Non-interest expenditure can only increase above the approved budgetary appropriations to the extent that excess revenue is being collected.

5. **Mexico has a well-articulated system of budgetary audit and control.** In addition to the SHCP, the Secretariat of the Comptroller (SECODAM) acts as internal auditor of the public entities included in the budget. All parastatal entities have their financial statements audited by external audit firms as well as by SECODAM. The execution of the federal budget is audited by a recently created audit office (*Auditoría Superior de la Federación*), which formally belongs to congress but operates independently. The new audit office, which has greater powers than the previously existing *Contaduría Mayor de Hacienda*, reviews the final annual budget accounts (*Cuenta Pública*) that are sanctioned by congress, performs audits during the fiscal year, and can determine liabilities and penalties for public servants involved in irregularities. It is expected that the audit office's activity will contribute to improve accountability of government programs and public servants, but its impact will need to be assessed after the new arrangements have been in place for some time.

6. **Mexico has established a tradition of including fiscal responsibility principles in its budget to help ensure that the approved expenditure ceilings and deficit targets are met.** For example, the expenditure decree for 2002 establishes ceilings on global expenditure and net public indebtedness, as well as a primary surplus target for PEMEX. It includes automatic adjustors, which provide for saving of the bulk of excess revenue and which require offsetting expenditure cuts in the case of revenue shortfalls. Although the government retains discretion in applying these adjustors, the authorities have a track record of abiding by the adjustors to ensure compliance with the fiscal targets. Nonetheless,

even if the government opted to ignore the adjustors, the debt ceiling included in the annual income law would provide a legal limit to the overall nominal deficit and, thus, an indirect obligation to adjust expenditure.

7. **Overall, the budget institutions and practices have provided a stable framework in recent years for the execution of fiscal policies that are consistent with macroeconomic stability, including dealing with adverse economic circumstances.** Notwithstanding the increasing role played by congress in budget discussions in recent years, it has largely respected the deficit ceilings proposed by the government.[4] Also, as can be seen from the table below, actual budget execution has been very close to the approved deficit limits.

Table 1. Mexico: Budget Implementation in Mexico

	Budgetary Expenditure (in MexS million)			Overall Budget Deficit Target (in Mex$ million)		(in percent of GDP)	
	Budget Proposal	Authorized by Congress	Executed	Original (1)	Final (2)	Original (3)	Final (4)
1995	343,271	342,821	425,927	-24	-201	-0.00	-0.01
1996	540,970	540,970	528,533	480	283	0.02	0.01
1997	710,791	710,791	747,298	15,890	-23,011	-0.51	-0.72
1998	856,868	851,387	823,503	-47,348	-47,919	-1.25	-1.25
1999	1,023,438	1,012,767	1,013,905	-58,302	-51,988	-1.25	-1.13
2000	1,169,443	1,176,938	1,247,567	-52,502	-60,597	-1.00	-1.12
2001	1,321,202	1,343,467	1,308,601	-39,935	-42,050	-0.65	-0.73

Source: Secretariat of Finance and Public Credit (SHCP).

8. **The budgetary framework has also demonstrated its resilience in the face of external shocks and during economic downturns.** In 1998, the authorities effected expenditure cuts amounting to 0.7 percent of GDP as mandated for by the automatic adjustors in the face of a steep fall in oil revenue. In 2001, budgeted expenditure was again reduced, albeit by a smaller amount, as revenue fell short of the budgeted amount due to a sharp decline in oil revenue and the weakening in economic activity. In early 2002, the authorities cut expenditure preemptively by 0.2 percent of GDP in reaction to poor revenue performance during the first quarter. A portion of this expenditure cut was later reversed in light of higher than budgeted oil revenue in the second quarter.

[4] For 2001, the government agreed during the congressional budget debate to an increase of the overall deficit target from 0.5 percent of GDP to 0.65 percent of GDP. In the debate over the 2002 budget the overall deficit ceiling remained at 0.65 percent of GDP, as proposed by the government.

9. **The Fund's recent fiscal transparency module of the Report on Observance of Standards and Codes (ROSC) indicated that Mexico has made considerable progress in improving transparency in public finances toward compliance with good practices.** The assessment included a series of recommendations for further strengthening transparency of budgetary institutions, including a redefinition of the budget's institutional coverage of government, the presentation of the budget proposal in the context of a quantified medium-term rolling macro-fiscal framework, a more systematic publication of estimates of the effects of new measures, fiscal risks, quasi-fiscal operations, contingent liabilities, and tax expenditures, and stepped-up performance audits and publication of the findings and recommendations of external audits.

10. **Fiscal transparency would be further enhanced if the draft constitutional reform, that the government submitted to congress in April 2001, is approved.** The proposed reform aims at strengthening the budgetary process and clarifying a series of ambiguities that are present in the current legal framework. It would clarify rules regarding the presidential veto to congressional modifications to the government's budget proposal; provide more time for discussion of the budget in congress; set clear rules for the conduct of public finances in case the approval of the budget is delayed; allow for the authorization of multi-annual investment projects in the budget; and require that any modification to the draft budget be accompanied with a non-debt creating financing source. In addition, the constitution would include strong fiscal responsibility principles such as a balanced budget rule (over a four-year period), the requirement for the government to present the budget within a medium-term macroeconomic framework and a provision that revenue shortfalls be fully compensated through proportional expenditure cuts.

C. Subnational Governments

11. **Subnational governments in Mexico play a limited–but increasing-role in fiscal management.** Fiscal performance is dominated by the federal government given the specific arrangements among the different levels of government established in the constitution and in the *Ley de Coordinación Fiscal* (LCF) approved in 1978. Under these arrangements, all major taxes (income tax, VAT, import tariffs, and excises) are collected by the federal government, while subnational governments levy taxes mostly on real estate and the payroll and derive other income from user fees. More recently, subnational governments have been gradually given increasing expenditure responsibilities and currently account for about ⅓ of total public sector spending. These expenditures are mainly financed with transfers from the federal government, which comprise more than 80 percent of subnational government income. Because of these arrangements, and due to their limited capacity to issue debt thus far, subnational governments have run small surpluses in recent years (Table 2).

Table 2. Mexico: Subnational Government Public Finances, 1996–2000

(In percent of GDP)

	1996	1997	1998	1999	2000
States					
Revenue	5.0	5.8	6.4	6.8	n.a
Expenditure	4.9	5.7	6.4	6.6	n.a
Overall balance	0.1	0.1	0.1	0.2	n.a
Municipalities					
Revenue	1.0	1.0	1.2	1.4	n.a
Expenditure	0.9	0.9	1.1	1.4	n.a
Overall balance	0.0	0.0	0.1	0.0	n.a
Subnational government debt	1.8	1.5	1.4	1.2	1.1

Source: Secretariat of Finance and Public Credit (SHCP).

12. **Transfers to the states are made via transparent, nondiscretionary and publicly-known formulas**. There are two forms of transfers: The *participaciones (*which where established under the LCF to compensate states for the revenue foregone to the federal government) are set at 20 percent of tax revenue and oil royalties of the federal government and may be used freely by the states, after transferring a portion (at least 20 percent) to their municipalities. The *aportaciones* are rules-based transfers earmarked for expenditures in health, education, and social infrastructure, and for institutional strengthening. These have served to formalize previously-existing bilateral agreements between the federal government and the states by which the latter assumed the responsibilities of specific expenditure functions. Total transfers to the states were estimated at 8 percent of GDP in 2001, of which the *participaciones* represented 40 percent.

13. **Subnational government indebtedness is low and has been decreasing in recent years as a percentage of GDP.** The total debt of Mexico's states and municipalities was less than 2 percent of GDP in 2001. Since the debt crisis of 1982, subnational debt has not been a significant problem, although on a number of occasions the federal government has intervened in support of debt-restructuring programs for states and municipalities. The constitution prohibits states and municipalities to issue external debt and limits their domestic indebtedness for investment financing only, within the limits established by their legislatures in their annual budgets.

14. **In response to growing demands for increased subnational autonomy and to reduce the likelihood of future bailouts, Mexico adopted a market-based approach to controlling subnational debt in 2000**. The federal government's role as fiduciary agent in subnational government debt contracts (which was perceived by some as an implicit debt

guarantee) was abolished and banking regulations were strengthened to increase credit controls. Bank loans to subnational governments now require the rating of two independent credit-rating agencies and have to meet the same credit limits as those of other bank customers. The requirement that all debt contracts be *registered* with the SHCP was maintained. The intention of these changes was to impose a hard budget constraint on subnational governments while being consistent with a gradual move toward more autonomy. However, the effectiveness of the new framework will depend on how it is implemented. In particular, in order to ensure the credibility of the new framework, it will be important for the federal government to avoid any bailouts when and if the framework is put to the test. This risk has been reduced by the establishment of escrow accounts that use transfers from the federal government as collateral for the loans received by subnational governments.

15. **The fiscal ROSC identified room for improvement in budgetary and reporting practices of states and municipalities**. Deficiencies in data reporting and transparency are apparent in the time lag with which budget performance statistics of states are available in the IMF's Government Finance Statistics (more than 18 months).

16. **The federal government is leading a series of initiatives to improve budgetary systems, accounting practices and public reporting of fiscal information.** A Committee of Secretaries of Finance of the states meets regularly with staff from the SHCP to coordinate initiatives and assess progress. In addition, to promote fiscal transparency at the subnational level, the SHCP requires that debt and fiscal statistics for the previous year be published and that the state is not in arrears with federal development banks in order to register new debt contracts. Improving fiscal statistics at the subnational level will be critical for the new regulations regarding subnational debt in order to allow fully informed credit assessments by market participants. The federal government will need to continue working closely with states on this front.

17. **Subnational governments do not pose a significant risk to macroeconomic performance .** Their relatively low level of indebtedness and their circumscribed financial autonomy has helped maintain fiscal stability. In addition, since the *participaciones* are fully linked to federal government tax revenue, these transfers will adjust automatically in the event of a revenue shortfall, forcing states to share the adjustment with the federal government.

D. Central Bank Operations

18. **Monetary policy is conducted by an independent central bank**. The Law of the Bank of Mexico (BOM) approved in 1993 establishes that the main monetary policy objective of the BOM is the preservation of the purchasing power of the peso and delineates the role and responsibilities of the central bank. Besides its role in conducting monetary policy, the BOM also regulates the foreign exchange and derivatives markets.

19. **The BOM formally adopted an inflation targeting framework in 2001 in the context of a flexible exchange rate system**[5] and market determined interest rates . Under this framework, the BOM established a medium-term (2–3 years) inflation objective with well-defined annual targets consistent with this objective. The inflation targets refer to the end-year headline consumer price inflation. The medium-term objective was set at around 3 percent by end-2003, with intermediate targets of under 6.5 percent in 2001 and under 4.5 percent for 2002. In July 2002, the BOM formally established the 2003 inflation target at 3 percent and announced that from 2004 onwards it would be maintained at 3 percent with a band of ±1 percent around the midpoint. The target for 2001 was met with considerable margin, marking the third consecutive year in which the inflation objective of the BOM was met.

20. **The Financial System Stability Assessment (FSSA) prepared in 2001 found that the observance of practices relating to the clarity of roles, responsibilities and objectives of the BOM for monetary policy, and to an open process for formulation and reporting monetary policy decisions, were well entrenched both in the legal and regulatory framework, and in practice**. Accountability to the government and to congress is well established and there has been substantial progress in reporting to the public including through the quarterly inflation reports. Accountability to the public would be enhanced by a more detailed disclosure of the BOM's financial statements and its general accounting practices and by reporting the main developments and oversight activities of the payments systems.

21. **The FSSA found that roles and institutional mandates between the government and the BOM are generally well defined** but the asymmetric treatment of the BOM profits and losses—whereby profits are transferred to the government while losses are assumed by the BOM—could erode the BOM's capital, as occurred in 2001. While distribution of profits cannot take place if the distribution reduces its capital in relation to nominal GDP, this restriction is insufficient in the case the BOM incurs in operational losses.[6] Also, the BOM is temporarily absorbing the implicit subsidies involved in the pre-1993 credits extended to public trust funds that it administers as well as losses from the write-off of loans granted to the Bank Savings Protection Fund (FOBAPROA) during the bank crisis. There is, however, a mandate to offset a pre-specified fraction of these expenditures against annual profits prior to transferring the residual to the government.

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[5] The federal government and PEMEX however, sell all their excess foreign currency holdings to the central bank and the BOM sterilizes these purchases. This explains the accumulation of international reserves. Until May 2001, the central bank also accumulated reserves by selling foreign currency put-options.

[6] Nonetheless, the future distribution of profits could only take place after the capital to GDP ratio had been fully reestablished.

22. **The BOM has begun to implement a plan to eliminate remaining credit risks in the payments systems, in line with its objective of complying with the BIS Core Principles for Systemically Important Payment Systems.** In this regard, the BOM has announced to financial institutions a sequence of measures that will be introduced within the next three years. The first of these measures, which was introduced in February 2002, requires that any overdraft in the large value electronic payment system be settled in the same day by using bilateral credit lines provided by other banks. In the last quarter of 2002, additional measures will be introduced to improve the quality of collateral associated with the BOM's credit, and to consolidate the intra-day credit into one payment system from the prevailing three. The BOM is also preparing a legislative proposal that will be presented in 2002 to clarify the bank's legal mandate to supervise the payments system and to increase certainty of payments by eliminating the current practice by which payments could be reversed by court-order up to 270 days after they have taken place.

23. **The BOM is a well-run institution with highly-qualified management and staff,** that is carrying out its institutional mandate effectively in accordance with the law. Its credibility has improved considerably in recent years and the institution is respected and perceived by the public and the government as strong and capable and with good governance practices.

24. **The BOM's increased credibility and its conduct of monetary policy have clearly contributed to macroeconomic stability** in recent years as evidenced by the decline in inflation and real interest rates. Furthermore, the BOM's rapid adjustment of monetary policy in response to the Russian crisis (which induced an increase in interest rates of more than 25 percentage points at the height of the crisis) and its preventive measures in 2001–02, to address potential inflationary pressures notwithstanding a weak economy, are widely and correctly seen as proof of its commitment to price stability. These responses, supported by the flexible exchange rate regime, have also given market participants confidence that major external imbalances in the Mexican economy would not develop.

E. Financial Sector

25. **The FSSA concluded that the financial system has improved its resilience to shocks in recent years and important progress has been made in the implementation of international standards and codes.** As a result, the banking sector is not likely to pose systemic problems. Nevertheless, further actions were recommended to make the banking system more resilient to shocks and to achieve full observance of international standards.

26. **Financial sector supervision has been significantly upgraded**, with the National Banking and Securities Commission (CNBV) now having improved technical capacity to identify and monitor the risks taken by banks. New supervisory tools have been developed, and the information technology systems have been upgraded in order to conduct effective off-site examinations. Legislation enacted by congress in April 2001 enhanced further the supervisory powers of the CNBV through improving cross-border supervision; allowing it

to establish regulations for financial conglomerates; and introducing a system of prompt corrective actions that will provide the authorities with adequate tools to deal with problem banks in a timely and transparent manner. The reforms also restricted related lending; improved corporate governance; provided an adequate legal structure for conducting internet banking operations; and provided an appropriate structure for the development of mutual funds.

27. **The regulatory framework has been amended to comply with best international practices.** Regulations have been introduced that limit ad hoc forbearance and require its full disclosure in bank's audited financial statements; new rules for loan-portfolio classification; requirements on overall risk management practices; and rules on internal controls that resemble best international practices. In addition, a timetable is in effect through end-2002 to bring the Mexican definition of capital to international standards. In May 2002, modifications to banks' capital requirements were introduced (in line with international standards) that are aimed at following-up on the 2001 financial reform. The new requirements also aim at reactivating credit in the housing sector and modifying the treatment of certain credit card operations.

28. **Indicators of bank soundness have improved substantially.** The banking sector has strengthened its capital base in the last three years, in part reflecting debt restructuring operations, as well as increased foreign participation. Practically all banks already meet the requirements of regulatory capital that will be in effect at the beginning of 2003. Broad-based lending to the private sector still needs to recover from recent lows in order to reinvigorate the financial intermediation role of banks, and to diversify their profits base by making them less dependent on income from holdings of government securities.

29. **Stress simulations indicate that a scenario that combines a sharp slowdown in economic activity, a depreciation of the peso, and a rise in domestic interest rates would be detrimental to banking system capital and profitability.** Although a depreciation of the peso would have a positive effect on banks' net worth given the positive net foreign exchange position of the system, this would be more than offset by the effect of higher domestic interest rates on bank's balance sheets and the rise in credit risk. However, given the large participation of strong foreign banks, the still low participation of banks in financial intermediation, and the recent strengthening of capital, the banking system should not pose a systemic risk to the Mexican economy.

30. A **"Committee for Modernization,"** led by the Deputy Secretary of Finance, and composed of senior officials of the relevant government agencies as well as key private sector participants has been established to set priorities and foster consensus for additional financial sector reforms in the wake of the recommendations made in the FSSA (see Chapter II for a discussion of these reforms).

31. **Mexico was found to be in compliance with three out of the five international standards and codes covering the financial sector** (transparency of monetary and financial policies, and standards and codes in the insurance and securities markets). Several

deficiencies were found in compliance with the Basel Core Principles for effective bank supervision and the standards for payments systems. The authorities have developed an action plan—which is already being implemented—aimed at achieving compliance with international standards in these areas.

32. **A remaining impediment to adherence of the Basel Core Principles concerns the fragmentation of powers and insufficient coordination across the various agencies responsible for bank supervision**. In this regard, the "Committee for Modernization" has established a working group that is reviewing coordination among agencies; the division of labor on supervision matters among the relevant agencies; and issues related to the CNBV's autonomy, accountability, and corporate governance. The regulatory framework was further amended last year by establishing minimum guidelines for banks' internal controls; and harmonizing regulations of state-owned development banks with that of private banks.

33. **An important vulnerability facing the banking system that was noted by the FSSA is the need for a proper exit strategy**. The current system is heavily biased toward an open-bank resolution approach (whereby troubled banks are kept open during the restructuring process), which will become increasingly inconsistent with "a least cost resolution" strategy under the gradual elimination of universal deposit guarantee. To address this situation, the authorities intend to introduce a framework more consistent with a least-cost resolution approach, which would streamline all the phases of a resolution process, ranging from prompt corrective action to potential liquidation, open-bank assistance or purchase and assumption transactions. Draft legislation could be sent to congress in late 2002 or early 2003.

VI. Assessing Fiscal and External Sustainability: The Case of Mexico

A. Introduction

1. Assessing debt sustainability is of key importance in Fund surveillance. If a country finds itself in a situation where its debt—under reasonable assumptions—cannot be financed, a policy correction would be called for, independently whether this lack of sustainability derives from an insufficient market confidence ("liquidity") or a lack of sufficient net income to service the debt in the long term ("solvency").

2. While sustainability assessments have for some time been standard in Fund surveillance, the Executive Board recently called for introducing greater discipline and consistency in the staff assessments of fiscal and external sustainability. The approach, which is described in "Assessing Sustainability," SM/02/166, is based on two main elements:

- a detailed articulation of the staff's baseline medium-term scenario with clearly spelled-out assumptions and including a decomposition of the historical and projected debt dynamics; and

- a standard set of sensitivity tests around the medium-term baseline scenario, examining the implications of alternative assumptions on debt dynamics.

The framework is, however, by no means considered exhaustive and can be usefully complemented by other types of tests such as specific adverse scenarios and/or short-term stress tests.

3. This chapter reports on the sustainability analysis that the staff has undertaken in the context of its surveillance work on Mexico. Section B contains a detailed description of the staff's baseline medium-term scenario and its debt dynamics as well as the standard sensitivity tests proposed in SM/02/166 for assessing external and public debt sustainability.

4. The standardized debt sensitivity analysis around the baseline scenario is complemented in Section C with a series of stylized stress tests of the potential short-term effect that a repeat of historical capital account crises would have on Mexico's balance of payments. The main conclusions of both exercises are summarized in Section D.

B. Medium-Term Baseline Projections and Sensitivity Tests

5. This section presents detailed assumptions underlying the staff's baseline scenario. It also includes a set of stylized projections of the external and public debt based on historically observed averages and sensitivity tests analyzing the effects of variations in the underlying assumptions on the debt dynamics.

6. The staff's baseline scenario is predicated on partial implementation of the government's structural reform agenda and assumes an average potential growth rate of

4¼ percent during 2002–07,[1] a widening non-interest current account deficit and substantial inflows of foreign direct investment and other non-debt-creating flows. The domestic real interest rate is projected to be about 5 percent (compared with about 6.2 percent in 2001–02) and the implied external real interest rate averages 5¾ percent over the projection period.

7. In line with standard assumptions used for the World Economic Outlook, the real exchange rate is assumed to remain unchanged at its end-June 2002 level. The oil price evolves in line with futures prices until 2003 and remains unchanged thereafter, implying a 14 percent decline in nominal terms in the oil price over the projection period.

Fiscal debt projections

8. The fiscal baseline scenario is based on a passive revenue scenario (without tax reform) and the assumption that the authorities continue to adjust programmable expenditure in order to comply with their medium-term fiscal targets of reaching a surplus in the traditional budget definition of about ½ percent of GDP by 2006:[2]

- The revenue elasticities of the VAT and the income tax with respect to GDP are assumed to be one. Nonrecurrent revenues are projected to decline from about 0.8 percent of GDP in 2002 to 0.2 percent of GDP a year on average for 2003–07 as privatizations taper off; revenue gains from improved tax administration are set at 0.1 percent of GDP a year during 2003–07.

- The oil revenue projection is based on an export volume increase of 32 percent on the basis of planned investments by PEMEX (including through PIDIREGAS[3]) and in line with the authorities forecast.

- On the expenditure side, wages are assumed to grow in line with nominal GDP. PIDIREGAS financing requirements are projected broadly in line with the authorities' intentions.

9. The staff's baseline scenario implies a decline in the public-debt-to-GDP ratio of about 6 percentage points between 2002–07. The decomposition of the baseline debt dynamics is presented in Appendix Table I at the end of this chapter. The exercise shows that the decline in the public-debt-to-GDP ratio is supported by a 1½ percentage point of GDP improvement in the primary balance (Appendix Table I, line 6), while the interest cost of the debt (line 16) is to a large extent offset by the favorable effect of nominal GDP growth on the

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[1] The average annual growth rate was 4¾ percent during 1997–2001 and 3¼ percent during 1991–2001.

[2] Implying a net PSBR of less than 2 percent of GDP.

[3] PIDIREGAS are public investment projects financed and executed by the private sector with deferred budgetary impact.

debt ratio (lines 17 and 18). The residual of the baseline decomposition is small and fully explained by valuation changes to the debt stock due to the exchange rate movements.

10. The robustness of the projected public debt dynamics was tested by applying to the baseline scenario the set of standardized sensitivity tests proposed in SM/02/166. The recalibration of the baseline paths of real GDP growth, the primary balance, the effective nominal interest rate[4] and the growth rate of the GDP deflator in line with the averages of the past five years does not significantly alter the debt dynamics (Appendix Table I, line 20). At the end of the projection period, the public-debt-to-GDP ratio is about 3 percentage points of GDP lower than in the baseline. This is explained by the fact that that the baseline scenario assumptions are slightly lower (more conservative) than the historical averages for real GDP growth, augmented primary balances and nonrecurrent revenues (Table 1 below).

Table 1. Mexico: Historical versus Baseline Scenario Parameters

	Baseline Average 2002–07	Historical Average 1997–2001	Historical Std. Deviation 1997–2001
Augmented primary balance (percent of GDP)	1.2	1.3	0.9
Privatization receipts (percent of GDP)	0.3	0.6	0.3
Real GDP growth (percent)	4.2	4.4	1.5
Effective nominal interest rate (percent)	8.3	18.5	5.3
Effective real interest rate (percent) 1/	4.8	1.5	1.8
GDP deflator growth (percent)	3.5	13.2	4.8

Source: Fund staff computations based on annual data from the Ministry of Finance and Public Credit (SHCP).

1/ Effective nominal interest rate deflated by GDP deflator growth.

11. The standardized sensitivity tests set out in SM/02/166 consider the application of two-standard-deviation shocks to the historical averages of each of effective nominal interest rate, real GDP growth, GDP deflator and augmented primary balance during the first two years of the projection period, while maintaining baseline assumptions for all other parameters. However, a number of pilot exercises (including Mexico) have shown that an isolated shock to the effective nominal interest rate may result in the simulation of real interest rate shocks that are unrealistically large.[5] To overcome this problem the staff

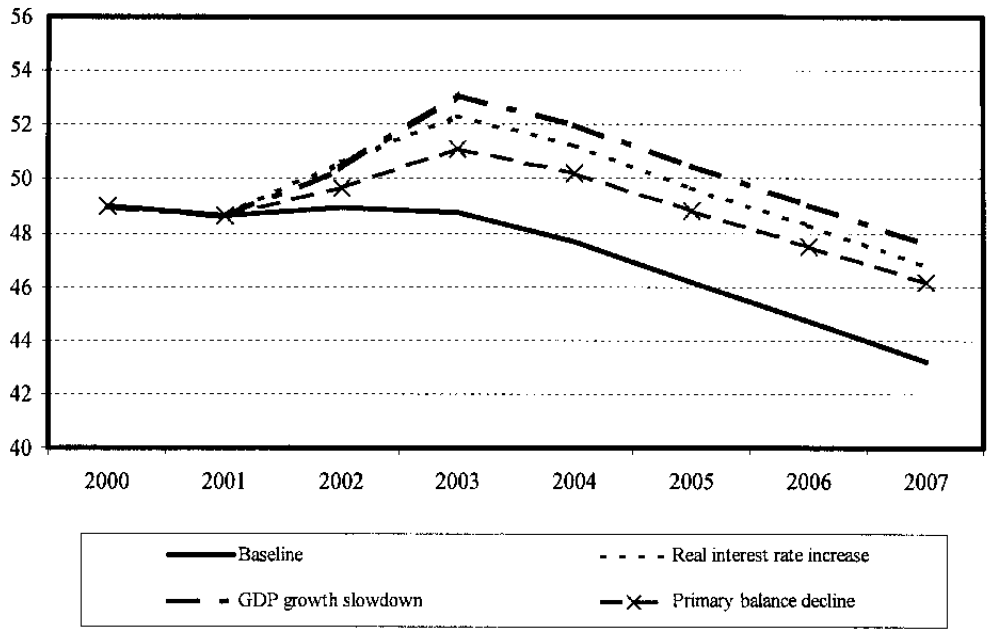
[4] The effective nominal interest rate is obtained by dividing the total annual interest cost of the public sector debt by the total stock of public debt at the end of the previous year.

[5] This problem is particularly acute in countries where nominal interest rates have experienced a sharp downward trend in recent years (e.g., because of rapid disinflation), as has been the case in Mexico, Brazil, and to some extent, Turkey.

replaced the nominal interest rate shock with a two-standard-deviation shock to the effective real interest rate.[6]

12. Figure 1 shows the results from this exercise. The debt-to-GDP ratio would suffer most from isolated negative shocks to the effective real interest rate (Appendix Table I, line 21) and real GDP growth (line 22). Two-standard-deviation shocks (for two years) to these variables would lead to an increase in the debt-to-GDP ratio of around 4 percentage points over the baseline projection.

Figure 1. Sensitivity of Gross Public Debt
(In percent of GDP)



Note: Effect of negative two-standard-deviation shocks on the effective real interest rate, real GDP growth, GDP deflator growth, and the augmented primary deficit on baseline medium-term debt dynamics.

13. If the negative shocks to the effective real interest rate, real GDP growth and the augmented primary balance were to occur simultaneously, the public debt-to-GDP ratio would suffer more significant increases (Appendix Table I, lines 25 and 26). However, the debt dynamics would still turn around once the impact of the shocks fades. The same is true for a one time 10 percentage point of GDP increase in the debt ratio (line 28), which is intended to simulate the hypothetical materialization of contingent liabilities of the public sector.

[6] Because effective real interest rates were relatively low ex post in the mid/late 1990s—probably due to the still relatively high inflation—the staff constructed the two-standard-deviation shock relative to the variable's baseline value instead of its historical average.

14. The stress tests presented in this section assume unchanged fiscal policies in reaction to adverse shocks. However, as noted in Chapter V of the Selected Issues, the Mexican authorities have a solid track record of adjusting public expenditure in response to adverse developments. If the simulated shocks were to materialize, such adjustments would improve the primary balance and could offset part of the upward pressure on the debt-to-GDP ratio. In addition, the methodology of the stress test exercise is not suited to capture a number of changes to the structure of Mexico's public debt, which have reduced vulnerability in recent years. These include, for example, the lengthening of the average maturity of the public debt stock and the broadening of the investors base to include a larger proportion of high grade investors.

External debt projections

15. As noted above, the baseline scenario is based on the assumption of a moderate implementation of the planned reforms and the continuation of the current stability-oriented macroeconomic policies. Mexico is, thus, expected to continue to attract foreign direct investment and equity based portfolio investment (about 70 percent of the external current account deficit and 2½ percent of GDP); the country risk premium is expected to stay low (about 200 basis points); and the non-interest current account deficit is expected to widen to about 1½ percent of GDP, reflecting a sustained demand for capital goods and a relative high level of the real exchange rate. The assumptions underlying the baseline scenario are spelled out in the lower part of Appendix Table II and in Table 2.

Table 2. Mexico: Historical versus Baseline Scenario Parameters

	Baseline Average 2002–07	Historical Average 2002–07	Historical Average minus/plus 1 STD	Historical Average minus/plus 2 STD
Non-interest external current account deficit	-1.5	-0.3	-1.2	-2.1
Implicit external interest rate	7.0	7.8	8.1	8.5
GDP deflator (US$)	1.8	0.0	-5.3	-10.6
Real GDP growth	4.2	4.4	1.5	-1.3

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

16. It was, moreover, assumed that Mexican goods will continue to gain market shares in world markets, particularly in the United States, as the increased capital stock and structural reform translates into higher relative productivity growth and economic integration is deepened. After an initial period when imports of goods and services are expected to exceed exports of goods and services, exports and imports are expected to expand by about the same amount, with imports of capital goods remaining dominant throughout the period. Family remittances of U.S. based Mexican workers—which constituted about 70 percent of oil exports in 2001—are expected to remain about constant at 1½ percent of GDP.

17. As can be seen from Appendix Table II, after an initial small increase in 2002 and 2003, the baseline projection implies a modest reduction in the external (public and private) debt-to-GDP-ratio to below 27 percent in 2007. The decomposition of the change in the debt ratio shows that this profile largely reflects a negative contribution to external indebtedness from the high non-debt-creating flows (mainly foreign direct investment) amounting to about 2½ percent of GDP throughout the projection period (line 5), exceeding the non-interest current account deficit by about 1 percent of GDP a year (line 4).

18. The standard sensitivity tests performed in Appendix Table II reveal that the baseline external debt projection is quite sensitive to assumptions on the size of the primary current account deficit, non-debt-creating inflows, the level of the interest rate, the real growth rate, and the GDP deflator in U.S. dollar terms (heavily affected by changes in the real exchange rate). Using five-year historical average values of the above parameters would, however, result in an even more rapid reduction in the ratio of external debt to GDP. The rapid decrease in the external debt to GDP ratio mainly reflects the historical high level of non-debt-creating inflows and low primary current account deficit (see Table 2).

19. The set of sensitivity tests shows that in none of the analyzed cases, the external debt-to-GDP ratio would increase beyond 40 percent. The most pronounced increase in the debt ratio would occur if the GDP deflator were to experience a one-time decrease of 30 percent, reflecting, for example, a sharp real devaluation of the peso (which were not accompanied by a reduction in the projected current account deficit).[7] In this case the debt–to-GDP-ratio would peak at about 36 percent in the year of the depreciation, followed by a gradual reduction to about 33 percent of GDP. A smaller, but still significant increase would be experienced in the case of a simultaneous one-standard-deviation shock to all of the parameters lasting for two years (line 17).

C. Stress Test Based on a Repeat of Historical Capital Account Crises

20. In order to complement the medium-term debt projections presented above, the staff prepared a set of stress tests based on a stylized replay of previous capital account crises, notably the 1995 Mexico crisis (the "Tequila crisis"), the 1998 Russia crisis, and the 1999 Brazil crisis. These tests attempt to evaluate the size of a potential balance of payments financing gap if the above crises were to reoccur.

Historical crisis: key features

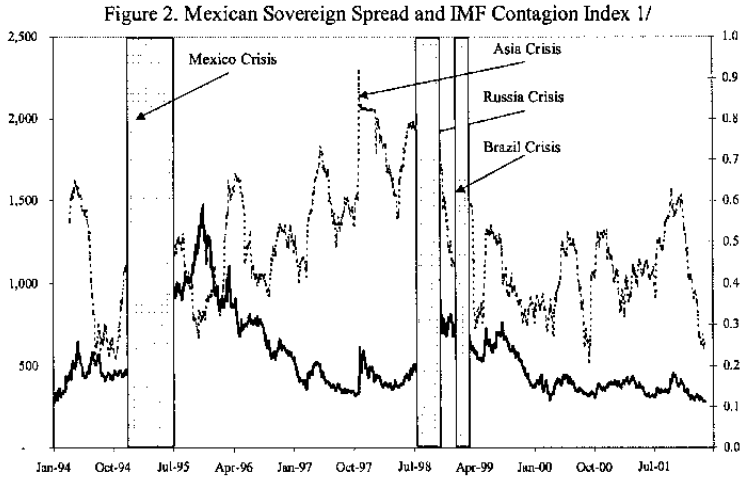
21. The historical episodes that were used as a basis for the stress test simulations can be broadly separated into two groups: the Russia and Brazil crises, on the one hand, and the Mexico 1995 crisis on the other. While the Brazil and Russia crises were examples of

[7] This shock is a standard shock that may not be very relevant in the case of Mexico as a 30 percent devaluation should result in a significant increase in the peso value of oil exports, which—unless offset by a similar increase in domestic absorption—should result in a durable reduction in the current account deficit.

relatively pure financial market contagion, the "Tequila crisis" was triggered mainly by inappropriate domestic policies.

22. Mexico's 1995 crisis stands out as the most severe in terms of the response of domestic interest rates and the exchange rate: domestic short-term interest rates peaked at 84.6 percent (an absolute increase of 7,000 basis points) and the exchange rate collapsed by more than 50 percent associated with the abandonment of the currency band (Table 3). The response of interest rates and the exchange rate was also significant during the Russia crisis when domestic interest rates reached a maximum of 46 percent (an increase of 2,400 basis points), and the peso depreciated by 16 percent at the peak of the crisis. During the Brazil crisis, the increase in domestic interest rates was also significant (2,800 basis points), but the peso only depreciated by 8 percent. As shown in Figure 2, the Mexico crisis had also the largest effect on external bond spreads.

Figure 2. Mexican Sovereign Spread and IMF Contagion Index 1/



Sources: J.P. Morgan and Fund staff estimates for Contagion Index.

23. According to balance of payments data, residents' assets abroad as well as errors and omissions did not show any clear sign of substantial resident "capital flight" (in terms of an increase in residents holdings of foreign assets) in any of the crises. This could reflect data problems but also the fact that private agents behavior was positively affected by the anticipation of large international support (Mexico 1995) or the drawdown of private contingent credit lines (Russia). Significant portfolio outflows were, however, recorded, in particular in the case of the Mexico 1995 crisis, which mostly reflected nonresidents' reduction in their Mexican exposure as they, in part, refused to rollover maturing dollar-denominated domestic debt.

Table 3. Stress Test Scenario Assumption

	Historical				Scenarios		
	Mexico 1995	Asian Crisis	Russian Crisis	Brazilian Crisis	Mexico 1995	Russia Replay	Brazil Replay
Start date	12/16/1994	10/22/1997	7/27/1998	1/6/1999	4/1/2002	4/1/2002	4/1/2002
End date	7/12/1995	12/10/1997	11/27/1998	3/12/1999	10/24/2002	7/30/2002	6/6/2002
Number of quarters	2.29	0.53	1.33	0.73	2.29	1.33	0.73
FDI (year-on-year decline)							
Crisis quarters	-19.7%	-25.0%	-28.1%	18.3%	-19.7%	-28.1%	baseline
Crisis quarters +1	-19.9%	14.0%	27.0%	11.4%	-19.9%	27.0%	baseline
Min rollover ratios (in percent of amortization)							
Bonds (crisis quarters)	45%	40%	32%	258%	45%	32%	100%
Bonds (crisis quarter+1)	135%	373%	77%	416%	100%	77%	100%
Loans (crisis quarters)	26%	177%	570%	172%	26%	100%	100%
Loans (crisis quarter+1)	550%	1559%	103%	183%	100%	100%	100%
Portfolio outflows (in US$ million)							
Local fixed income (avg. mat 3-months)	-8200	-816	-629	-197	-1943	-882	-421
Stock of foreign investment (sop)	21101	3999	3567	2339	5000	5000	5000
Relative to stock	-38.9%	-20.4%	-17.6%	-8.4%	-38.9%	-17.6%	-8.4%
Equities	-1327	-1755	-1537	180	-2163	-1818	0
Stock of foreign investment (sop)	13232	29287	18239	13162	21570	21570	21570
Relative to stock	-10.0%	-6.0%	-8.4%	1.4%	-10.0%	-8.4%	1.4%
Local capital flight	0	0	0	0	0	0	0
Percent flight	0	0	0	0	0	0	0
Private sector holding of financial assets (excl. PF)	..	..	..	..	58500	58500	58500
Total max Outflows	-9527	-2571	-2166	-17	-4106	-2699	-421

Source: Bank of Mexico; and Fund staff estimates.

The balance of payments gap

24. The balance of payments stress test proceeded in two steps. First, a " financing gap" was estimated on the basis of assumptions of, amongst other things, reduced market access, unchanged external current account deficit, and no change in international reserves. Thereafter, the estimated "financing gap" was compared to the size of international reserves or what may be considered as a reasonable adjustment in the current account, either as a result of a deprecation of the exchange rate or contraction in domestic demand (e.g., fiscally induced). It should be noted here that the calculation of the financing gap takes the current account deficit and the size of international reserves as a given only because these variables are considered as adjustment variables. Admittedly, this appears a bit artificial since, in the real world, of course, all these things happen simultaneously and are jointly determined. The separation in two distinct steps is, however, a reasonable way to proceed in the case of relatively pure capital account shocks of the contagion type, which appear to be more of a quantity rationing phenomenon than based on considerations of marginal costs and values (e.g., the availability of finance as measured by rollover rates etc. is not considered to be very sensitive to a change in the exchange rate).

25. It should be noted, nevertheless, that the estimated financing gap is not fully independent of policy actions. The observed rollover rates, foreign direct investment, portfolio flows, as well as exchange rate and interest rate developments are to a large extent a result of the policy actions that were taken during the crisis periods, in terms of macroeconomic or structural policies. Thus, by basing our simulations on historical observed availability of external finance, we implicitly assume that the current administration will be in a position to take similar policy action as the former administration did during the observed crises.

26. Besides the technical assumption of a current account deficit at its baseline level, the unchanged exchange rate, and no change in reserves, the quantitative simulations of the potential external financing gap were based on the following assumptions:

- Bond and loan rollover rates were assumed to be equal to the ones observed in the crisis;
- Portfolio outflows were assumed to be equal to the outflows experienced during the historical crises in percent of the stock of foreign holdings of Mexican assets;
- Foreign direct investment was assumed to fall by the same amount in percentage terms in relation to the baseline scenario as observed in these crises; and
- No domestic capital flight (measured as sharp increase in residents holding of foreign assets) was assumed since there is no clear evidence of such flight in the historical data.

27. Based on the above assumptions together with estimates of the gross financing need over the three quarters from mid-2002, the staff estimated that the potential financing gap would vary between US$3 billion in the case of a replay of the Brazil 1999 crisis and US$16 billion in the case of a replay of Mexico 1995 (Table 4). Although a large part of this adjustment could be taken by contracting the current account deficit through a combination of fiscal contraction and exchange rate depreciation, some reduction in international reserves would seem necessary. This should, however, not cause any concern since in all of the cases the estimated financing does not exceed 50 percent of total international reserves.

28. Although apparently not a salient feature in the historical crises, resident capital flight is possible and may be underestimated in the historical data. More than half of the outstanding stock of liquid assets amounting to about US$58 billion (sight deposits plus government securities not held by pension funds) would, however, need to move into foreign assets in order to fully deplete the central bank of Mexico's international reserves.

D. Conclusions

29. The staff's vulnerability assessment shows that the baseline medium-term external and public debt-to-GDP dynamics are relatively robust to alternative assumptions about the underlying macroeconomic variables. Reverting to historical values for these variables instead of the assumptions in the baseline would not lead to very significant changes in the projected debt levels in the medium term.

30. Additional temporary negative shocks on the underlying macroeconomic variables would lead to some increases in the level of public and external debt. The sensitivity analysis shows that a combination of slower economic growth and higher interest rates would result in an increase in both the overall public sector and external debt to GDP ratios. However, even with the most severe shocks that were simulated both public and external debt ratios would return on a declining trend once conditions return to the baseline state.

31. Stress tests of the potential financing gap arising from a sharp reduction in external finance in line with earlier capital account crisis suggest that the potential financing gap, in the absence of major resident capital flight, could relatively easily be financed by the use of international reserves and other supportive policies. Moreover, more than half the amount of non-institutional holdings of liquid assets would have to switch abroad to create capital flight of a magnitude sufficiently large to fully deplete international reserves.

Table 4. Mexico: Sources of the BOP Gap
(In U.S. million, three quarters)

	Mexico 1995	Russia 1998	Brazil 1999
Difference current account	0	0	0
Current account deficit baseline	-15,411	-15,411	-15,411
Current account deficit scenario	-15,411	-15,411	-15,411
Difference FDI	-3,903	-3,181	0
FDI baseline	11,000	11,000	11,000
FDI scenario	7,097	7,819	11,000
Difference in rollover of ST debt	-3,821	-3,205	0
Net issuance of ST debt baseline	0	0	0
Net issuance of ST debt scenario	-3,821	-3,205	0
Difference in rollover of MLT debt	-5,290	-5,073	-2,740
Net issuance of MLT debt baseline	2,740	2,740	2,740
Net issuance of MLT debt scenario	-2,550	-2,333	0
Difference in portfolio flows	-2,807	-2,110	-17
Other net capital flows baseline	172	172	172
Other net capital flows scenario	-2,635	-1,938	155
Total	-15,821	-13,569	-2,756

Source: Bank of Mexico; and Fund staff estimates.

APPENDIX TABLE I

Mexico: Public Sector Debt Sustainability Analysis

		2000	2001	2002p	2003p	2004p	2005p	2006p	2007p	Average 2002–07
A. Public debt dynamics decomposition: baseline (in percent of GDP)										
Line 1	Gross public sector debt	49.0	48.6	48.9	48.8	47.7	46.2	44.7	43.2	46.6
Line 2	*Of which*: foreign currency denominated	17.3	15.9	16.5	17.5	17.8	17.9	18.0	18.0	17.6
Line 3	*Of which*: local currency denominated	31.7	32.7	32.38	31.2	29.9	28.3	26.7	25.2	29.0
Line 4	Change in gross public sector debt from previous period	-1.8	-0.3	0.26	-0.1	-1.1	-1.5	-1.4	-1.5	-0.9
Line 5	Net debt-creating flows	-5.0	0.7	-0.06	-0.9	-1.3	-1.8	-1.7	-1.8	-1.2
Line 6	Augmented primary deficit 1/	-1.2	-0.8	-0.26	-1.1	-1.2	-1.7	-1.8	-1.9	-1.3
Line 7	Total revenue 2/	21.1	21.1	21.8	21.5	21.2	21.0	20.7	20.6	21.1
Line 8	Total expenditure 3/	24.7	24.9	25.4	24.5	23.6	22.9	22.5	22.2	23.5
Line 9	Total primary expenditure	19.8	20.3	21.5	20.5	20.0	19.3	18.9	18.8	19.8
Line 10	Total interest cost 4/	4.9	4.6	3.9	4.0	3.6	3.7	3.6	3.5	3.7
Line 11	Non-debt-creating inflows	0.4	0.7	0.8	0.2	0.2	0.2	0.2	0.2	0.3
Line 12	Nonrecurrent revenue (including privatizations)	0.4	0.7	0.8	0.2	0.2	0.2	0.2	0.2	0.3
Line 13	Total interest rate and GDP growth effect ((i-g-(p+pg))/(1+g+p+gp) * D)	-3.3	2.2	1.0	0.4	0.0	0.2	0.4	0.3	0.4
Line 14	Adjustment factor (1+g+p+gp)	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Line 15	Combined interest rate and GDP growth effects ((i-g-(p+pg)) * D)	-4.0	2.4	1.0	0.4	0.0	0.2	0.4	0.3	0.4
Line 16	Nominal interest cost (i* D)	5.9	4.9	4.1	4.4	3.9	4.0	3.9	3.7	4.0
Line 17	Real GDP growth effect (-g* D)	-3.4	0.1	-0.7	-2.0	-2.3	-2.2	-2.0	-1.9	-1.9
Line 18	Inflation effect (-(p+pg) * D)	-6.5	-2.6	-2.4	-2.0	-1.6	-1.6	-1.5	-1.5	-1.7
Line 19	Residual	3.1	-1.0	0.3	0.7	0.2	0.2	0.2	0.2	0.3
B. Sensitivity analysis of public debt-to-GDP-ratio 5/										
Line 20	If effective nominal interest rate, real GDP growth, GDP deflator growth primary balance and nondebt flows are at five-year average	49.0	48.6	47.2	46.2	44.6	43.1	41.6	40.0	43.8
Line 21	If effective real interest rate in year t and t+1 is on baseline plus 2 STD	49.0	48.6	50.6	52.3	51.2	49.7	48.3	46.8	49.8
Line 22	If real growth in year t and t+1 is on average minus 2 STD	49.0	48.6	50.4	53.1	52.0	50.5	49.1	47.6	50.4
Line 23	If GDP deflator in year t and t+1 is on average minus 2 STD	49.0	48.6	49.5	49.5	48.4	46.9	45.5	43.9	47.3
Line 24	If augmented primary balance in year t and t+1 is on average minus 2 STD	49.0	48.6	49.6	51.1	50.2	48.8	47.5	46.1	48.9
Line 25	Combined one-standard-deviation shock to real GDP growth, effective real interest rate and primary balance	49.0	48.6	49.6	52.2	51.1	49.6	48.2	46.7	49.6
Line 26	Combined two-standard-deviation shock to real GDP growth, effective real interest rate and primary balance	49.0	48.6	52.9	59.1	58.0	56.5	55.2	53.7	55.9
Line 27	One time 30 percent depreciation in t, everything else at baseline except primary deficit	49.0	48.6	53.4	53.3	52.2	50.7	49.3	47.8	51.1
Line 28	Increase of debt ratio in t by 10 percent of GDP	49.0	48.6	58.9	58.9	57.8	56.3	54.9	53.5	56.7

Sources: Ministry of Finance and Public Credit (SHCP); Bank of Mexico; and Fund staff estimates.

1/ Negative value indicates surplus.

2/ Budgetary revenue excluding nonrecurrent income, capital gains on debt buy-backs and premia on par bonds.

3/ Budgetary expenditure + PIDIREGAS financing requirement + IPAB financing requirement+ FARAC financing requirement + development banks financing requirement + inflation component of indexed bonds + reserves of IMSS and ISSSTE + debtor support programs.

4/ Budgetary financing cost + accrued interest IPAB + net interest PIDIREGAS + inflation component of indexed bonds + FARAC financing requirement + debtor support programs.

5/ Projection assumes a constant residual at the baseline level.

Symbols: i=effective nominal interest rate; g=real GDP growth rate; p=growth rate of GDP deflator; D=debt-to-GDP ratio; year t=2002; year t+1=2003.

APPENDIX TABLE II

Mexico: External Debt Sustainability Analysis

				Projections					
		2000	2001	2002	2003	2004	2005	2006	2007
1. Baseline scenario									
Line 1	Gross external debt (percent of GDP)	28.4	26.6	27.6	28.6	28.7	28.5	28.3	28.0
Line 2	Gross external (change in debt-to-GDP ratio)	-8.5	-1.8	0.9	1.1	0.0	-0.1	-0.2	-0.3
Line 3	Net debt-creating flows (lines 4-5+6)	-5.6	-3.1	-0.6	-0.3	-0.9	-0.7	-0.7	-0.9
Line 4	Current account deficit, excluding interest payments (percent of GDP)	0.7	0.9	1.1	1.2	1.5	1.7	1.7	1.5
Line 5	Net non-debt-creating inflows (percent of GDP)	2.6	4.0	2.1	2.6	2.6	2.6	2.7	2.7
Line 6	Debt dynamic: (r-g-(ρ+gρ))/(1+g+ρ+gρ)) debt/GDP (lines (7-8-9)/10)	-3.7	0.1	0.4	1.0	0.2	0.2	0.3	0.3
Line 7	r (interest rate) times debt/GDP	3.0	2.2	1.6	2.0	2.0	1.9	1.8	1.8
Line 8	g (real GDP growth rate) times debt/GDP	2.5	-0.1	0.4	1.1	1.3	1.2	1.1	1.1
Line 9	(ρ + gρ) (ρ = U.S. dollar value of GDP deflator, growth rate) times debt/GDP	5.1	2.1	0.8	-0.2	0.4	0.4	0.4	0.4
Line 10	Adjustment factor: 1+g+ρ+gρ	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1
Line 11	Residual, including change in gross foreign assets/GDP	-2.9	1.3	1.5	1.4	0.9	0.6	0.5	0.6
Memorandum items: Key macro and external assumptions									
	Nominal GDP (billion U.S. dollars) 1/	580.7	617.9	643.3	663.9	706.7	752.1	797.5	845.6
	Real GDP growth (in percent per year)	6.6	-0.3	1.5	4.0	4.8	4.7	4.3	4.3
	Real exchange rate (change, in percent per year)	10.0	8.3	1.5	-2.4	0.0	0.0	0.0	0.0
	Nominal GDP deflator (in U.S. dollars, change in percent per year)	12.6	7.0	2.9	-0.8	1.6	1.6	1.6	1.6
	External interest rate (percent per year)	8.2	7.6	6.0	7.1	7.3	7.3	7.1	7.1
	Oil price (WEO Summer 2002)	26.8	25.0	23.0	22.5	21.5	21.0	21.0	21.0
	Growth of exports of G&S (U.S. dollar terms, in percent per year)	21.3	-4.2	6.8	10.6	11.2	11.8	10.6	11.1
	Growth of imports of G&S (U.S. dollar terms, in percent per year)	22.6	-1.4	5.8	11.8	13.1	12.1	10.3	10.1
2. Sensitivity analysis for external debt to GDP									
Line 12	If real interest rate, real GDP growth rate, US$ GDP deflator growth, non-interest current account 2/ and non-debt flows (in percent of GDP) are at average of past 5 years; real GDP deflator growth is assumed zero.		26.4	24.2	21.6	18.8	16.1	13.3	10.4
Line 13	If interest rate in 2002 and 2003 is average plus two standard deviations, others at baseline.		26.4	27.9	28.6	27.8	27.0	26.3	25.5
Line 14	If real GDP growth rate 2002 and 2003 is average minus two standard deviations, others at baseline.		26.4	28.0	29.9	29.1	28.3	27.6	26.8
Line 15	If US$ GDP deflator growth in year 2002 and 2003 is 0 minus two standard deviations, others at baseline.		26.4	29.2	31.7	30.8	30.1	29.4	28.5
Line 16	If the noninterest current account (in percent of GDP) in year 2002 and 2003 is average minus two standard deviations.		26.4	27.3	28.6	27.7	27.0	26.3	25.5
Line 17	Combination of 2-5 using one-standard-deviation shocks. 1/		26.4	28.6	31.1	30.2	29.5	28.8	27.9
Line 18	One time 30 percent depreciation in 2002 (unchanged real exchange rate, thereafter) others at baseline. 1/		26.4	35.5	35.9	35.0	34.3	33.6	32.8

Sources: Bank of Mexico; and Fund staff estimates.

1/ All variables relative to baseline, except the US dollar GDP deflator which is set at zero, as further real appreciation of the peso is considered an unlikely event.
2/ This projection implicitely assumes zero foreign assets accumulation (e.g., increase in international reserves).