Financial System Report

2006

BANCO DE MEXICO

FOREWARNING

CONTENTS

Financial System Report

1.   Introduction

There is a large amount of empirical evidence to suggest that countries with developed financial systems exhibit faster and more sustained economic growth. The reason for this is the significant role of the financial system in providing efficient intermediation between savers and users of financial resources. Besides channeling funds, the financial system provides several other services, one of the most important of which is the operation of payment systems.

Firstly, a developed financial system requires a legal framework that clearly establishes the rights and obligations of all the parties involved. It also needs public entities with sufficient powers to ensure such rights and obligations are respected and fulfilled. Likewise, it is important to have efficient and complete markets where economic agents can distribute their risks conveniently. Finally, it requires efficient and solvent financial intermediaries.

The financial system must also be competitive, in order to contribute efficiently to economic growth. An uncompetitive or limited access financial system may not be capable of properly channeling savings towards socially profitable projects. Such situation would also hamper any economic expansion which would otherwise have been stimulated by efficiency gains.

The Mexican financial system is currently undergoing an important evolutionary process driven by the reform of its legal framework, growing links between commercial banks and non-financial companies, as well as the latter's incursion in traditional banking business. This process is taking place via strategic alliances and companies' investment in financial groups and banks. Such transformation in the financial business environment is not only occurring in the Mexican economy.

The Financial System Report, presented here for the first time, will be published on a yearly basis hereafter. Its aim is to notify any changes in the Mexican financial system, analyze its evolution and solvency, and contribute to informed discussion of financial issues. As this is the first report, the text includes a series of concept and methodology definitions designed to help non-specialized readers. This document mainly focuses on commercial banks, due to their position as the most important financial intermediary.

The report covers several aspects of Mexico's financial system: the macroeconomic environment in which it operates; the sources of its funds; the intermediaries that compose it; the use of these funds; and, the risks it is exposed to as well as its ability to deal with them.

In accordance with the aforementioned topics, the second section of the report describes the domestic and international economic environments. The third section shows the financial sources and uses of funds of the Mexican economy as well as the financial position of

households, companies and the public sector. Subsequently, the fourth section analyzes the debt, exchange, and derivatives' markets. The fifth section studies commercial banks' profitability and solvency, as well as market, credit, liquidity, and contagion risks this sector is exposed together with the results of several competition studies. The sixth section analyzes investment funds specialized in retirement savings (Sociedades de Inversión Especializadas en Fondos para el Retiro, Siefores) and limited purpose non-bank banks (Sociedades Financieras de Objeto Limitado, Sofoles), while the seventh illustrates the main characteristics of large value payment systems and Banco de México's role in them. Finally, the document ends with several final remarks.

2.   International and Domestic Environments

The following section presents a summary of developments in the international and domestic environments during 2006 and the first quarter of 2007, as well as their impact on the Mexican economy and the evolution and stability of the financial system. Several risks threatening the Mexican economy and which might appear in the future are also briefly mentioned.

2.1.   International environment

During 2006, the world economy continued to exhibit vigorous growth and the disparities observed between developed countries' economic growth began to decline. The latter could contribute to a reduction in global current account imbalances. Meanwhile, in the first quarter of 2006, U.S. GDP grew above its annual potential rate and levels registered during 2005. However, such expansion began to weaken in the second quarter of the year in response to a gradual slowing of consumer expenditure and, more particularly, to reduced spending on housing construction.

Economic performance in the euro area improved due to more robust domestic expenditure. Domestic demand continued to recover in Japan, while in emerging Asian economies the robust growth shown in recent years continued. Emerging economies in other regions also registered solid growth driven by the rapid expansion of global trade, ample liquidity in international financial markets and improvements in the terms of trade stemming from higher commodity prices.

In advanced economies inflation continued at moderate levels and inflation expectations remained well anchored despite upward pressures stemming from higher oil and other commodity prices as well as the gradual increase in the use of resources. The evolution of consumer price indexes was greatly influenced by oil market fluctuations. Crude oil prices reached historically high levels during the summer of 2006, then decreased in the second quarter of that year and rebounded again, although more modestly, in the first quarter of 2007.

U.S. core inflation increased slightly, mostly as a result of rises in housing prices. Core inflation indexes in developed nations also partly reflected moderate wage pressures. Although unit labor costs in the U.S. rose moderately during 2006, their growth slowed in the first quarter of 2007. In Japan, the deflationary process of the last few years finally came to an end, while in Europe inflation remained above 2 percent until the third quarter when it fell below such level due to declining oil prices.[1] Although headline inflation has continued to be below 2 percent during the first quarter of 2007, the core inflation index has followed a slight upward trend.

The environment of solid growth and low inflation has helped maintain favorable conditions for emerging economies in international financial markets. Low risk aversion together with improved economic fundamentals and reduced external financing requirements meant sovereign debt spreads continued to decline, reaching historically low levels in April 2007.

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[1]   The European Central Bank has set an annual inflation target of slightly below 2 percent.

The rise in long-term interest rates and increased inflationary pressures in the U.S. at the start of 2006 raised prevailing uncertainty regarding future monetary policy and the target for the federal funds rate (Graph 1a and b). Towards the middle of May the aforementioned factors led to reduced risk appetite which mainly affected emerging economies. The increase in U.S. short-term interest rates, stemming from the Federal Reserve's policy of gradually withdrawing monetary stimulus, was absorbed smoothly until May 2006 when international financial markets went through an episode of turbulence.

Graph 1
U.S. Indicators and Sovereign Risk

a) Yield on U.S. Treasury Bond and Federal Fund Rate   b) Federal Fund Futures   c) Sovereign Risk

Annual percent   Annual percent   Basis points
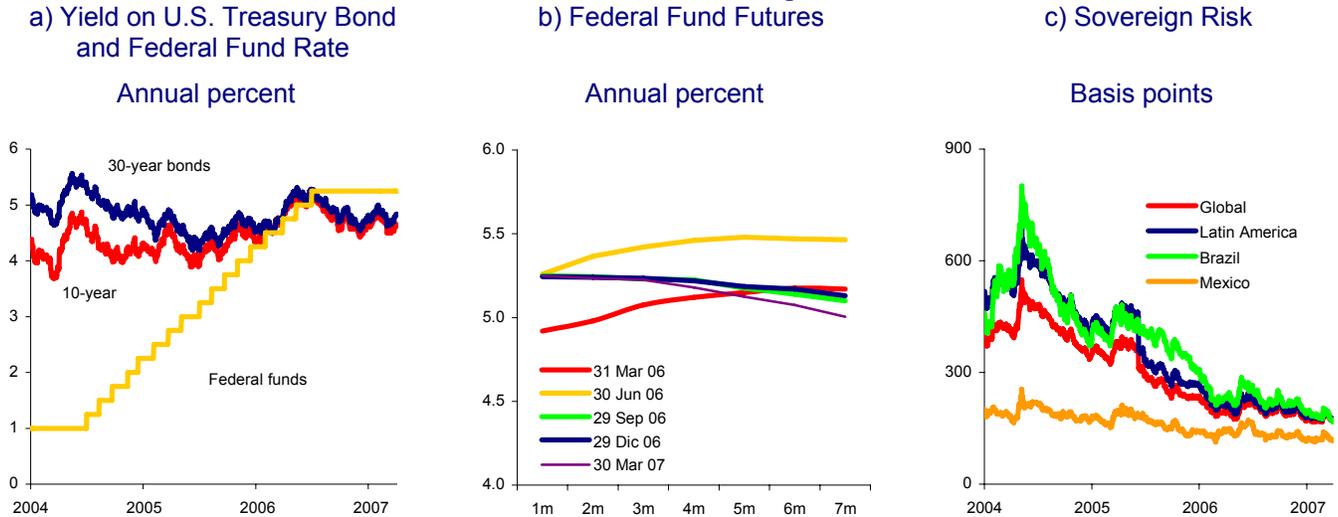
Figures at March 2007.
Source: Federal Reserve and Bloomberg.

It is important to put the abovementioned period of volatility into context, because it was relatively shortlived and did not have significant repercussions on inflation expectations or on most emerging countries' economic growth. Emerging economies' sovereign debt spreads were only slightly affected and recorded only modest increases (Graph 1c) and, although emerging countries' sovereign debt instruments as well as their stock and foreign exchange markets registered more significant corrections, by the end of summer these adjustments had almost reversed. Thus, despite the fact that such period of volatility exposed certain weaknesses in the international financial system, particularly in countries' with high external borrowing requirements, the process was generally contained.

International financial markets experienced a further episode of turbulence at the end of February 2007. On this occasion uncertainty stemmed from, among other factors, a marked deterioration in the U.S. mortgage market, particularly the subprime sector. Concerns that an adjustment in such market would translate into a weakening of aggregate expenditure led to significant movements in stock markets and prices of different risk bearing assets. Nonetheless, the turbulence was shortlived and, just as after the volatility during May 2006, emerging economies' sovereign debt spreads soon recovered their downward path.

The outlook for the world economy is favorable for 2007 and the following year, even though U.S. GDP is expected to continue gradually slowing

down. The economies of Japan and the Euro Area are expected to continue their cyclical recovery, while emerging economies, especially in Asia, are anticipated to continue growing at high rates. Despite the gradual reduction in output gaps in the world's main economies, long-term inflation expectations remain stable.

The aforementioned international environment is subject to several risk factors such as the possibility that weakness in the U.S. housing sector could lead to a larger-than-expected downward adjustment of economic activity. Inflation expectations in advanced nations also face different risks. Rising resource utilization could put greater pressure on core inflation, while oil prices have remained high and danger prevails that geopolitical or other factors could lead to further increases. In an environment where pressures on core inflation are being observed in some countries, the aforementioned could result in even greater monetary restrictions. Finally, it is also important to underline the possible implications of a sudden correction in global current account imbalances (particularly in the U.S. and China) and the consequent adjustment in foreign exchange markets.

2.2.   Domestic environment

Mexico's economic activity expanded much more than expected in 2006, despite the fact that the expansion of GDP and aggregate demand slowed during the second half of the year. GDP growth (4.8 percent in real terms) was accompanied by increased employment, mainly in the formal sector. As for the behavior of domestic demand, the robust growth of consumer spending was noteworthy (5.1 percent), although such expansion weakened towards the end of the year. Investment expenditure recorded strong growth (10 percent), and exports of goods and services rebounded significantly (11.1 percent).

In 2006, just as in the two preceding years, domestic expenditure and production were driven by the oil trade balance surplus, revenues from workers' remittances and increased external demand. Such factors, along with higher employment (Graph 2b), real wage rises in several sectors and the growing availability of financing, fostered the growth of private consumption.

The expansion of GDP in 2006 stemmed from growth in all three of its components: agriculture, industry and services. The recovery of industry responded to the positive behavior of the four sectors that comprise it: manufacturing, construction, electricity and mining. The first three of the aforementioned recorded higher growth than during the previous five years. Manufacturing was bolstered specifically by the automobile industry, mainly by export market production. Regarding the evolution of the external sector, it is important to mention the decline of the current account deficit which amounted to 1.8 billion US dollars at the end of 2006, figure equivalent to 0.2 percent of GDP (Graph 2c). Such reduction responded to increases in the oil trade balance surplus and in revenues from workers' remittances. Persistently high international crude oil prices resulted in a 22.4 percent rise in the value of oil exports during 2006, while non-oil exports grew 15.7 percent in 2006 despite the slowing of external demand towards the second semester of the year. As mentioned previously, the strength of manufacturing exports was driven by the terminal automotive industry, although such exports weakened throughout the last few months of the year.

The growth of GDP and aggregate demand during 2006, also implied a rise in the demand for merchandise imports (15.5 percent increase). The trade balance deficit fell from 7.6 billion US dollars in 2005 to 6.1 billion in 2006 due to higher surpluses in the oil and automotive sectors. Although revenues from workers' remittances amounted to 23 billion US dollars in 2006, the annual growth of this aggregate declined throughout the year. The capital account of the balance of payments exhibited a modest surplus of 1.8 billion US dollars, mainly from FDI inflows, as well as foreign financing for the bank and non-bank private sector and Pidiriegas projects. Meanwhile, the outflow of resources stemmed mainly from a significant reduction in public sector's foreign indebtedness.

Graph 2
**Indicators of Economic Activity in Mexico**

a) Gross Domestic Product

Annual percentage change in constant pesos
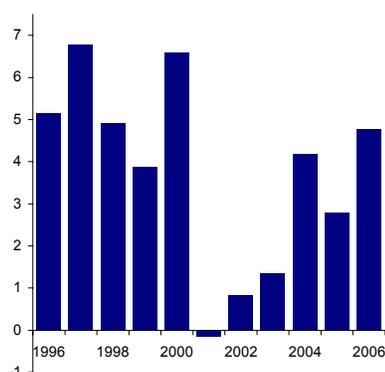
b) Workers Insured by the IMSS

Annual change in thousands of workers
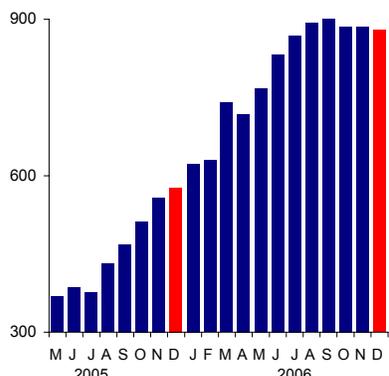
c) Current Account Deficit

Percentage of GDP

Figures at December 2006.
Source: INEGI.

Figures at December 2006.
Source: IMSS.
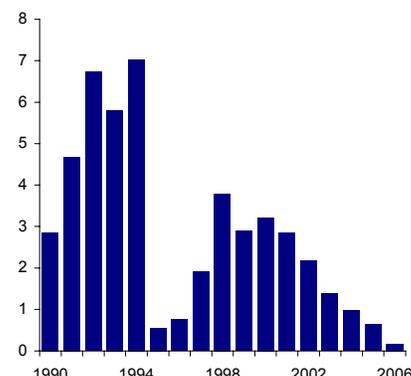
Figures at December 2006.
Source: Banco de México.

So far in 2007 economic expansion has slowed. The incipient signs of a slowdown in GDP and aggregate demand first appeared during the second semester of 2006 and have become more evident throughout the current year. Both domestic and external components of aggregate demand declined during the first quarter of 2007. Regarding domestic demand, the slowing of consumption expenditure which began towards the end of 2006 continued in 2007, while investment grew at a slower rate than during the previous year. In the first quarter of 2007, the growth of exports of goods and services slowed due to a further deceleration of external demand.

The economic slowdown was clearly observed in the behavior of indicators for production and aggregate demand. Regarding external demand, information available at the time of writing this report suggests that the slowdown of U.S. imports, Mexico's main export market, which occurred during the second semester of 2006, intensified during the first few months of 2007. The fact that the U.S. is Mexico's most important trading partner has meant the slowing of external demand from the U.S. These developments have affected Mexican exports, particularly export oriented automotive production. Finally, during the first quarter of 2007, revenues from workers' remittances grew 3.4 percent compared with the same period in the previous year, much lower than the 15.1 percent growth recorded in 2006.

One outstanding aspect of economic activity during the first quarter of 2007 was the meager 0.6 percent annual growth of industrial production. Such result mainly stemmed from a 0.1 percent decline in manufacturing which reflected the contraction in the automotive industry, although non-automotive manufacturing also declined considerably. In general, the aforementioned behavior can mostly be explained by weakening external demand. The modest expansion of economic activity during the first quarter of 2007 was reflected in a reduction in the demand for labor. Thus, at the end of April, formal employment, measured as the number of workers insured by the Mexican Social Security Institute (*Instituto Mexicano del Seguro Social,* IMSS), amounted to 843,637 workers, figure below that observed in September 2006 (900,872 workers).

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Finally, during the first quarter of 2007 the trade balance and current account exhibited deficits, which contrasts with the surpluses both accounts showed during the same period of the previous year. Such results were influenced by reductions in both the oil trade balance and the value of automotive industry exports.

In response to the supply shocks that have affected inflation since mid-2006, at the start of 2007 Banco de México raised its inflation forecast for the rest of that year. Since then, headline and core inflation have generally remained in line with forecasts. Banco de México anticipates that, once the effects of the aforementioned supply shocks dissipate, inflation will recover its downward path towards the 3 percent target, converging closely to it in the following 18 months. In order to consolidate such process, Banco de México tightened its monetary policy stance this past April. Nonetheless, certain risks prevail, basically associated with current and expected international prices of agricultural commodities and their impact on food products, which could threaten the aforementioned projections. Furthermore, although medium-term inflation expectations remain well anchored, they are still above the established target and inflation only has to remain above its variability interval for a long period to increase the danger of price and wage contamination.

3. Financial Position of Households, Firms and Public Sector

The following section reports the financial balances and structure of the private, public and external sectors. The financial position of households, non-financial private companies and the public sector are also studied in more detail in order to illustrate the recent development of savings, indebtedness and debt service in such sectors, as well as their implications for financial stability.

3.1. Sources and uses of funds

3.1.1. Sectorial balances

The financial balances of the public, private and external sectors are extremely useful indicators for evaluating risks associated to an economy's flow of funds. Furthermore, such balances also make it possible to identify changes in economic sectors' net credit and debt positions as well as the destination of financial sources (Table 1).[2]

Table 1
Flow of Funds by Type of Sector[1/]
Flows revalued as a percentage of GDP [2/]

	Average									
	1990-1994	1995-1999	2000-2005	2000	2001	2002	2003	2004	2005	2006
Private Sector's balance [3/]	**4.6**	**-2.9**	**-0.7**	**-0.1**	**-1.1**	**-0.1**	**-1.2**	**-0.8**	**-1.0**	**-0.8**
Domestic				-5.0	-5.1	-3.2	-3.4	-1.9	-2.4	-1.9
Financial instruments				-5.1	-5.9	-3.5	-4.0	-3.9	-4.9	-5.9
Financing				-1.2	-1.9	0.3	0.9	1.2	1.9	2.4
Other financial system items				1.3	2.7	0.0	-0.3	0.7	0.5	1.6
External				4.9	4.0	3.1	2.2	1.2	1.4	1.1
Foreign direct investment				2.7	4.4	2.7	2.0	2.6	2.6	2.3
Net external financing				1.6	-0.2	1.0	0.3	-1.1	-1.0	-1.0
Errors and omissions (Balance of Payments)				0.5	-0.2	-0.7	-0.2	-0.4	-0.1	-0.2
Public Sector's balance [4/]	**0.8**	**4.9**	**2.6**	**3.2**	**3.9**	**2.2**	**2.6**	**1.8**	**1.6**	**1.0**
Domestic				2.8	2.9	2.1	2.2	1.3	1.5	3.0
External				0.4	1.0	0.1	0.4	0.5	0.2	-2.0
External sector's balance (Current Account) [5/]	**-5.4**	**-2.0**	**-1.8**	**-3.1**	**-2.8**	**-2.1**	**-1.4**	**-1.0**	**-0.6**	**-0.2**

Figures at December 2006.
1/ Positive sign = debtor position, negative sign = creditor position. Preliminary figures. Figures may not add up due to rounding.
2/ Excludes the effect of Mexican peso's exchange rate fluctuations vis-à-vis other currencies.
3/ Private sector includes firms, households and non-bank financial intermediaries.
4/ Public sector measured as Public Sector Borrowing Requirements (Requerimientos Financieros del Sector Público, RFSP), including non-recurrent revenues.
5/ Drawn from the current account of the balance of payments. A negative figure means the domestic economy received foreign financing (external sector surplus), which equals Mexico's current account deficit.
Source: Banco de México.

Throughout the last decade, the private and external sectors have maintained a net creditor position, financing public sector's borrowing requirements. Nevertheless, in recent years such balances have undergone the following changes: i) although the private sector has remained a net creditor (0.8 percent of GDP in 2006), its external indebtedness has fallen significantly and the

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[2] Stocks refer to the basic macroeconomic identities expressed as financial flows. The current account equals private savings plus the public deficit.

reduction in its domestic creditor position is due to the fact that this sector has received an increasing flow of domestic resources; and ii) public sector borrowing requirements have dropped considerably in both domestic and external markets. In 2006, federal government operations to substitute external debt for domestic debt led to a greater flow of domestic financing and a reduction in external financing to the public sector. As a result, the Mexican economy currently depends less on external resources as reflected by the considerable decrease in its foreign debt (balance of payments' current account).

3.2. The structure of sources and uses of funds

The structure of sources and use of funds in the economy (Table 2) shows that, at year end 2006, the stock of total resources available to finance Mexican residents, excluding direct foreign investment and the stock market, equaled 72.1 percent of GDP.

Table 2
Sources and Uses of the Economy's Financial Funds
Stocks as a percentage of GDP [1]

	2000	2001	2002	2003	2004	2005	2006	Structure % 2006
Total sources	**65.7**	**69.6**	**69.7**	**71.6**	**68.2**	**68.7**	**72.1**	**100.0**
M4	41.7	47.0	46.4	47.9	46.9	50.4	54.9	76.2
Held by residents	40.8	46.3	45.8	47.3	45.7	48.7	53.0	73.5
SAR [2]	6.6	8.6	9.2	10.1	10.2	11.2	12.1	16.7
Rest	34.2	37.7	36.6	37.2	35.6	37.5	40.9	56.8
Held by non-residents	0.8	0.7	0.6	0.7	1.2	1.7	2.0	2.8
External financing	24.0	22.6	23.3	23.7	21.3	18.4	17.1	23.8
Total uses	**65.7**	**69.6**	**69.7**	**71.6**	**68.2**	**68.7**	**72.1**	**100.0**
International reserves [3]	5.6	6.3	7.5	8.9	8.2	8.1	7.8	10.8
Public sector (PSBR) [4]	40.0	40.5	40.9	41.6	37.9	36.2	35.8	49.7
States and municipalities	1.3	1.3	1.4	1.5	1.5	1.5	1.4	2.0
Pivate sector	29.0	28.2	27.7	27.2	25.6	26.0	29.5	40.9
Households	8.9	9.4	9.7	10.1	10.6	11.6	13.7	19.0
Firms	20.1	18.7	18.0	17.1	15.0	14.3	15.8	21.9
Others [5]	-10.1	-6.7	-7.7	-7.6	-5.0	-3.0	-2.5	-3.4

1/ End of period figures expressed as a percentage of GDP.
2/ Includes securities held by Siefores (excluding external and variable interest assets), workers' housing funds, pension funds from the Government Employees' Social Security Institute (Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado, ISSSTE) and the concentration account.
3/ As defined by the Law governing Banco de México'.
4/ Historical stock of PSBR reported by the Ministry of Finance.
5/ Refers to non-sectorized assets, capital accounts and results, other assets and liabilities of commercial banks, development banks and Banco de México, non-bank financial intermediaries and INFONAVIT, as well as the Bank Deposit Insurance Insitute (Instituto de Protección al Ahorro Bancario, IPAB), and non-monetary liabilities, among others.
Source: Banco de México.

The growth of residents' savings was significant, accounting for 73.5 percent of total resources in 2006 compared to 70.8 percent in 2005 and an average of 65.6 percent during the period from 2000 to 2004. As mentioned in the previous section, there has been a reduction in the dependence on external financing. Thus, at the end of 2006 resources from non-residents represented 19.1 percent of GDP, implying a reduction compared to the levels observed in 2000 (24.8 percent of GDP). It is worth mentioning that, of the 144.8 billion pesos invested by non-residents in the public debt market at the end of 2006, around 87.2 percent corresponded to long-term government bonds at fixed rates. Mexico's lesser reliance on external financing can be mainly attributed to the greater availability of domestic financial savings, which has been driven by: i) a more stable macroeconomic environment, ii) the increasing importance of the

Retirement Savings System (Sistema de Ahorro para el Retiro, SAR); and, iii) stronger economic activity during recent years.

During 2006, the monetary aggregate M4 (a broad measure of financial savings in domestic instruments) recorded an average annual real variation of 9.4 percent. From 2000 to 2005 the average growth rate of this aggregate was 7.9 percent. As a result, financial saving rose from 41.7 percent of GDP in 2000 to 54.9 percent of GDP in 2006.[3] The aforementioned environment and the development of institutional investors have contributed significantly to the expansion of the debt market (public and private debt instruments), which accounted for 48 percent of M4 in December 2006. The stimulus from the securitization of different assets has also added to such expansion. Worth mentioning is the issue of securities backed on Sofoles' portfolios. Meanwhile, the relative importance of commercial banks as holders of public and private financial assets has continued to decline in favor of other financial intermediaries such as investment funds, Siefores and insurance companies.

Increased financial savings during recent years have been channeled mostly to the private sector, especially to households, where financing for consumption and housing have grown considerably. However, it is important to underline that, although financing to the private sector has grown, 62.5 percent of available resources are still used to finance borrowing requirements of the public sector, states and municipalities, as well as Banco de Mexico's accumulation of international assets (Table 2).[4] [5] Movements in the composition of the sources and uses of funds have significantly changed the risks associated with financial intermediation in Mexico. On the one hand, resilience to external shocks and exchange rate adjustments has increased, while on the other, although levels of indebtedness are still modest, households have become more exposed to credit risks.

3.3. Households

3.3.1. Households' financial savings

Residents' financial savings mostly consist of household savings (M2 households), among which pension (Siefores) and housing (Infonavit and Fovissste) funds associated with the SAR have been particularly dynamic (Graph 3). From January to December 2006, Siefores' assets rose at an average real annual rate of 17.5 percent in response to an annual flow of 132.8 billion pesos. Savings in Infonavit have also grown considerably (average annual rate of 8.8 percent in real terms during 2006), and amounted to 361.9 billion pesos in December 2006. As for voluntary savings, two types of financial intermediaries

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[3] In national accounts methodology an economy's saving is considered as a flow equal to gross fixed capital formation in construction, machinery, and equipment plus variations in inventories. The economy's financial savings refers to the stock of domestic financial assets. These resources are intermediated by the financial system and can be channeled to finance the private sector (consumption and investment expenditure), the public sector or the external sector (current account surplus).

[4] Banco de México issues monetary regulation bonds to sterilize the accumulation of international reserves and avoid expansion of monetary base.

[5] In this regard, domestic savings channeled to investment financing rose from 19.2 percent of GDP in 2003 to 21.8 percent in 2006.

stand out: commercial banks, traditionally the main recipient of household savings, and investment funds which have grown rapidly in recent years.[6]

Graph 3
Households' Financial Savings (M2)

a) Total Financial Savings by Intermediary	b) Voluntary and Compulsory Financial Savings[3]	c) Total Financial Savings
Percent of GDP	Percent of GDP	Real annual percentage change
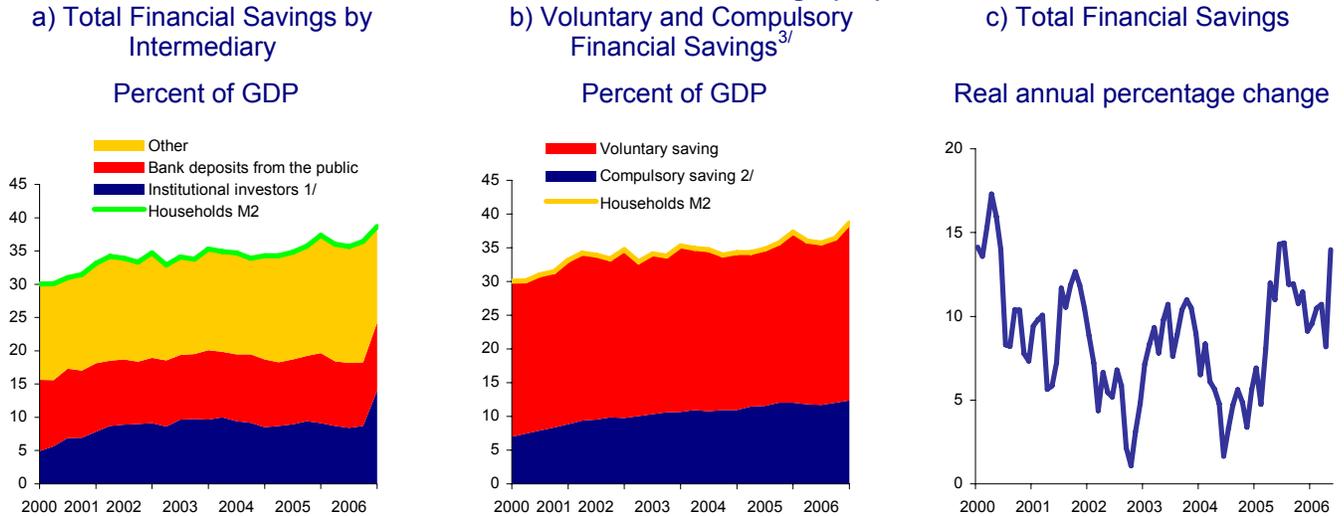
Figures at December 2006.
1/ Includes bills and coins held by the public, private investment in securities, housing funds (Infonavit and Fovissste), Banco de México's concentration account and retirement funds from the Government Employees' Social Security Institute (Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado, ISSSTE).
2/ Includes holdings of securities from Siefores, insurance companies and investment funds.
3/ See footnote on page 6.
Source: Banco de México.

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[6] Compulsory savings include resources from the Retirement Savings System (SAR), the Infonavit and pension funds from the Government Employees' Social Security Institute (ISSSTE). Voluntary savings are the difference between total financial savings and compulsory savings.

3.3.2. Household indebtedness

Restrictions on credit available to households have gradually decreased over the last few years. This sector previously had access to only a limited range of short-term high interest credit offerings. One indicator which shows the improvement in households' access to credit is the number of persons registered with the Credit Bureau as having some kind of loan. Such indicator rose from 13.9 million in December 2000 to 41.7 million in December 2006 (Graph 4a).[7]

As a result, during the last few years households' total debt portfolio has gained importance. At the end of 2006, the corresponding stock accounted for 14.6 percent of GDP, implying an increase of 4.8 percentage points of GDP between 2000 and 2006. The rise in credit granted to households responds to several factors among which the following are significant:

i)   A stable macroeconomy in a favorable external environment reflected in lower interest rates at different terms.[8]

ii)   Greater availability of domestic financial resources.

iii)   Households have been renewing consumer durables, stocks of which had significantly deteriorated after the 1995 crisis.

The recovery of consumer credit granted by commercial banks began in 2000 and by 2006 it represented 4.2 percent of GDP (Graph 4b). The dynamism of financing through credit cards is noteworthy, and even though credit card interest rates have fallen, they still remain at relatively high levels (Graph 4c). Thus, the financial system has become an alternative form of financing for households, which has allowed them to smooth their pattern of consumption throughout the latest economic cycle.

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[7]   Includes Credit Bureau files associated with commercial bank credit granted to individuals as well as retail, communication and service companies, non-bank automotive credit, mortgage credit from non-banks and other financial companies. It is important to mention that an individual can have more than one file. During the period studied in this report, the bureau included information provided by firms which were not previously at its disposition, while other companies stopped providing information. The net effect of the aforementioned on the number of files was low compared to the impact of new loans.

[8]   Interbank Equilibrium Interest Rate (Tasa de Interés Interbancaria de Equilibrio, TIIE) and Treasury Certificates (Cetes).

Graph 4
Consumer Credit

a) Number of Individuals Filed in the Credit Bureau
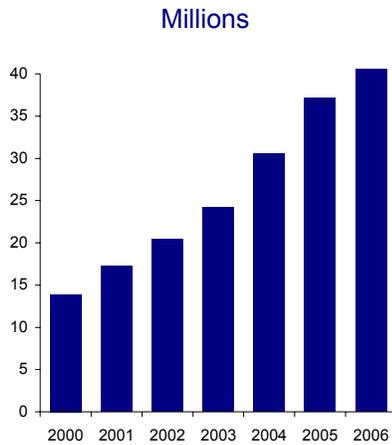
Millions

b) Consumer Credit [1]

Percent of GDP

c) Interest Rates

Annual percentage

Figures at December 2006.
Source: Credit Bureau.
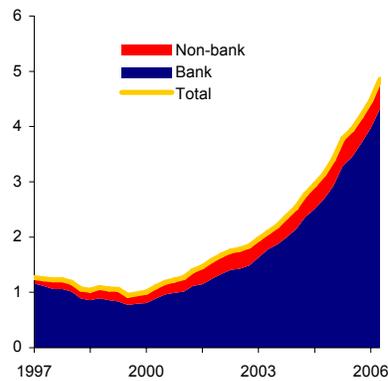
Figures at December 2006.
1/ Includes total consumption credit granted by commercial banks, development banks and Sofoles.
Source: Banco de México.
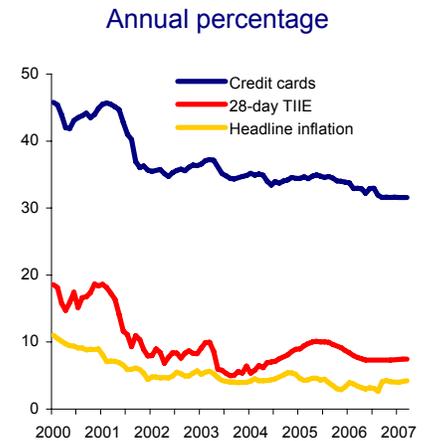
Figures at March 2007.
Source: Banco de México.

There are three types of financial intermediaries in the mortgage credit market: the Public Housing Institute (Instituto del Fondo Nacional de la Vivienda para los Trabajadores, Infonavit), 57 percent of the total mortgage portfolio at the end of 2006; commercial banks (29 percent); and Sofoles (14 percent). The total annual flow of mortgage financing in 2006 amounted to 120.1 billion pesos which represented real annual growth of 11.9 percent. Mortgage credit granted by commercial banks has grown significantly, partly due to banks' purchase of portfolio from Sofoles (Graph 5a).[9] Graph 5b shows the evolution of fixed mortgage interest rates granted by commercial banks as well as the so called Total Annual Cost (Costo Anual Total, CAT).[10]

3.3.3. Households' debt service

There are several indicators regarding the burden of households' debt service. One of the most commonly used consists of comparing debt payment with some measure of credit users' ability to pay, i.e. a variable linked to household income. Graph 5c illustrates households' debt service by type of credit and measured as a percentage of their available income.

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[9] Some banks have used Sofoles, which are part of their financial group, as vehicles to place mortgages and have later transferred such portfolio to their bank in order to leverage lower collection costs.

[10] See Box 17. In December 2004, the average CAT for fixed rate loans offered by commercial banks was 16.01 percent, while in December 2006 it was 13.46 percent.

From such information it is possible to draw the following conclusions:

i) The service of households' liabilities has grown at a faster pace than their income, meaning the relative financial burden has increased.

ii) Although mortgage credit represents a relatively higher burden for households, it is credit card debt which has increased more rapidly during the last few years.

It is important to point out that although households' debt service has risen, it is still at relatively low levels compared to other countries.[11]

Graph 5
Mortgage Credit and Households' Debt Service

a) Main Mortgage Creditors [1/]   b) Commercial Banks' Mortgage Rate [2/]   c) Debt Service as a Proportion of Households' Available Income [1/3/]
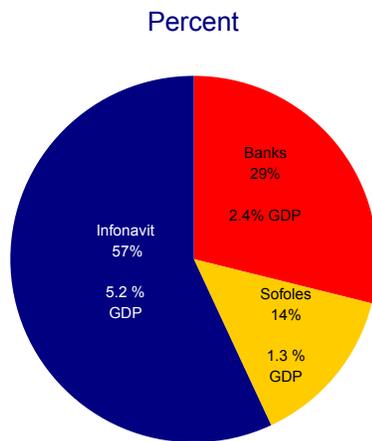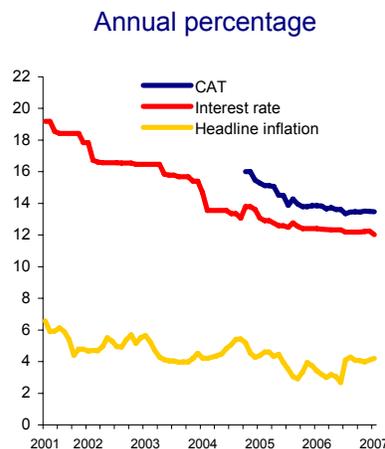
Percent   Annual percentage   Percent
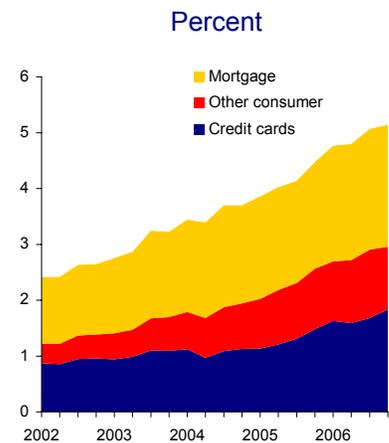
1/ Figures at December 2006.
2/ Figures at March 2007.
3/ Calculations of commercial bank credit card debt service are based on information regarding the minimum percentage charge and commissions for using credit cards. Service of other consumer credit was calculated using information on bank car loan terms, while service of mortgage credit took into account mortgages granted by commercial banks, Sofoles and Infonavit. For the first two of the aforementioned, credit terms were used, while for the last, the institute's credit amortization rules were followed. Calculations of available income are based on National Accounts System data for national available income, the wage bill of the National Employment Survey and IMSS, workers' remittances and the collection of individuals' taxes. Areas are stacked and the sum of the three different types of debt equals total service of the total debt.
Source: Banco de México.

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[11] Mexican households' total debt service rose from 2.4 percent of available income in the first quarter of 2002 to 5.1 percent in December 2006. In Chile, households' debt service represented 19 percent of their available income (2nd semester of 2006); in Spain it accounted for 15 percent (2nd semester of 2006), and in the U.S. it increased to 19.4 percent (4th quarter of 2006). Source: central banks of Chile, Spain and the U.S. Federal Reserve.

3.3.4. Households' non-performing loans

The vigorous expansion of loans granted by commercial banks to households during recent years has begun to be reflected in increased non-performing and performing loans with past due payments, particularly in those corresponding to consumer credit.[12] Thus, the delinquency rate for consumer credit portfolio rose from 3 percent in December 2005 to 4.3 in December 2006. Tjhis behavior contrasts with that of the delinquency rate of bank mortgage credit which continued to decline. In 2006, the probability of default (Box 10) for consumer credit increased, while for mortgage credit it remained practically unchanged (Graph 6a and b).[13] The rise in the delinquency rate for consumer credit is mainly associated with credit cards and is the result of some banks' strategy of granting credit to riskier sectors and to individuals who, in some cases, had no credit history. [14]

Graph 6
Delinquency Rate, Probability of Default,[1/]
and Households' Net Financial Position [2/]

a) Consumer Credit	b) Mortgage Credit	c) Households' Net Financial Position
Percent	Percent	Percent of GDP
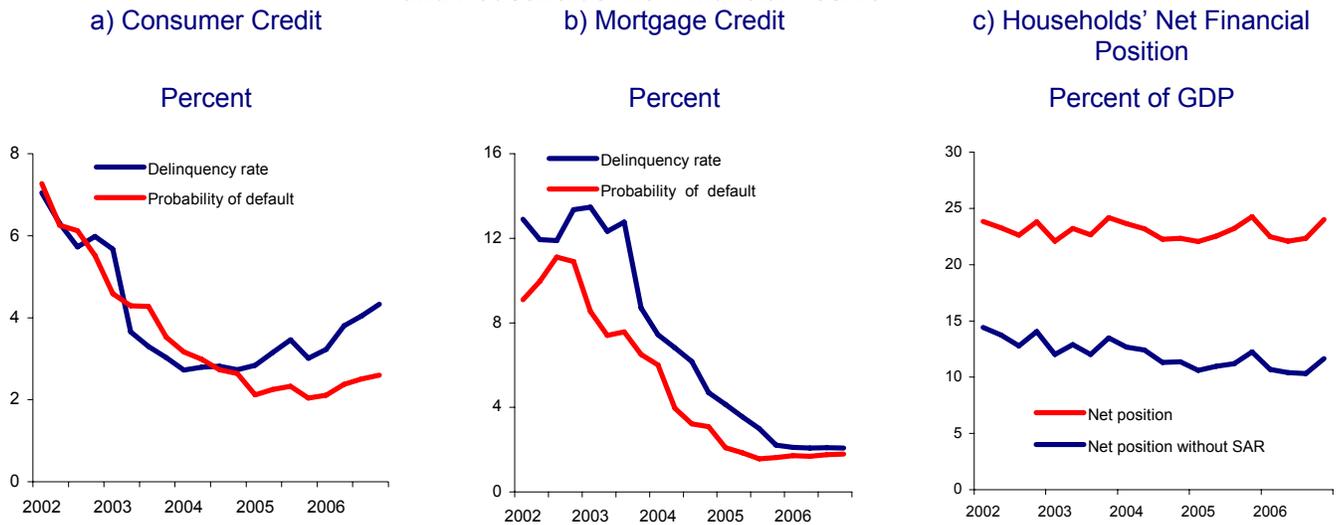
Figures at December 2006.
1/ See footnote on page 13.
2/ Assets minus liabilities, excluding holdings of stocks and shares.
Source: Banco de México.

3.3.5. Households' financial position

At the end of 2006, households' financial savings equaled 38.7 percent of GDP, one third of such figure deriving from SAR. Households' indebtedness has risen considerably during recent years. In December 2006, the balance of mortgage and consumption credit represented 9.3 and 4.8 percent of GDP,

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[12] Performing loan portfolios with past due interest payments are not considered as overdue loans in accounting principles.

[13] Creditors' probability of default on contractual obligations from the six largest banks. The indicator's value goes from one to one hundred percent, zero indicates default is impossible, and one hundred percent that default is ensured. Such probabilities are estimated from each type of loan's default rate defined as the ratio of debtors or loans which cease payment for a given period to those who were up to date with payments during the preceding period.

[14] During 2006, commercial banks issued 8.7 million additional credit cards, 40 percent of which were given to individuals with no credit history.

respectively.[15] As a result, households maintained a creditor position equal to 24 percent of GDP. Nevertheless, excluding compulsory saving in pensions and housing from such calculations, a less slack position amounting to 11.6 percent of GDP is revealed (Graph 6c).[16]

3.4. Private firms

3.4.1. The structure of private firms' financial liabilities

According to the 2004 Economic Census, there are around 3 million firms in Mexico, most of which are small and medium-sized enterprises operating in the services sector. The number of companies with access to financing has increased during the last few years, and the number of firms registered in the Credit Bureau as having some kind of debt has risen from 613 thousand in December 2000 to almost 1.6 million in December 2006 (Graph 7a).[17] [18]

A more stable macroeconomic environment and the development of the debt market, among other factors, have contributed to increase the availability of resources for firms at better terms and conditions. Under this environment firms have been able to:

i)   Substitute external liabilities for domestic ones. As a consequence, firms' external financing declined from 9.5 percent of GDP at the end of 2000 to 6.9 percent in December 2006 (Graph 7c).

ii)   Extend their debt maturities. From December 2001 to December 2006, the average maturity of corporate securities rose from of 1,015 to 1,827 days (Graph 8c).

The above results have meant firms are less vulnerable to different types of adverse shocks. Companies have found alternative sources of financing in their own resources and in credit granted by suppliers.[19] One trend observed over the last few years has been a significant decline in the share of commercial banks in total financing to firms (Graph 7b). The greater availability of alternative sources of financing for firms, including the placement of securities and external loans, has meant commercial banks have been able to increase their credit supply to households.

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[15] In 2006, sources of non-bank consumer credit represented 0.6 percent of GDP.
[16] It is important to mention that such figure only includes households' financial assets, which are just a proportion of their total wealth.
[17] A firm can have more than one file and this indicator does not include individuals with business activity.
[18] Economic census includes information on establishments in the industrial and service sectors and excludes primary activities (except fishing and fisheries). The bureau on the other hand, reports information on firms from all economic sectors.
[19] Information published by INEGI indicates that, in 1994, investment financed by non-financial private companies through their own resources accounted for 20.3 percent of total investment, while in 2003 it represented 69 percent. According to Banco de México's Evaluation of Credit Market Conditions Survey, during October-December 2006, 83.5 percent of companies surveyed responded that they had been granted some type of financing.

Graph 7
Financing to Private Firms

a) Number of Firms in the Credit Bureau
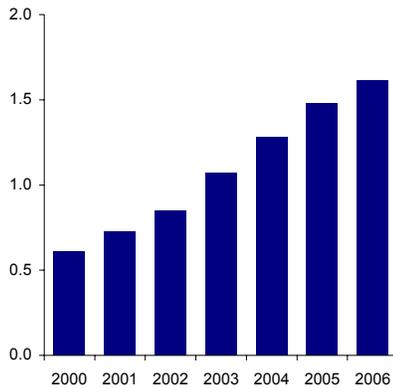
b) Total Financing to Firms

c) Total Financing to Firms

Millions

Percent of GDP

Percent of GDP
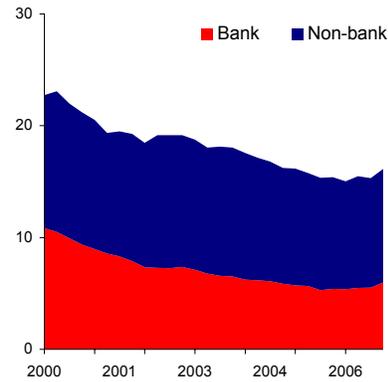
Figures at December 2006.
Source: Credit Bureau.

Figures at December 2006.
Source: Banco de México.
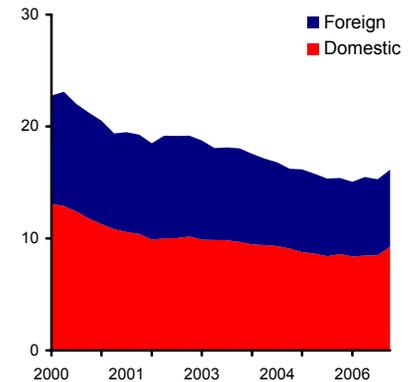
3.4.2.   Private firms' domestic debt market

The domestic debt market has become gained importance as an alternative source of domestic currency long-term financing for firms (Graph 8a). The stock of medium-term corporate debt increased from 0.8 percent of GDP in December 2001 to 1.6 percent at the end of 2006 (Graph 8b). Furthermore, during the same period, the total number of companies which issue this type of securities rose from 91 to 98. Under such context, the rise of stock certificates and the recent increase in terms to maturity or residual maturity of corporate debt is outstanding (Graph 8c). Regarding the extension of corporate debt maturities, only 36 percent of the total amount has a residual maturity of less than one year, while 40 percent has a residual maturity of more than three years. As will be explained later, such increase has led to a reduction in the frequency with which Mexican companies refinance their debt and, consequently, in their liquidity risks.

Graph 8
Non-financial Firms' Debt

a) Long-Term Debt Yield and Issuance

b) Short and Medium-Term Debt [1/]

c) Debt's Residual Maturity

Annual percentage yield (right scale)

Billion (left scale)

Percent of GDP

Days (weighted average)
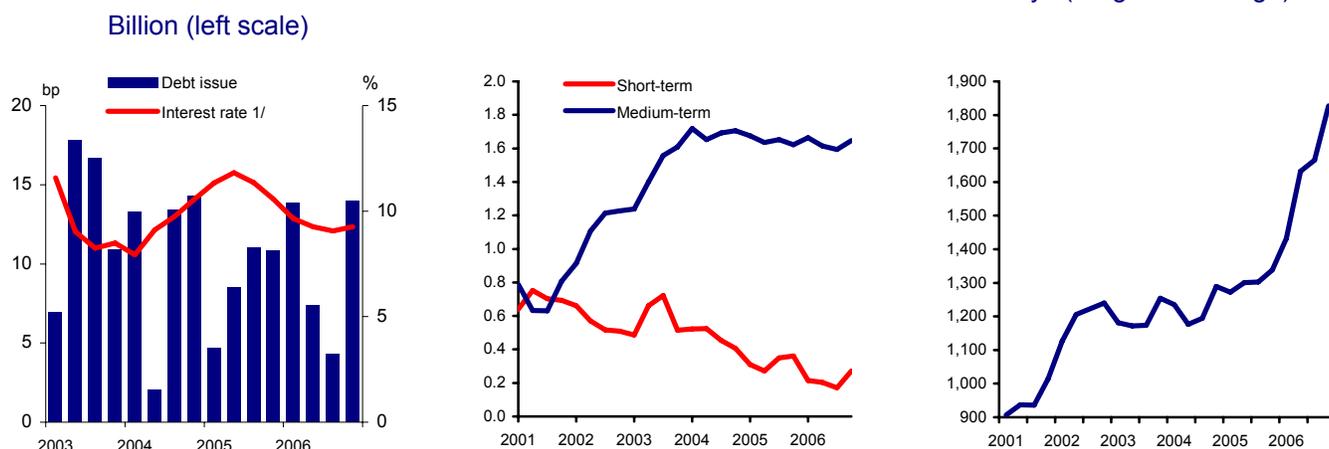
Figures at December 2006.
1/ Corporate debt placed at maturities of less than one year is defined as short-term and that placed at one year or more is defined as medium-term.
Source: Banco de México.

3.4.3.   Bank credit to private firms

Since the crisis of 1994, the importance of commercial bank credit in total firms' financing has declined relatively. Nevertheless, such variable has recovered in recent months. The behavior of commercial banks' direct performing credit to firms has differed among sectors: i) most credit is granted to the services sector which, at the end of 2006, accounted for 55.3 percent of total credit to firms, figure higher than that observed in December 2000 (51.8 percent); ii) credit to the manufacturing industry has declined as a percentage of total credit to firms, from 37.7 percent in December 2000 to 26.5 percent in December 2006; and iii) credit to the construction sector increased from 5.1 to 9.8 percent of total credit granted to firms (Graph 9a). As for company size, recently there has been significant growth in credit to small and medium sized firms, while financing to large enterprises has also grown, if less vigorously (Graph 9b).[20] Graph 9c shows lending interest rates applicable to firms. According to Banco de México's Evaluation of Credit Market Conditions Survey, during the fourth quarter of 2006 the main reasons why companies did not take commercial bank credit were high interest rates and having their applications turned down by banks.

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[20] According to the Ministry of Economy, a company is considered small and medium sized (Pequeñas y medianas empresas, Pyme) when it has less than 100 employees and belongs to either the retail or services sector, or has less than 250 employees if it is in the industrial sector. The growth of financing to Pymes in recent years has been encouraged by commercial and development bank programs specifically focused on such firms. Some of the aforementioned programs have benefited from Federal Government support, such as those instrumented through the development bank institution Nacional Financiera (Nafinsa).

Graph 9
Commercial Bank Credit to Private Firms

a) Performing Loans by Economic Activity	b) Bank Credit to Firms by Size of Firm	c) Average Lending Interest Rates
Real annual percentage change	Real annual percentage change	Annual percentage
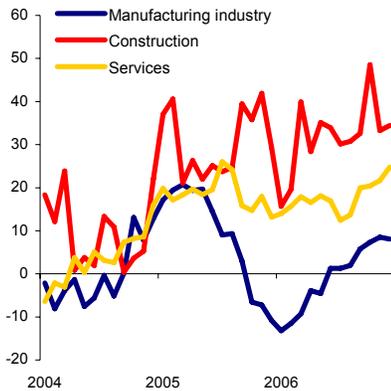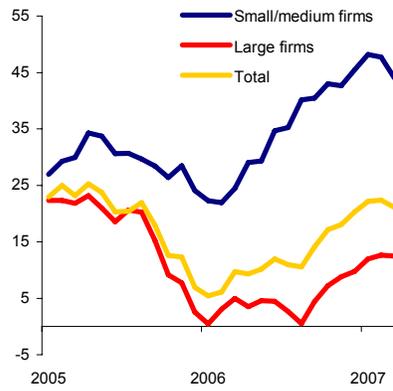
Figures at December 2006.
Source: Banco de México.

Figures at March 2007.
Source: Banco de México.
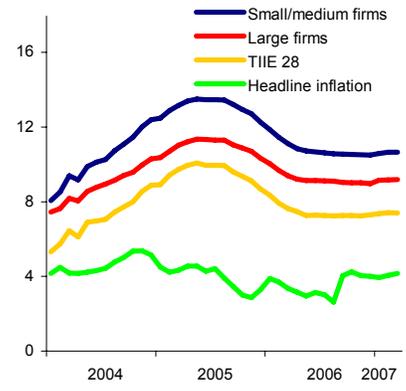
Figures at March 2007.
Source: Banco de México.

3.4.4. Evolution of private firms' non-performing loan portfolio

The delinquency rate of commercial banks credit to firms has continued to decline, from 7.5 percent in 2002 to around 0.9 percent in December 2006. The likelihood of companies defaulting on credit payment obligations has also substantially decreased (Graph 10a).

3.4.5. Private firms' debt service

Greater macroeconomic stability has allowed firms to substantially improve their debt profiles and this has been reflected in a reduction of companies' debt service measured as a percentage of such liabilities (Graph 10b). The most significant reduction was observed in the service of liabilities associated with the placement of securities, which decreased from 95.2 percent of total debt at the start of 2002 to 31.7 percent in December 2006 (Graph 10).

Graph 10
Private Firms' Delinquency Rate, Probability of Default, and Debt Service

a) Credit to Firms	b) Firms' Domestic Debt Service as a Proportion of its Total Debt[1]	c) Firms' Service of Securities Debt as a Proportion of Total Debt [1]
Percent	Percent	Percent
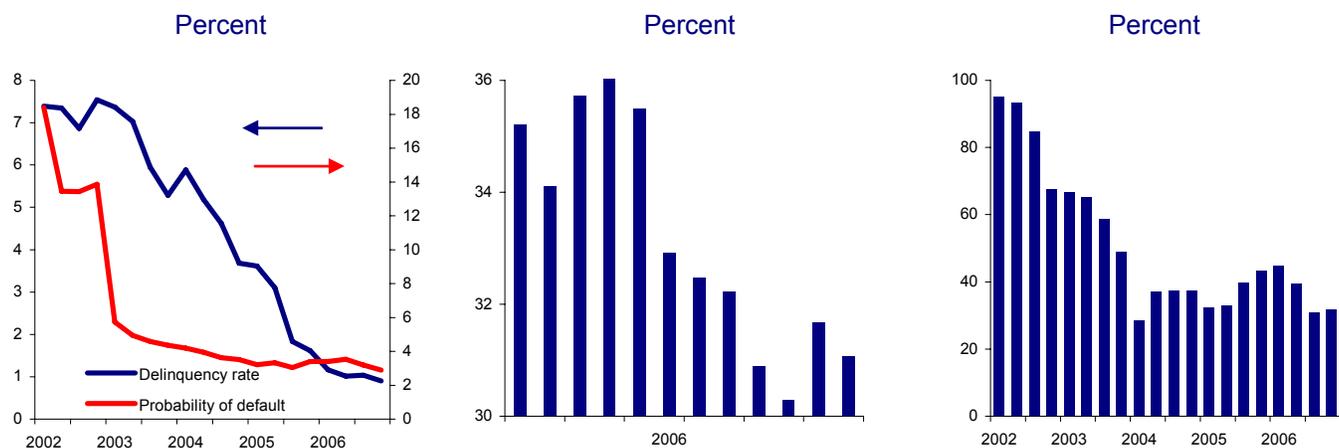
Figures at December 2006.

1/ Debt service takes into account both amortizations and interest payments. Bank credit amortizations are calculated from commercial loans with maturities or residual maturities of up to three months. Interest corresponds to financial revenues accrued by commercial credit. Corporate debt amortizations are maturities accumulated during the quarter, while interest corresponds to the instrument's average weighted rate.

Source: Banco de México.

3.5. Public sector

3.5.1. Public sector borrowing requirements

The availability of resources for the public sector has risen considerably during recent years due to increased revenues (both oil and non-oil) and a reduction in the financial cost of public debt (Graph 12b and c). Thus, a comparison of figures for the periods 2001-2006 and 1997-2000 reveals that, on average, public sector has had access to additional revenues amounting to 2.39 percentage points of GDP each year. Such result can mainly be explained by three factors: increased oil revenues equal to 1.06 percent of GDP, a rise in non-oil revenues for an equivalent of 0.52 percent of GDP and reduced financial cost amounting to 0.81 percent of GDP (Graph 11). The greater availability of resources has enabled the expansion of public expenditure and, at the same time, the improvement of the fiscal balance, measured both traditionally (economic balance) and broadly (Public Sector Borrowing Requirement, PSBR) (Graph 12). The process described above has freed resources for financing the private sector (Table 1).

Graph 11
Public Revenues, Expenditure and Balance [1]

Difference on the annual average value, 2001-2006 and 1997-2000

Percent of GDP
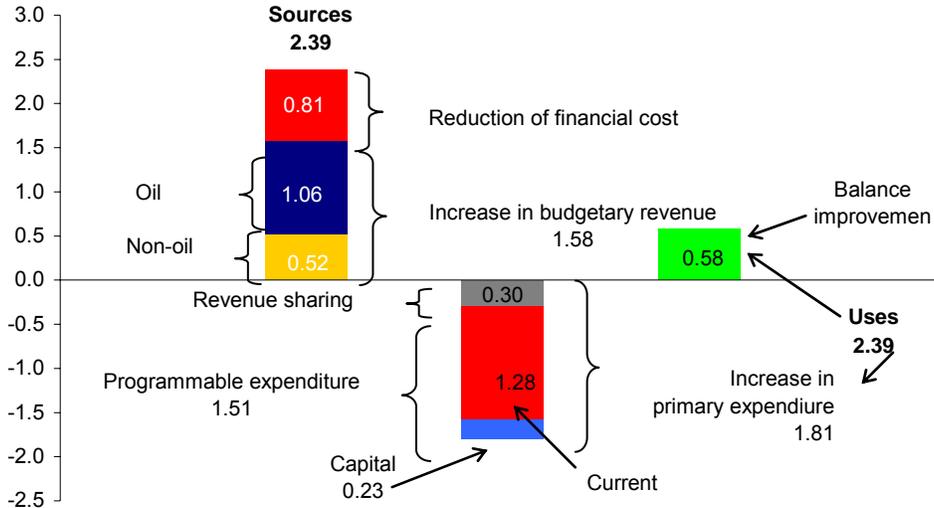
Annual figures at 2006.
1/ Figures may not add up due to rounding.
2/ Reduction of the financial cost includes a decrease in payments of accrued expenditures from the previous year (*Adeudos de Ejercicios Fiscales Anteriores*, ADEFAS) and an improvement in the non-budgetary balance of 0.01 percent and 0.03 percent of GDP, respectively.
Source: Ministry of Finance (SHCP).

Graph 12
Fiscal Indicators

a) Economic Balance and Public Sector Borrowing Requirements (PSBR)[1]
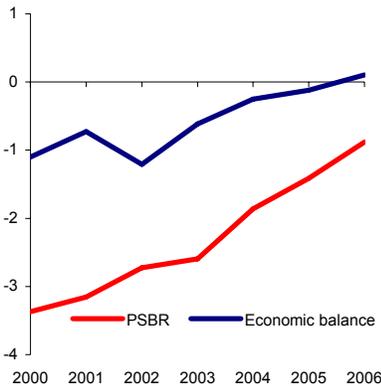
b) Oil, VAT and Income Tax Revenues
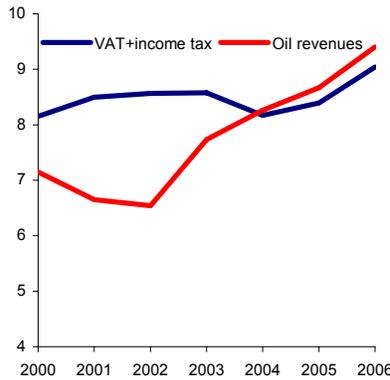
c) Financial Cost of Public Debt and Inflation [2]

Percent of GDP

Percent of GDP

Percent of GDP and Percent
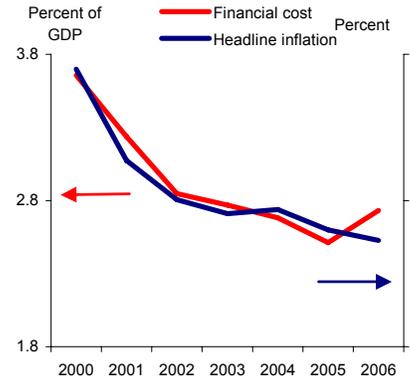
Figures at December 2006.
1/ PSBR do not include the effect of the interchange of Fobaproa (former deposit insurance scheme) promissory notes.
2/ Public debt's financial cost (federal government and public enterprises and entities) consists of interest, commissions and public debt expenses, as well as hedging costs. Debt amortizations are not included in this item.
Source: Ministry of Finance (SHCP) and Banco de México.

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3.5.2.   The structure of public debt

Public sector borrowing requirements (PSBR) have declined over the last few years. However, public debt still accounts for a significant percentage of the economy's total financial liabilities. At the end of 2006, the balance of the net broad economic debt measured as a proportion of GDP was 18 percent or 33.4 percent of GDP, if additional liabilities are included (Graph 13a).[21]

Graph 13
**Public Debt**

a) Net Broad Economic Debt[1/]   b) Net Debt Consolidated with Banco de México[3/]   c) Federal Government Securities by Term to Maturity[4/]
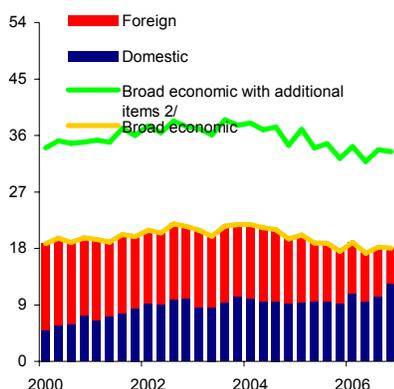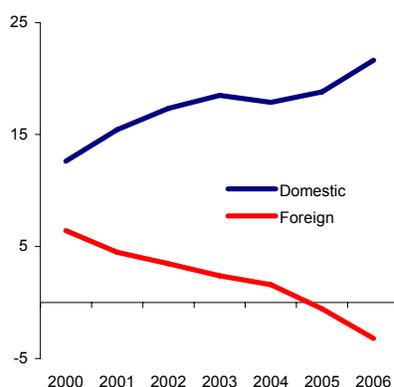
Percent of GDP   Percent of GDP   Percent
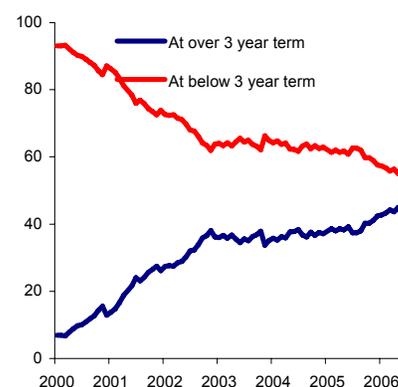
Figures at December 2006.
1/ The net broad economic debt includes liabilities of the federal government, public enterprises and official financial intermediaries (development banks and trust funds).
2/ Additional items include liabilities from FARAC (toll roads rescue program), IPAB, PIDIREGAS and debtor support programs.
3/ The net public sector debt consolidated with Banco de México includes central bank's financial assets and liabilities with the private sector, commercial banks and the external sector. It does not include additional items.
 4/ Residual term or term to maturity.
Source: Banco de México.

The composition of public debt reveals three trends which have contributed to a reduction in such sector's vulnerability to exchange and interest rate movements: i) the policy of substituting external liabilities for domestic ones. The broad domestic debt measured as a proportion of total public sector liabilities rose from 38 percent in December 2000 to 68.9 percent at the end of 2006 (Graph 13a). From the third quarter of 2005 the public sector consolidated with Banco de México has also maintained a net creditor position with the exterior (Graph 13b);[22] ii) a significant change in debt composition, from indexed and variable interest rate securities to fixed rate bonds (Graph 16b);[23] and ii) the longer average maturity of federal government debt (Graph 14a).

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[21] The broad net economic debt includes net liabilities of the federal government, public enterprises, development banks and trust funds. Additional items correspond to liabilities from FARAC, IPAB, Pidiriegas and debtor support programs.

[22] The public sector consolidated with Banco de México includes central bank's financial assets and liabilities with the private sector, commercial banks and the external sector, but excludes debt from Pidiriegas, FARAC, IPAB and debtor support programs.

[23] At the end of 2006, fixed rate debt represented 67.2 percent of the total domestic debt, while in December 2000 it accounted for only 35.7 percent. The change in debt structure towards long-term fixed rate bonds has also led to a significant increase in their average maturity.

**Graph 14**
Public Debt Service

a) Average Weighted Term	b) Refinancing Requirements of Domestic Federal Government Securities	c) Interest Payments on Federal Government Debt as a Proportion of its Revenues
Number of days	Number of times	Percent
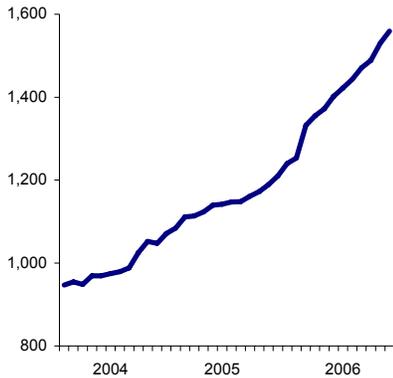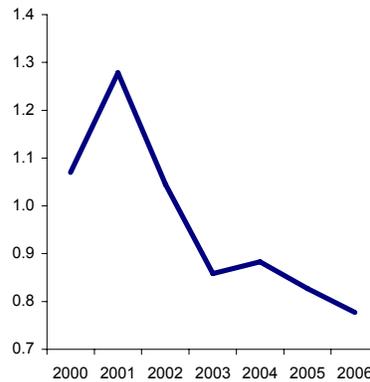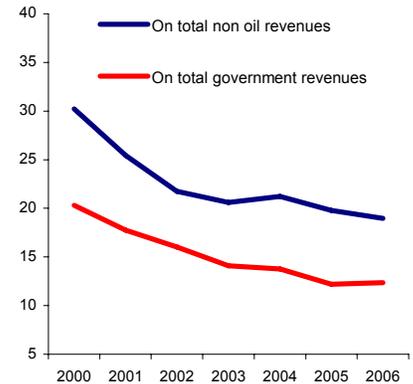
Monthly figures at December 2006.
Source: Banco de México.

As part of the process to replace external liabilities for domestic debt, the federal government has purchased international reserves from Banco de México in order to prepay foreign debt.[24] In accordance with such policy, in July 2005, the federal government used its own resources to purchase 2.9 billion US dollars.[25] Likewise, in August 2006, the federal government made an additional purchase for 12.5 billion US dollars, which was financed through the issue of securities (Box 3).

3.5.3. Federal Government debt service

The change in the structure of federal government liabilities has, among other benefits, reduced the frequency with which public debt needs to be refinanced and also led to lower liquidity risk. In particular, annual maturities of federal government's domestic debt moved from being around 1.1 times the stock of government securities at the end of 2000 to slightly under 0.8 times in 2006 (Graph 14b). Furthermore, the public sector has managed to reduce interest payments on its debt measured as a percentage of its total revenues (Graph 14c). Such result mainly stemmed from the increase in the average maturity of domestic debt as well as the decline of interest rates during the last decade.

3.5.4. States and municipalities' debt

At the end of 2006, the stock of states and municipalities' debt was 160.1 billion pesos, a variation of 5.9 percent in real terms compared with its level at the end of 2005. Most of these liabilities correspond to federal entities (Graph 15a). Nevertheless, although the total debt of states and municipalities is relatively

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[24] See Quarterly Inflation Reports July-September 2005 and July-September 2006.
[25] This operation was carried out in order to make 4.8 billion US dollars available to cover currency-denominated securities maturing in 2006 and 2007 as well as for the early redemption of sovereign bonds placed in international markets.

low when measured as a percentage of GDP (1.8 percent in 2006), such liabilities represented roughly half the federal revenues they received during the last six years (Graph 15b). In this regard, it is important to mention that revenues channeled by the federal government to states and municipalities have increased considerably in recent years, mainly as a consequence of the significant rise in public revenues stemming from very high international oil prices.

Graph 15
States and Municipalities' Debt

a) Debt Structure of States and Munucipalities[1]

Percent
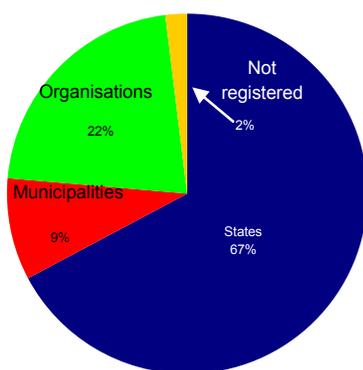
b) States' Debt as a Proportion of their Revenues

Percent
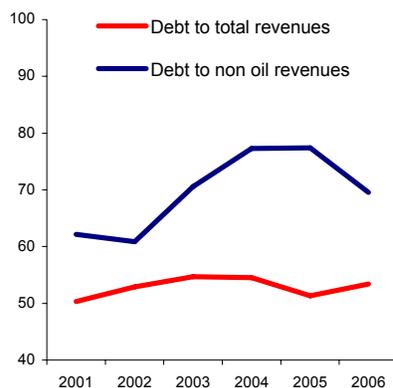
c) Average Weighted Maturity of States' Debt in Securities

Years
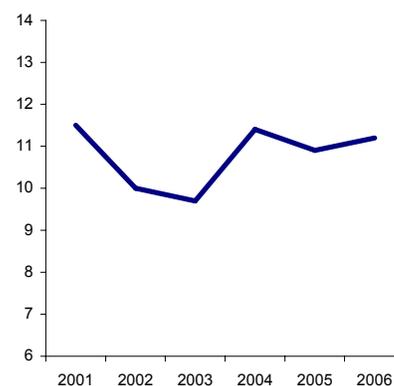
Annual figures at 2006.
1/ Liabilities of state and municipality entities.
Source: Ministry of Finance (SHCP).

There is a significant difference between the level of indebtedness of federal and municipal entities, measured both in terms of their relative participation and as fraction of the federal revenues they receive. The ten most indebted states account for 82.7 percent of state and municipal governments' total debt. On the other hand, thelevel of indebtedness of the ten entities with the highest debt-to-revenue ratio accounted for 81.5 percent of total revenues received by such entities, the national average, being around 50 percent. Finally, one difference between the liabilities of states and municipalities and of Mexico City is that the former are not expressly guaranteed by the federal government, which is the reason why commercial banks have to create capital reserves according to the results of evaluations made by at least two rating agencies.

4. Financial Markets

This section focuses on recent developments in Mexico's main financial markets. In the case of the debt market, a summary of the most important issuers and investors' activities as well as the operation of the secondary market is given. Meanwhile, for the foreign currency market there is a description of the behavior of operation volumes, after which an account of activity in the derivatives market is presented.

4.1. Debt market

4.1.1. Main issuers

The most important issuers in Mexico's debt market are the federal government, IPAB, and Banco de México. Other significant issuers include public and private companies as well as various federal entities and municipalities.

Federal Government

The federal government is the main issuer of securities in the market. The policy of substituting foreign domestic liabilities for domestic ones has helped increase the resilience of the public finances to external shocks, while simultaneously fostering the development of the domestic debt market (Graph 16a).

Graph 16
Federal Government Debt

| a) Securities Issued Abroad as a Proportion of Total Debt in Securities	b) Domestic Debt by Type of Security	c) Adjusted Duration [1]
Percent	Percent of GDP	Days
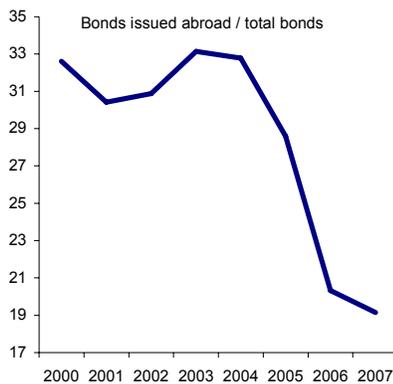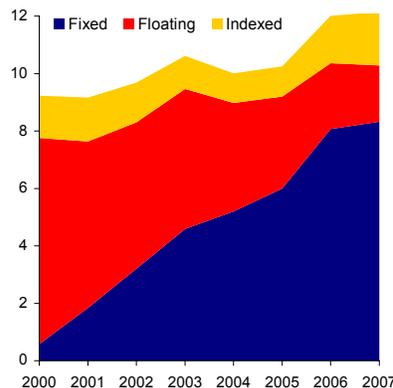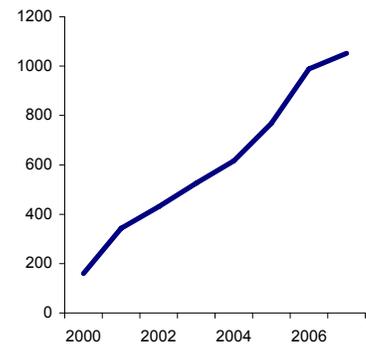
Figures at March 2007.
1/ The Adjusted Duration is the duration divided by one plus the interest rate yield. It measures the percentage change in debt's market value following a variation in its interest rate yield.
Source: Ministry of Finance (SHCP) and Banco de México.

The federal government also improved the profile of its peso-denominated debt by prioritizing the placement of long-term securities at fixed

rates (Graph 16b). Throughout 2006, the government managed to raise maturities on its debt to 20 and 30 years at real interest rates and successfully carried out the first placement of 30-year securities at nominal interest rates. As a result, a reference has been created for the issuance of other long-term liabilities. The swapping of bonds which began in 2005 continued with the aim of smoothing maturities on government liabilities (Box 1).

Box 1

Bond Swapping

In September 2005 the Ministry of Finance (SHCP) began swapping bonds in order to smooth the maturity curve of its securities. Each swap exchanges bonds close to maturity for bonds with longer terms to maturity[1]. Such procedure has halted the concentration of very high values at similar maturities, without sacrificing the liquidity and depth obtained by maintaining large amounts in circulation for most of the bonds' life.

- Interested parties presented their offers for Target Issuance and chose the Settlement Issue they wished to receive in exchange.
- At the end of the auction, Target Issuance prices were placed in order, from lowest to highest, and the issue was offered until it was all sold and/or it reached the maximum price the federal government was willing to pay.

Amounts swapped in 2006.
Variation of amounts outstanding
Billion pesos
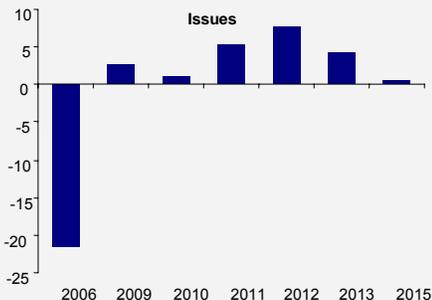
Source: Banco de México

Amounts swapped in 2007.
Variation of amounts outstanding
Billion pesos
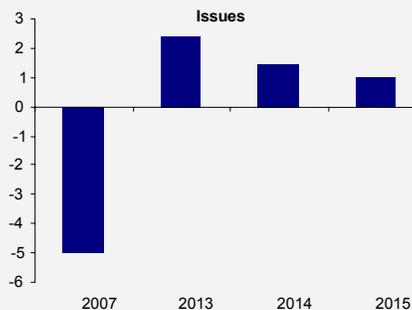
Source: Banco de México

Each swap was carried out according to the following procedure:

- The federal government determined how much of the short-term bond it would purchase (Target Issuance) and the long-term bonds it wanted to swap for them (Redemption Issuance).
- Prices of Redemption Issuances were published at the moment auctions opened.

During 2007, the federal government continued its swaps program according to the above procedures. From September 2005 to May 2007, nine swaps were made for a total of 30.5 billion pesos.

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[1] See "Regulations for swapping fixed rate federal government development bonds" in Banco de México's Circular 2/2005

The reduction of external debt via the placement of instruments known as warrants (Box 2) and the payment of external liabilities through a joint operation with Banco de México (Box 3) were noteworthy. Such operations enabled the federal government to substitute almost 12 billion U.S. dollars worth of external debt for domestic peso-denominated liabilities.

Box 2

Debt Exchange Warrant Offering

In November 2005, the Ministry of Finance announced a program to substitute foreign debt for domestic debt via the sale of warrants (options). Such program was implemented to complete its debt management strategy.

The warrant holder has the right, but not the obligation, to exchange federal government bonds denominated in foreign currency (UMS) for fixed rate peso bonds (MBonos). For the option to be exercised, the yield spread between debt in pesos and that in foreign currency had to decrease. For investors the appeal of this "insurance" was precisely the fact that they would sell UMS and purchase fixed rate peso Bonds under favorable conditions to them. Meanwhile, the Ministry of Finance would carry out large transactions without adversely affecting the Bond market.

As shown below, during the period between the warrants issuance and exercise dates, interest rate spreads between pesos and US dollars fell considerably.

M and UMS bond spreads
Basis points

	Warrant Issuance Date	Warrant Exercise Date
Bond dec-11 UMS 2011	323	256
Bond dec-14 UMS 2014	318	290
Bond dec-24 UMB 2026	279	216

UMS and Bond yield curves
Billion pesos

Source: Banco de Mexico

Exercise date	UMS offered	MBonos received
09-Nov-2006 XW5	UMS 2007 UMS 2008 UMS 2009 UMS 2010 UMS 2011	Bond 2011
10-Oct-2006 XW10	UMS 2012 UMS 2013 UMS 2014 UMS 2016	Bond 2014
01-Sep-2006 XW20	UMS 2019 UMS 2022 UMS 2026 UMS 2031 UMS 2033	Bond 2024
22-Nov-2006 XWE	ITL 2007, 2013, 2017 DEM 2008, 2009 EUR 2008, 2010, 2013	Bond 2013 2023
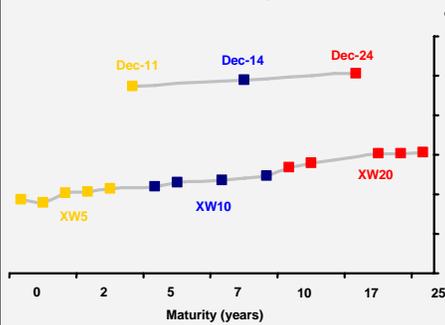
All warrants were exercised, resulting in the following peso denominated Bond offers:

Exercise date	Bond series	Million pesos
9 Nov. 2006	Bond 2011	10,267.97
10 Oct. 2006	Bond 2014	10,309.49
7 Sep. 2006	Bond 2024	4,954.20

In March 2007, the federal government issued a new series of debt exchange warrants with the following characteristics:

Warrant	UMS Eligible to Exchange	MBonos Eligible to be Received	Series	Exercise date
XWD	UMS 2009 UMS 2010 UMS 2011 UMS 2012 UMS 2013 UMS 2014 UMS 2015 UMS 2016 UMS 2019 UMS 2022 UMS 2031 UMS 2033	Bond 2014 or Bond 2024	A	11 October 2007
			B	7 November 2007
XWE	EUR 2008 DEM 2008 DEM 2009 EUR 2010 EUR 2013 ITL 2013 EUR 2015 ITL 2017 EUR 2020	Bond 2014 or Bond 2024		19 September 2007

The amount issued for XWD bonds was 2 billion US dollars and for XWE bonds 500 million euros.

Institute for the Protection of Bank Savings (IPAB)

IPAB maintained its policy of issuing flexible interest rate bonds, leveraging the federal government's change of strategy in favor of fixed rate liability placements (Graph 17a). Regarding non-marketable debt, IPAB paid its total obligations associated with the so called New Program as well as a large amount of performing promissory notes (Table 3).

Table 3
Structure of IPAB liabilities
Million pesos

	2004	2007[1/]
Tradeable Securities	382,500	618,650
Bpas	198,100	192,900
Bpat	174,000	345,000
Bpa182	10,400	80,750
Non-tradeable securities	406,100	123,500
New Program[2/]	168,300	0
IPAB Promissory Note	104,500	2,800
IPAB Credit	133,300	120,700
Total	788,600	742,150

1/ Figures at March 2007 (rounded figures).
2/ The New Program consists of substituting FOBAPROA's Purchase Program and Portfolio Capitalization (PCCC Promissory Note).
Source: IPAB.

Banco de México

In August 2006, Banco de México withdrew from circulation Brems (Monetary Regulation Notes) amounting to 135 billion pesos using funds derived from the sale of international reserves to the federal government (Box 3).

Box 3
Brems auction purchase and sale of Bondes D

In August 2006, the Ministry of Finance (SHCP) announced its decision to prepay its debt with the World Bank and the Inter-American Development Bank (BID). Such debt had been issued at less favorable terms than the cost of financing available to the government in that moment. The resources for such operation came from the federal government's issue of Bondes D for a total of 135 billion pesos. In a simultaneous operation, Banco de México withdrew an equal amount of Brems. Bondes D have the same characteristics as Brems and are used by Banco de México for monetary regulation purposes. Thus, although the total level of federal government debt remained constant, the cancellation of external debt reduced its vulnerability to exchange rate fluctuations. The decrease in the stock of international reserves in Banco de México implied a lower net cost for the central bank given the parallel decline in its peso denominated liabilities, which pay higher interest rates than those received by US dollar investments.
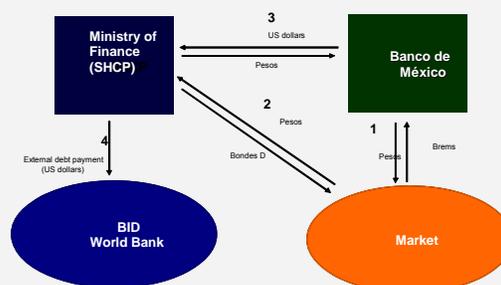

This operation was well received by the market, enabling the initial amount to increase from 7 to 12.5 billion US dollars. The funds were used to repay liabilities with the World Bank and BID for 9 billion US dollars, as well as debt repurchase.

As a result of the operation described above, the stock of Brems in circulation at the end of March 2007 was around 101 billion pesos, a figure equivalent to 1.1 percent of GDP (Graph 17b). Starting in August 2006, Banco de México ceased to issue such securities in its liquidity management operations, substituting them for Bondes D (federal government bonds with similar features as Brems) .[26]

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[26] Bondes D are federal government liabilities. For this reason, Banco de México reimburses their financial cost to the government. Banco de México also uses Monetary Regulation Deposits to neutralize excess liquidity in the financial system. As of December 2006, the stock of Monetary Regulation Deposits was 279 billion pesos.

Graph 17
Securities Market Debt of Banco de México, IPAB and FARAC

a) IPAB (BPA's)   b) Banco de México (Brems)   c) FARAC (PICS and CBICS)

Percent of GDP   Percent of GDP   Percent of GDP
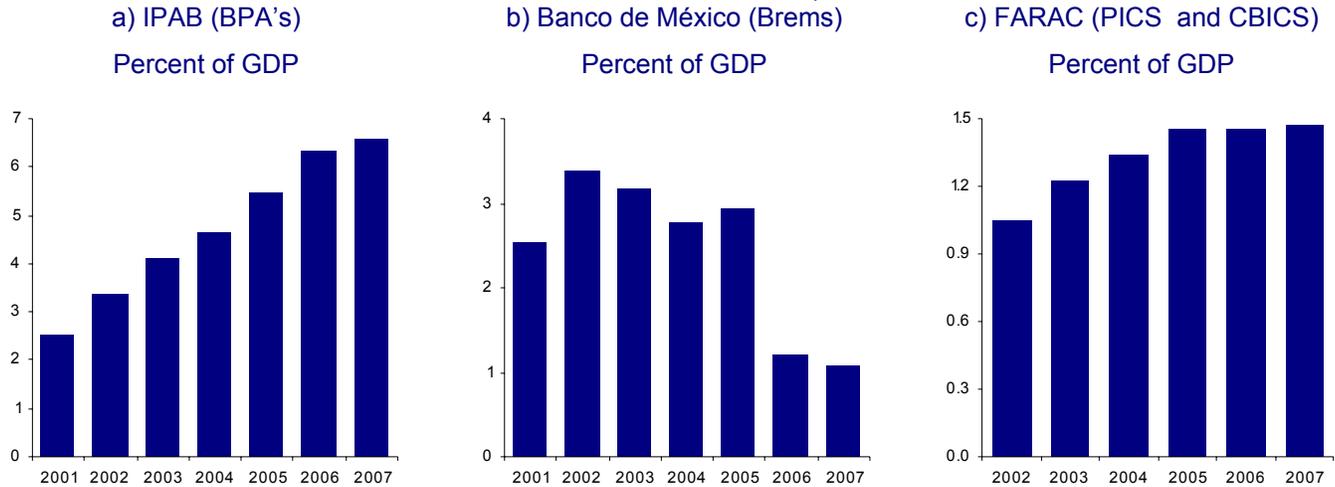
Figures at March 2007.
Source: Banco de México.

Toll Road Rescue Program (Fideicomiso de Apoyo para el Rescate de Autopistas Concesionadas, FARAC)

FARAC announced the suspension of Road Indemnity Stock Certificates Strips (Certificados Bursátiles de Indemnización Carretera Segregables, CBICS) as of 2006. CBICS, securities issued at maturities of 20 and 30 years, were used to substitute Road Indemnity Promissory Notes (Pagarés de Indemnización Carretera, PICs) in 2002 (Graph 17c). [27]

Other issuers

During 2006 and the first quarter of 2007, securities of private and public firms, Sofoles, and public entities (other issuers) were mostly issued at variable interest rates (Graph 18c). At the end of March this year, the total stock of certificate debt of these public and private issuers amounted to 362 billion pesos, a figure 29 percent higher than that recorded at the end of 2005. The federal government's issue of 30 year bonds enabled private issuers and decentralized institutions to place securities for 17 billion pesos at maturities of over 25 years during the last quarter of 2006 and the first quarter of 2007.

Notwithstanding the above, access to the market continued to be restricted to a small number of entities with high credit ratings.[28]

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[27] PICs were created in 1998 in order to meet road debt commitments, operation, preservation, and maintenance.

[28] As of March 2007, 68 percent of peso denominated securitized debt from firms, states, municipalities, and decentralized institutions was AAA rated (on Standard and Poors, Fitch, and Moody's scales), the highest grade given by the main rating agencies to securities in local currency, while 26 percent had an AA rating and a very small percentage was rated below the BBB- investment grade floor.

Graph 18
Securitized Debt of Private Firms, State Enterprises, Sofoles, States and Municipalities

a) Stock Market Securities | b) By Type of Issuer | c) By Type of Security

Percent of GDP | Percent | Percent
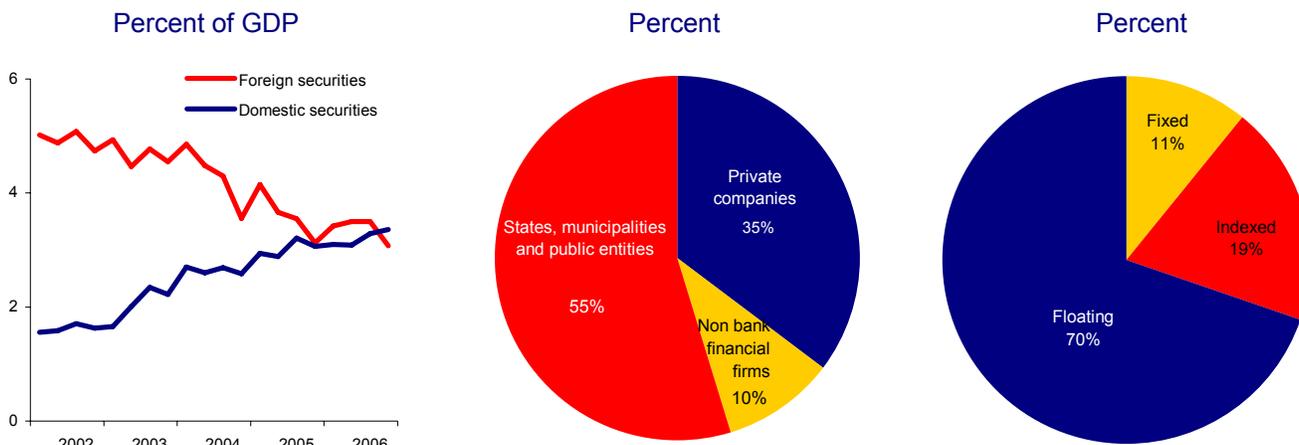
Figures at December 2006.
Source: Banco de México.

4.1.2.   Main investors

Commercial banks and brokerage houses

The most important holders of debt securities are commercial banks and brokerage houses. As of March 2007, such intermediaries' investment portfolio accounted for around 47 percent of government securities in circulation, including securities issued by IPAB, Banco de México, and FARAC (Graph 19).

Investment Funds Specialized in Retirement Savings (Siefores)

During the period analyzed by this report, Siefores increased the diversification of their portfolios, leveraging reforms implemented in recent years made to the investment regime applicable to them. In particular, fewer funds were invested in government securities and more were invested in private debt instruments, variable interest rate securities, and derivatives (Graph 20a). Starting in the second half of 2006, the growing sophistication of these intermediaries' investment strategies was accompanied by a considerable extension of the maturity of their debt portfolios. While in June 2006 the maturity of these institutions' government debt was 1,048 days; at the end of March 2007 it had risen to 1,860 days.

Graph 19
**Investors in Securities [1/]**

a) Investors in Consolidated Public Sector
Securities

Percent
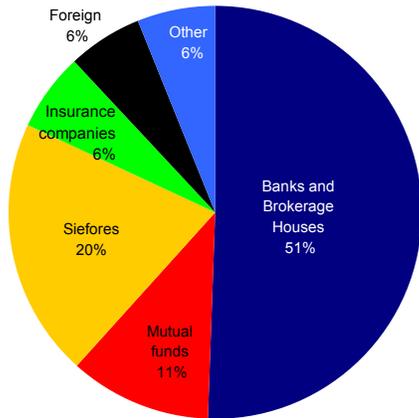
b) Bank and Brokerage House Investment
Portfolios

Percent
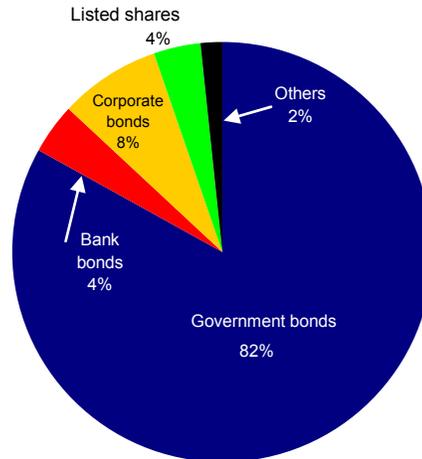
Figures at December 2006.
1/ Includes own security holdings and the net balance of the purchase and sale of securities via repo operations.
Source: Banco de México.

Mutual funds and insurance companies

At the end of March, close to 35 percent of investment fund portfolios consisted of variable interest rate securities, followed by fixed rate bonds (mostly short and medium term repo operations) and Cetes. A significant part of insurance companies' investment remained in long-term securities indexed at real interest rates. These institutions held 5 percent of Udibonos and 54 percent of CBICS outstanding at that date (Graph 20b y c).

Graph 20
**Main Investors' Portfolios**

a) Siefores

Percent
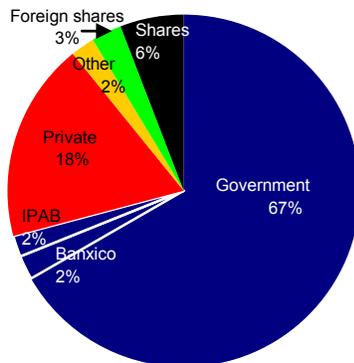
b) Investment Funds

Percent
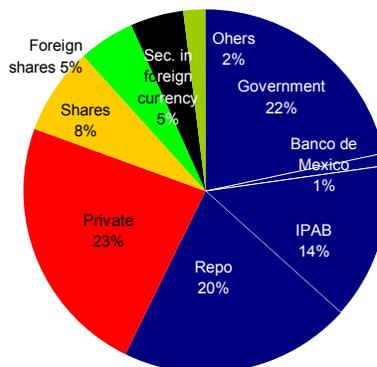
c) Insurance Companies

Percent
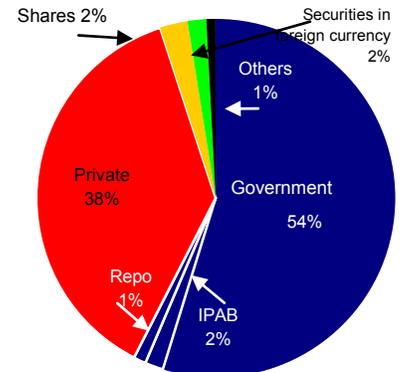
Figures at March 2007.
Source: Banco de México.

Box 4

Securitization of Assets in Mexico

Securitization consists of issuing obligations backed by flows associated to a package of financial assets. Such tool allows origination of financial assets, such as loans, to be separated from financing activities. Another reason for this type of operation lies in the fact that they enable the present value of flows from the corresponding assets, which tend to be relatively illiquid, to be obtained in a short period of time or, on other occasions, allow such assets to be removed from the balance of the company which originated them.

Securitization normally implies grouping assets which generate similar flows and then transferring them to a trust fund, which for legal reasons, is set up separately from the entity that originally issued such assets. Meanwhile, the trust fund issues debt instruments guaranteed by such assets, whose flows are used to service the corresponding liabilities. Securitization normally isolates the payment capacity of underlying assets from the credit rating of the entity that issued them.

Securitization of assets is a relatively new practice in Mexico, which has become more important due to the creation of stock certificates. Since the first issue of medium-term stock certificates in August 2001, this instrument has been used to securitize a wide range of assets. The first securitization through stock certificates was carried out by the Municipality of Aguascalientes, which on December 11, 2001 securitized its participatory revenues for 90 million pesos at a term of six years. As for the private sector, on December 13, 2001 a mortgage Sofol issued a stock certificate for 750 million pesos at a term of seven years, securitizing loans granted to housing developers.

Although a wide range of assets can be securitized, the operation in Mexico has been mainly concentrated in two areas: securitization of mortgage credits and toll road revenues. At the end of December 2006, the issuance of bonds backed by some type of assets rose to 113.4 billion pesos, of which 61.6 were placed by the private sector, figure representing 22.5 percent of total private securities outstanding.

Private Securities and Other Public Sector Securities
Billion pesos
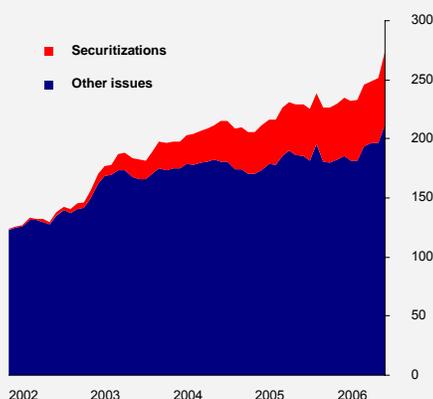
Other Public Securities */
Billion pesos
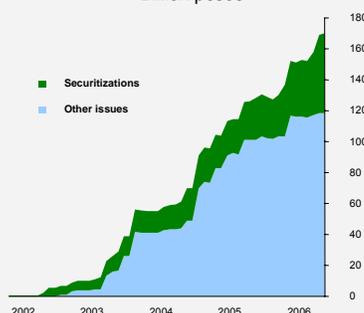
Securitizations by Underlying Asset
Billion pesos
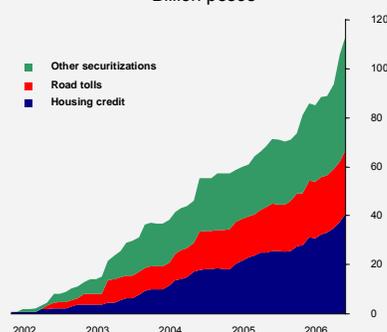
Figures at December 2006.
*/ Other public securities include the securities issued of federal entities, municipalities and decentralized organizations. It does not include FARAC.

Financial intermediaries in Mexico, mainly mortgage Sofoles and Infonavit, have maintained a strategy of securitizing part of their mortgage portfolios in order to improve asset turnover and, thereby, expand loan generating operations (see Box 19 "Securitization of Mortgage Assets in Mexico").

Regarding the securitization of other assets, the issuing of stock certificates backed by toll road revenues is noteworthy in Mexico. There are currently 14 such issues amounting, at November 2006, to 24.4 billion pesos, of which 15.8 billion correspond to the private sector and the remaining 8.6 billion were made by state and municipal governments.

There are also securitization operations associated to underlying assets, such as corporate loans, credit to consumption portfolio collection, television air time income from and securitization of participatory revenues. At the end of December 2006 such operations amounted to 46.6 billion pesos.

Finally, it is important to underline the securitization of IPAB promissory notes carried out by various banks. From December 2004 to January 2005, 74.9 billion pesos of stock certificates were issued, guaranteed by IPAB credit flows and at 5-year terms. Such instruments have already mainly been sterilized by prepayment of IPAB loans.

Foreign investors

Foreign investors' participation in the Mexican market was driven by their interest in long term fixed rate investments. The participation of these investors contributed to increased liquidity and depth in Mexico's debt market. It is also worth mentioning that foreign investors reduced their bond holdings starting in the second half of 2006 (Graph 21 a and b), in response to the return of global interest rates to their normal cycle and lower interest rates in Mexico. As shown below, another financial instrument to which foreign investors widened their exposure in pesos was the interest rate swap market contract.

Graph 21
Foreign Investors Holdings of Government Securities

a) Federal Government Securities | b) Fixed Rate Bonds | c) Bonds Holdings by Term

Percent of total amount outstanding | Billion pesos | Percent of total amount outstanding
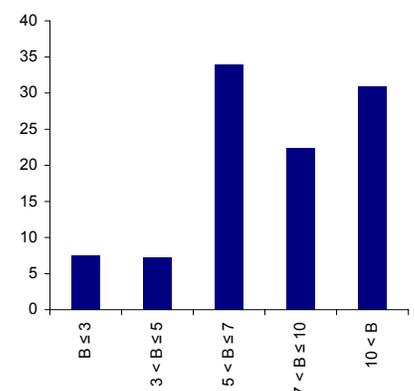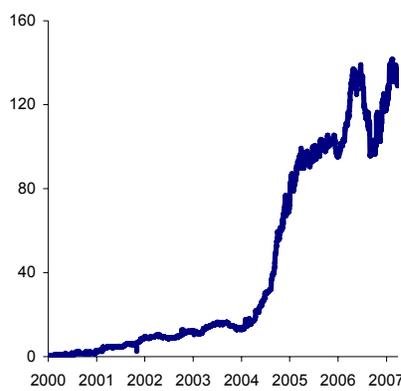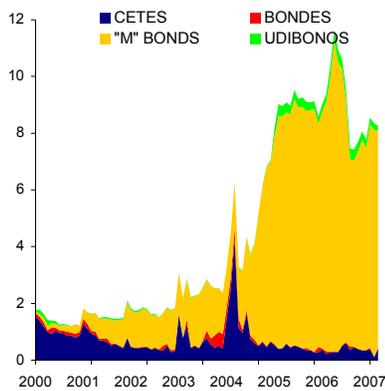
Figures at March 2007.
Source: Banco de México.

4.1.3.   Secondary market

During the period analyzed, the highest number of operations and largest movements were in federal government securities, particularly long-term fixed interest rate liabilities. The turnover of such securities, defined as the operation volume divided by the total number of securities issued, declined as a result of the growing participation of institutional investors, who tend to maintain securities as part of their balance for longer periods of time (Graph 22c). Meanwhile, the progressive reduction of bid-ask spreads confirms the depth that the secondary market has gradually reached.(Graph 22a).

Graph 22
Liquidity and Depth of Securities Issued by the Consolidated Public Sector

a) Bid ask spread [1/]

Basis points
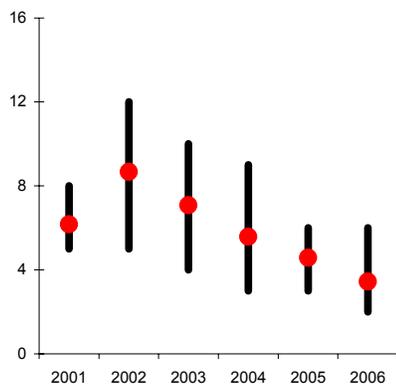
b) Daily turnover [2/]

Number of times
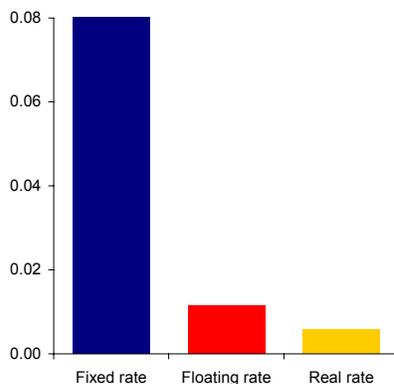
c) Daily turnover [3/]

Number of times
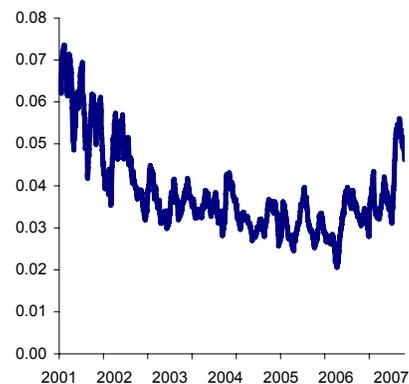
1/ Interval between the maximum and minimum bid ask spread, and the average annual spread of the most liquid federal government security.
2/ Average daily operated volume of public sector debt instruments divided by the total balance of public sector debt instruments in circulation between January and March 2007.
3/ Figures at March 2007. 20-day moving average of the daily operated volume of public sector debt instruments divided by the total balance of public sector debt instruments in circulation.
Source: Banco de México.

Box 5
Security Segregation

The Ministry of Finance's (SHCP) Regulation on securities stripping and reconstitution of securities was passed in March 2005. This regulation establishes the separation of the interest and principal of a security into independent instruments that do not pay periodic interest (zero coupon). These "Stripped Bonds " can be operated independently in the secondary debt market. In the opposite way, it is also possible to reconstruct a security from the corresponding "Stripped" ones.

Through strip bonds, the Ministry of Finance fosters the development of the zero coupon interest rate curve, which usually encourages better price formation and greater flexibility in structuring investment instruments. According to the Regulations, all fixed-rate Bonds outstanding and Udibonos can be stripped.

Strip bonds as a proportion of total securities
Percent
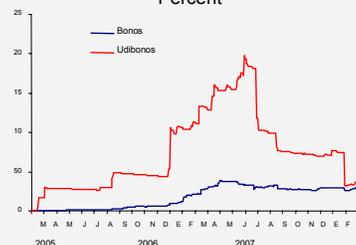
Source: Banco de México
Figures at March 2007

Box 6

<div style="border:1px solid">

Repo Operations and Securities Lending

The regulatory framework surrounding repo operations and securities lending has been significantly modernized during recent years. The new rules, described in Banco de Mexico's newsletters 1/2003 and 1/2004, are intended to encourage a more complete and efficient securities market, while at the same time, reduce the inherent risk of such operations.

Repo operations are those in which one party purchases a security with the commitment to return it at the end of an agreed term, receiving the original sum of money plus a premium. Meanwhile, securities lending consists of transferring securities from one party to another, who promises to return the same securities plus a premium at the end of an agreed term.

The main difference between these operations is that in a repo the seller is seeking to obtain funds for which they are willing to pay a premium, while in securities lending, it is the borrower who is willing to pay a premium for the temporary possession of a certain security.

Repo and securities lending operations foster development of the money market which facilitates, among other operations, security short sales, sterilization of buy/sell operations and risk coverage in interest rate swap markets. Intensive use of the securities lending window in Banco de México has confirmed the value of such instrument. The aforementioned window, access to which is restricted to market makers, allows users to request government securities on loan, in return for a premium equal to 5 percent of the bank financing weighted interest rate.

Although repo operations continue to be negotiated at relatively short terms and security lending has remained practically unused, during the second half of 2006 authorities and investors carried out various actions to promote the use of such instruments. In particular, obstacles hindering some institutional investors from participating were removed, regulations simplified and private negotiation mechanisms established for security lending operations.

Breakdown of repo operations
Percent of total operations
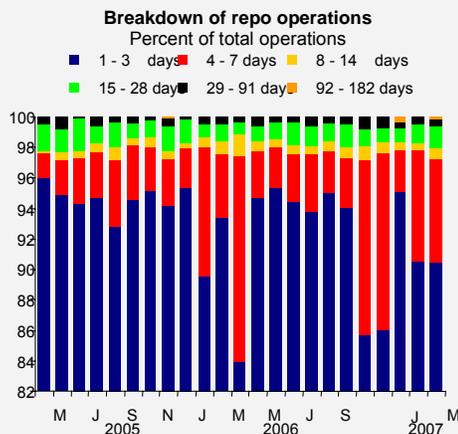
Evolution of the securities lending window
Million pesos
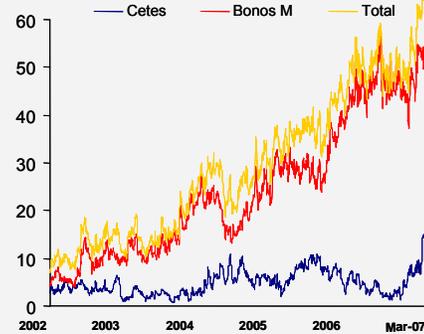
Source: Banco de México
Figures at March 2007.

</div>

4.2. Foreign exchange market

In 2006, the volume of operations in the foreign exchange market was greater than in the two previous years. There was an increase in the number of market participants as well as in the volume operated (Graph 23). In fact, the peso was among the ten most operated currencies in the world. Higher operation volumes and the convergence of peso fluctuations towards levels similar to, and on occasions lower than, other currencies in this group (Graph 24b) have been reflected in decreased bid-ask spreads (Graph 24c). Higher peso transaction volumes and the extension of its trading operation to a greater number of financial traders have led Banco de México to consider including the Mexican peso in the international currency payment system operated by the Continuous Linked Settlement Bank (CLS),[29] as is the case for currencies with higher global liquidity.

[29] The CLS was set up in September 2002 in New York. Its main shareholders are 71 financial organizations from different parts of the world. This institution was specifically designed to carry out currency transaction payments via a PvP (payment vs payment) arrangement, which practically eliminates counterparty non-settlement risk. The CLS Bank currently operates in 15 currencies: the Australian, Canadian, New Zealand, U.S., Singapore and Hong Kong dollars; the yen; the euro; the Swiss franc, the Danish, Norwegian and Swedish crowns; the British pound, the South African rand, and the Korean won.

Graph 23
Exchange market

a) Daily Operated Volume in Mexico's Exchange Market

Billion US dollars (10-day moving average)

b) Average Daily Volume in the OTC Peso US Dollar Market

Percent

c) Average Daily Spot Volume

Billion US dollars
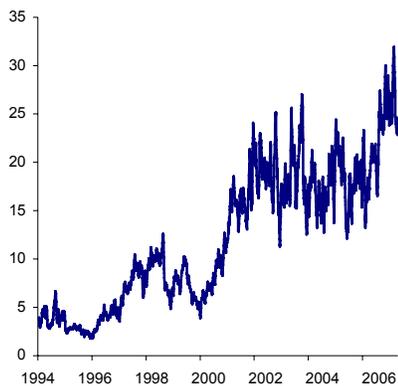
Figures at March 2007.
Includes spot operations, forwards, futures and swaps.
Source: Banco de México.
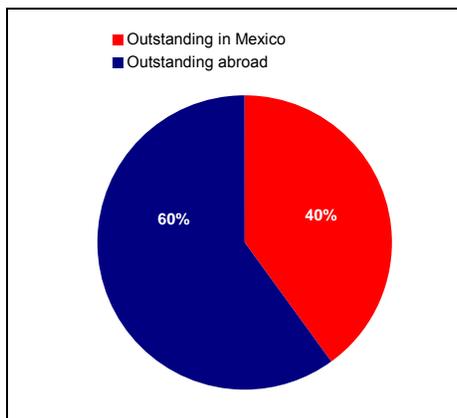
Figures at October 2006.
The volume of peso operations was estimated using data from the Foreign Exchange Committee (FXC) exchange survey and information on Banco de Mexico's daily exchange market operations.
Source: Banco de México, Federal Reserve Bank of New York FXC Survey and BIS.

Graph 24
Foreign Exchange Market

a) Volume Operated at Different Times

Number of events per minute

b) Implicit Volatility of Exchange Rate Options at one Month

Percent
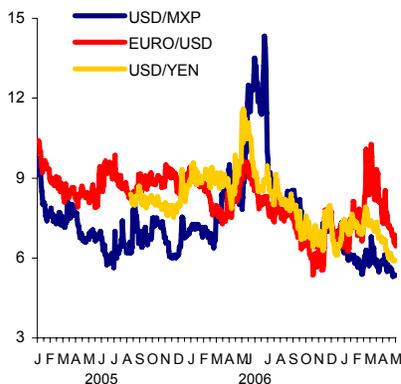
c) Peso Bid/ask Spread

Percentage difference

Operations of March 2007.
Source: Reuters.

Figures at May 2007.
Source: UBS.
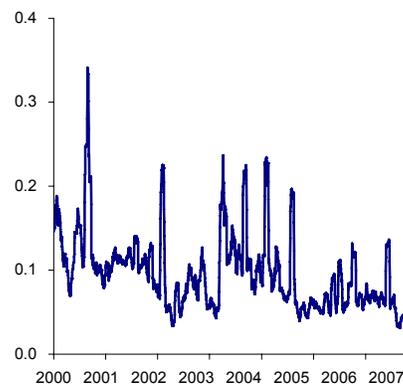
Figures at May 2007.
Source: Banco de México.

4.3. Derivatives market

The risks inherent in a free floating exchange rate regime and a long-term debt market have fostered the development of exchange traded and over the counter (OTC) derivatives markets in Mexico. Such markets complement one another and have developed in parallel.[30]

4.3.1. Over the Counter Market (OTC)

The main attraction of OTC derivatives contracts is their flexibility. In Mexico, a futures market with maturities of up to ten years has been developed for the peso. The peso options market has continued to grow in line with the peso's trading operation schedule (Graph 24a) and as the number of financial traders who deal in it have increased, a situation which enables delta hedging of options portfolios.[31] As can be seen in Graph 25, a significant volume of commercial bank forwards, swaps, and exchange rate options are carried out by foreign counterparties, enabling risk diversification outside the Mexican financial system.

Graph 25
Commercial Banks' Main Counterparties in
Exchange Rate Derivatives Operations[1/]

a) Exchange Rate Forwards
Percent
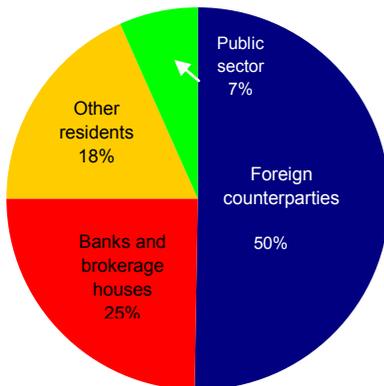
b) Exchange Rate Swaps
Percent
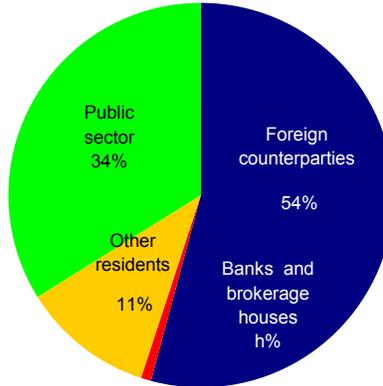
c) Exchange Rate Options
Percent
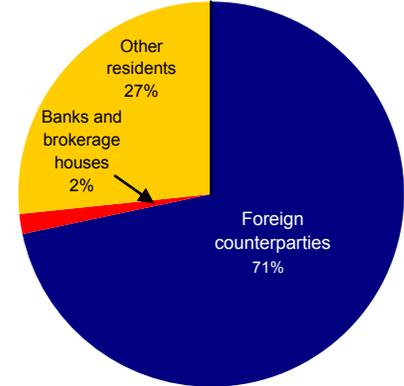
Average observed during 2006.
1/ Excludes OTC operations outside Mexico.
Source: Banco de México.

Most OTC operations made with interest rate derivatives are structured via TIIE referenced swaps. The participation of foreign financial entities in such operations is noteworthy, especially commercial banks with affiliates in Mexico and hedge funds. These foreign investors have contributed to an important rise in the liquidity and depth in the derivatives market by actively managing their peso

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[30] The over the counter market (OTC) offers greater flexibility than exchange traded markets (in maturities and contract characteristics) in order to satisfy particular investment or coverage needs. However, exchange traded markets are generally more liquid than OTC markets due to the standardization of their contracts and the mitigation of credit risks in their clearing houses. In general, exchange traded markets are mostly used by financial institutions seeking to cover risks acquired in OTC operations.

[31] An increase in the number of financial institutions trading a currency and enhanced operation schedules reduce the possibility of sudden exchange rate gaps which normally occur when currency traders are closed.

positions and using the swaps market to reduce or increase their peso interest rate exposure (Graph 26).

Graph 26
Interest Rate Derivatives
a) Interest Rate Swaps' Operation Volume   b) Commercial Banks' Main Counterparties in Interest Rate Swaps

Trillion pesos   Percent
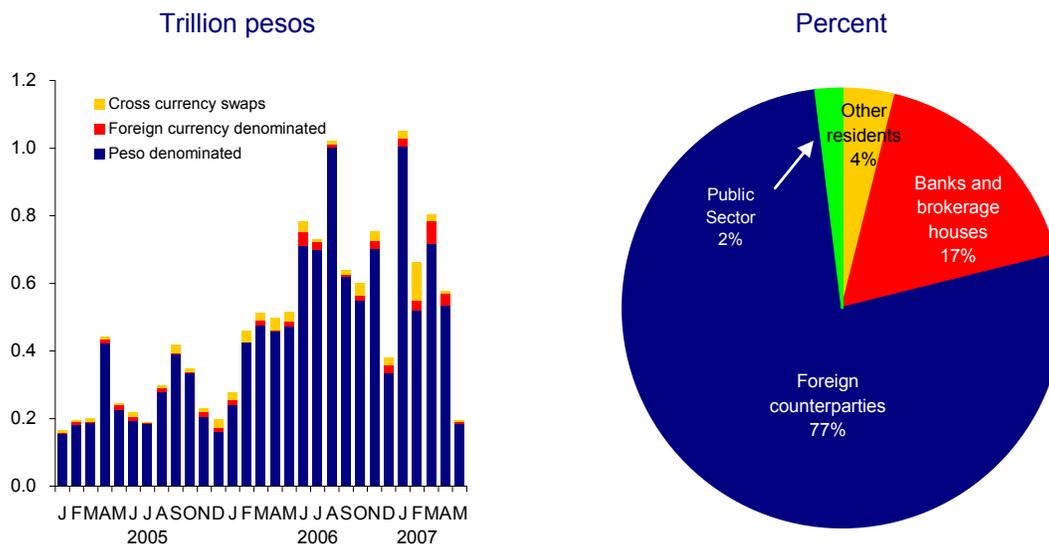
Figures at May 2007.
Source: Banco de México.

4.3.2.   Exchange Traded Derivatives Markets

Exchange traded derivatives are mainly operated in the Mexican Derivatives Market (Mercado Mexicano de Derivados, MexDer) and the Chicago Mercantile Exchange. The first of these markets offers interest and exchange rate futures, while the latter deals only in peso futures. The operated volume and open interest rates of peso/dollar futures continued to increase significantly during 2006. Peso/dollar futures began to develop in 2004 after the introduction of 24 and 48 hour contracts, which enable structuring and operation of synthetic "stapled" swaps. In the fourth quarter of 2005, operation of peso/euro futures started, and in the third quarter of 2006, peso/dollar options began to be offered.

Regarding interest rate contracts, the most active instrument on MexDer has been the 28-day TIIE future instrument. This is mainly due to the fact that the TIIE is an important reference in the Mexican financial market since a large proportion of floating interest rate debt is indexed to it. Negotiated 28-day TIIE contracts offer different monthly based consecutive series for up to ten years, as well as successive contract series, known as staples, which emulate interest rate swaps (Graph 27a).

Graph 27
MexDer Operations

a) 28-day TIIE Futures	b) Main Operators[1]	c) Position by Investor[1]
Trillion pesos	Percent	Percent
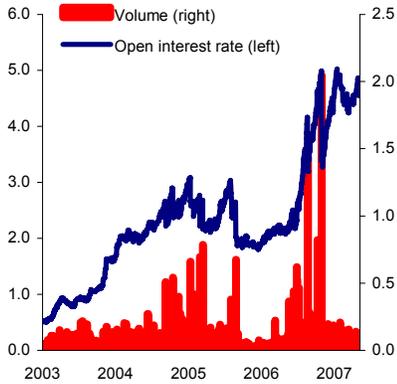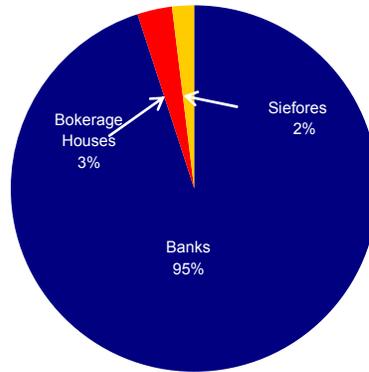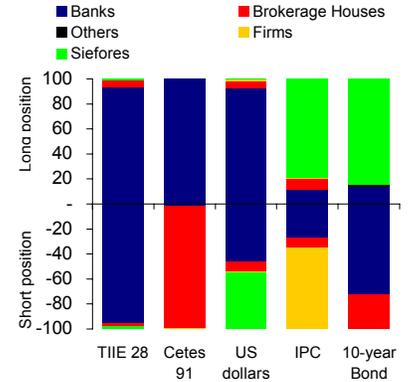
Figures at March 2007.
1/ Percent of total contracts negotiated.
Source: MexDer and Asigna.

Box 7

Peso speculative positions in the International Monetary Market (IMM)

Every Friday at 3.30 p.m. New York time, the Commodity Futures Trading Commission (CFTC), publishes a report known as "The Commitments of Traders" (COT). This document provides information from different stock exchanges regarding futures contract operators' positions.

The COT report shows which current positions (open interest) are for trading purposes and which are speculative, classifying the latter as short and long term positions. Speculators' perception about the future behavior of underlying assets can be inferred from the balance between short and long term positions.

Of particular interest to Mexico are speculative positions of peso futures traded in the IMM of the Chicago Mercantile Exchange. Such positions are an indicator of operators' perception regarding each currency and, thereby, of possible future currency movements. The correlation observed between speculative positions in the IMM and peso movements has reached high levels.

Peso speculative positions in the IMM
Left: billion US dollars; Right: pesos per US dollar
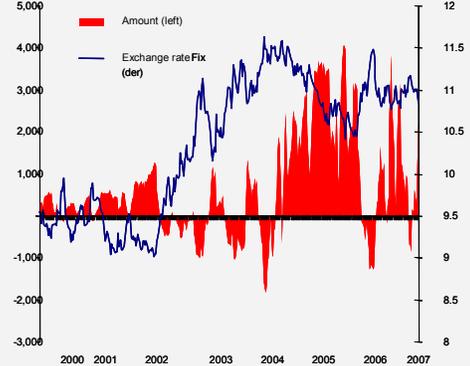
Source: CFTC and Banco de México
Figures at May 2007.

5. Commercial Banks

Commercial banks are the most important financial intermediaries in Mexico due to the amount of funds they manage and the fact that they alone have access to the so-called safety net (Table 4).[32] For these reasons, the first edition of this publication pays special attention to the current situation in the commercial bank sector. The first part of this chapter presents the evolution of profitability indicators, a study of operating profit components, and the evolution of income from net interest margin, trading, and fees and commissions. The second part analyzes bank solvency indicators, while the third studies credit, market, liquidity, and contagion risks. The chapter ends with the results of several studies prepared by Banco de México regarding competition in the bank credit market, commission behavior, and important measures implemented by the central bank to promote competition. Throughout the following section emphasis is given to data for the six largest banks, which, as of December 2006, administered 85.6 percent of the commercial banking sector's assets.[33]

Table 4
Structure of the Financial System

	Assets	Participation	Annual change in real terms	HHI[2/]
	Million pesos	**Percent**	**Percent**	
Commercial Banks [1/]	3,359,217	53.60	10.7	1,489
Siefores	740,176	11.81	18.6	941
Mutual Funds	707,408	11.29	32.6	148
Development Banks [1/]	598,143	9.54	-16.5	-
Insurance Companies	378,647	6.04	6.6	614
Sofoles	212,913	3.40	-3.1	798
Brokerage Houses [1/]	181,543	2.90	25.9	987
Leasing Companies	30,548	0.49	17.9	730
Credit Unions	21,667	0.35	17.9	407
Factoring Companies	15,806	0.25	-5.2	1,618
Bonding Companies	9,974	0.16	5.5	1,546
Exchange Houses	5,560	0.09	9.6	1,233
Deposit Warehouses	5,027	0.08	7.1	1,519

Figures at December 2006.
1/ Includes securities financed through repo operations.
2/ The Herfindahl Hirschman Index (HHI) is the sum of the squares of economic agents' participations. The value of such index can be between zero and ten thousand. The higher its value, the greater the market concentration.
Source: Banco de México, CNBV, Consar and CNSF.

Most financial intermediaries, including banks, are organized as financial groups (Box 8). As of December 2006, there were 40 commercial banks in Mexico, managing over half of the funds intermediated in the financial system. Although commercial banks have been losing ground to other financial intermediaries, such as Afores (retirement fund administrators) and mutual funds, it is still the most important type of institution in the financial sector.

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[32] The safety net consists of a deposit insurance administered by IPAB and the possibility of access to Banco de México's liquidity.
[33] Assets considered include repo financed securities registered off balance .

Box 8

Financial Groups

Financial intermediaries can organize themselves in Financial Groups in order to act as one before their customers and the general public. Being part of a Financial Group (Grupo Financiero, GF) enables member institutions to use the same name, leverage each others infrastructure for cross-selling products and services, and display greater financial strength.

The Financial Groups Law (Ley para Regular las Agrupaciones Financieras, LRAF) establishes GF regulation. A GF must be formed by a Financial Holding Company controlling at least two of the following institutions, which can be of the same type: commercial bank, brokerage house, insurance company, warehouse, financial leasing company, financial factoring company, exchange house, bonding company and multi-purpose non-bank banks (Sofomes). A GF cannot be formed with just two Sofomes.

Financial Holding Companies are set up as limited liability companies to hold shares issued by the different members of a GF. In this vein, they must at all times hold at least 51 percent of each GF member's capital and control shareholders' general meetings.

Financial Holding Company Shareholders
Any individual or firm can participate in the social capital of a Financial Holding Company of a Financial Group, except foreign companies with governmental functions.

Responsibility Agreement
Financial Holding Companies and financial entities which belong to a GF must subscribe a responsibility agreement through which the Holding Company commits to support in a subsidiary and unlimited way the obligations and losses of each GF member.

In the event that the Holding Company's capital is not sufficient to respond to the losses of one or more of the financial institutions within the GF, these will be covered, firstly, in the commercial bank of the GF and then in the remaining member institutions until all the Holding Company's capital is finished (Art. 28 fraction II LRAF).

The LRAF prohibits Financial Holding Companies in a GF from holding direct investments in non-financial firms' capital. However, the Credit Institutions Law (Ley de Instituciones de Crédito, LIC) does allow commercial banks to invest in non-financial firms as long as they abide by the limits established in article 75 of that same Law.

Structure of a Financial Group
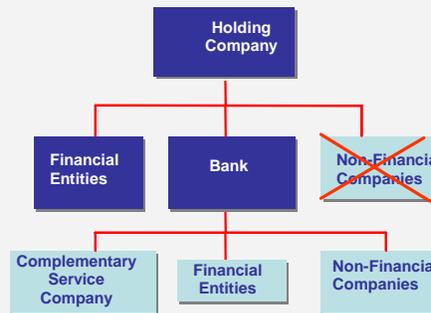
Proportion of assets belonging to a Financial Group (2006):

	Belong to GF (percent of total assets)
Commercial banks	96.7
Siefores	73.3
Mutual funds	84.0
Insurance companies	47.1
Brokerage houses	70.6
Sofoles	17.0
Leasing companies	60.5
Factoring companies	65.7
Bonding companies	33.3
Warehouses	15.4
Exchange houses	3.7

Source: CNBV, CNSF, Consar and Banco de México

During 2006, the Ministry of Finance (SHCP) granted charters to twelve new banks.[34] It is important to mention those where the main shareholders are retail business organizations or financial groups owned by retail business organizations. This type of firm's incursion into the banking business, which began in Mexico in 2002, will encourage competition in the sector, particularly in the consumer credit market. It is also expected to help introduce significant sections of the population to formal banking services.

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[34] Licences were granted to the following banks: Banco Autofin México, Banco Compartamos, Banco Ahorro Famsa, Banco Multiva, Banco Regional, UBS Bank México, Barclays Bank México, Banco Wal-Mart de México Adelante, Banco Comercial del Noreste, Banco Fácil, BanCoppel, and Prudential Bank.

5.1. Profitability

In 2006, commercial banks' operating profits[35] amounted to 99.8 billion pesos, a 22.5 percent increase in real terms compared to the previous year. Meanwhile, net profits were 66.7 billion pesos, implying an increase in real terms of 33.8 percent during the same period. The difference between operating profit (pre-tax profit) and net profit (after tax and subsidiaries results) is mainly explained by tax payments, which totaled 27.1 billion pesos in 2006.

Graph 28
Profitability (Six Largest Banks)

a) Net Profit as a Proportion of Average Equity (ROE)

b) Net Profit as a Proportion of Total Assets (ROA)

c) Loan Loss Reserves as a Proportion of Total Income

Percent
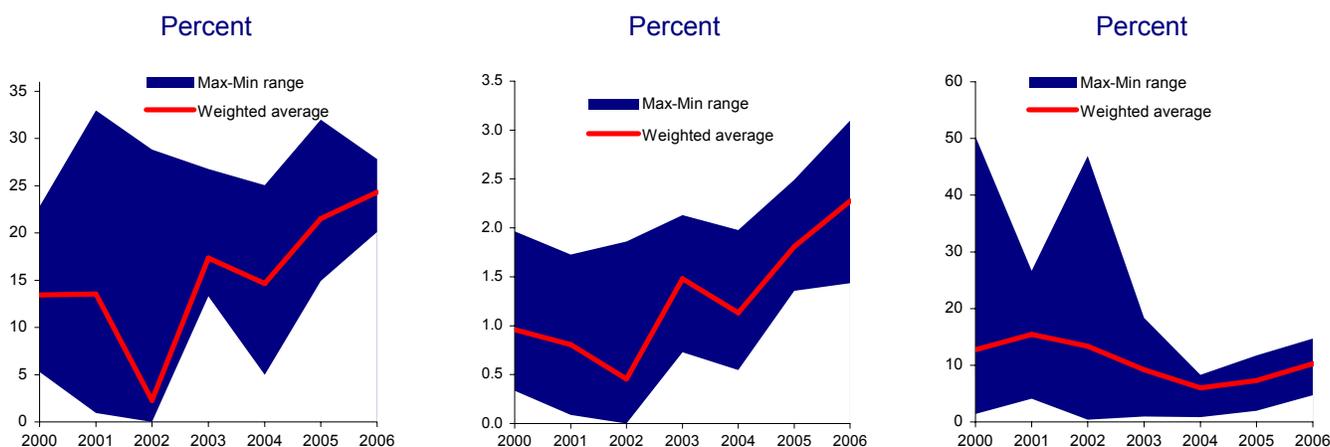
Percent

Percent

Figures at December 2006.
Average weighted by the amount of assets.
Source: CNBV.

During 2006, commercial banks' average profitability measured as a proportion of equity (return on equity, ROE) was 24.3 percent for the six largest banks (Graph 28a), 8.6 percent for small subsidiaries of foreign banks, and 7.7 percent for the remaining banks.[36] Meanwhile, net profits as a proportion of assets (return on assets, ROA) was 2.3 percent for the six largest banks during 2006 (Graph 28b). Also of note, loan loss reserves as a proportion of total income rose in 2005 and 2006 (Graph 28c).

The rise in commercial banks' profitability, particularly for the six largest banks, can be attributed to three factors: an improvement in their balance mix, an increase in credit to households, and the population's greater use of banking

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[35] Operating profit is calculated before tax, accounting adjustments, subsidiaries' results, and the monetary net result originated by inflation adjustments (Repomo). For further infomation on Repomo see Financial Information Regulations (Normas de Información Financiera, NIF) press release B-10.

[36] Average net profit (profits after taxes) weighted by the size of each bank's assets. The six largest banks are Banco Mercantil del Norte, Banco Nacional de México, Banco Santander, BBVA Bancomer, HSBC, and Scotiabank Inverlat. Figures for BBVA Bancomer include BBVA Servicios. Small affiliates of foreign banks are: ABN AMRO Bank, American Express Bank, Banco Credit Suisse First Boston, Banco J.P. Morgan, Bank of America, Bank of Tokyo-Mitsubishi, Deutsche Bank, GE Money Bank, ING Bank, and Barclays Bank. The other remaining banks are: Banca Afirme, Banca Mifel, Banco Azteca, Banco del Bajío, Banco Inbursa, Banco Interacciones, Banco Invex, Banco Regional de Monterrey, Banco Ve por Más, Bansi, Ixe Banco, Banco Compartamos, Banco Monex (previously Comerica Bank), and Banco Autofin. The six largest banks administer 85.6 percent of commercail banks' total assets (including repos); small affiliates of foreign banks administer 5 percent, and the remaining banks, 9.4 percent.

services. The first two factors are reflected in the growth of risk-weighted-assets (RWA) as a percentage of total assets (Table 5, column C) and in the proportion of earning assets to interest bearing liabilities (Graph 29c). This change in commercial bank financial structure has significantly widened net interest income. Furthermore, the increased use of banking services has been accompanied by a considerable rise in revenue from fees and commissions.

Thus, while in 2000, 11 cents per peso of income became operating profit, in 2006, this indicator was 44 cents per peso of income (Table 5, column A). Finally, the ratio of assets to equity declined (column E) as more capital was required to sustain the increase in risk-weighted assets.

Table 5
Profitability Components (Six Largest Banks) [1/]

	Operating profit taxes/ Total Income	Total Income / RWA	RWA / Total Income	Operating profit taxes / Total Assets	Total Assets/ Equity	Operating profit taxes/ Equity
	(A)	(B)	(C)	(D) = A×B×C	(E)	(F)= D×E
	Percent	Percent	Percent	Percent	Times	Percent
2000	11.3	12.0	48.9	0.7	15.0	9.9
2001	17.3	13.3	45.6	1.0	14.2	14.9
2002	15.0	13.3	44.9	0.9	12.9	11.5
2003	29.3	12.6	50.5	1.9	11.4	21.3
2004	33.6	11.5	56.7	2.2	11.4	24.9
2005	42.3	12.0	57.9	2.9	11.4	33.5
2006	44.4	12.6	60.7	3.4	11.1	37.7

Figures at December 2006.
1/ Figures in this table were obtained by averaging data from the six largest banks. Operating Profit was used instead of Net Profit in order to exclude extraordinary profits, Repomo and taxes. As a result, these figures differ from those in Graph 28 a and b, which show Net Profit as a percentage of Equity and Total Assets.
Risk-weighted-assets are those which values vary with changes in interest rates, exchange rates or borrowers credit ratings. They are known as such due to the fact that, according to capital adequacy regulation, they must be multiplied by a risk weight in order to estimate a bank's capital adecuacy ratio (Box 10).
(Operating Profit / Total Assets) = (Operating Profit / Total Income) × (Total Income / RWA) × (RWA / Total Assets).
(Operating Profit / Equity) = (Operating Profit / Total Income) × (Total Income / RWA) × (RWA / Total Assets) × (Total Assets / Equity).
The methodology can be consulted in: Bank of England, Financial Stability Review, No. 15, p.74, December 2003.
Source: Banco de México and CNBV.

The growth of income, together with efforts to contain administrative costs, has contributed to the favorable evolution of the efficiency index for the six largest banks.[37] This index rose from 73 percent in 2000 to 47.8 percent in December 2006 (Graph 29b). During 2006, 70.5 percent of the revenue of the six largest banks came from their net interest income,[38] 6.9 percent from trading,[39] and the remaining 22.6 percent from net fees and commissions[40] (Graph 30).

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[37] The efficiency index is the ratio of administrative costs to total revenues.
[38] The net interest income is the difference between interest earned and interest paid, including repo premiums. Although monetary net results originated by inflation adjustments (resultado por posición monetaria, or repomo) are usually added to the net interest income, in this report they are not included.
[39] Trading income stems from profits and losses from the purchase and sale of securities, foreign currencies, and the revaluation of positions in securities. See section 5.1.2.
[40] This figure refers to the difference between charged and paid commissions.

Graph 29
Profitability Components (Six Largest Banks)

a) Operating Profit as a Proportion of Total Income	b) Efficiency Index: Administrative Costs as a Proportion of Total Income	c) Earning Assets as a Proportion of Interest Bearing Liabilities
Percent	Percent	Number of Times
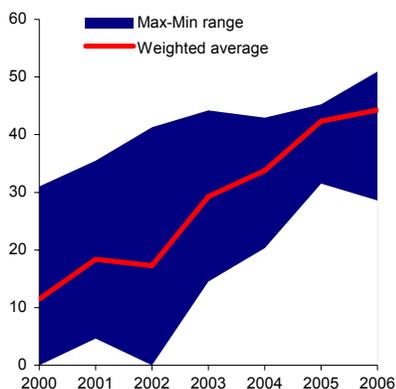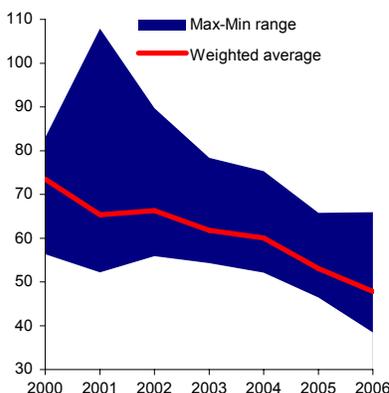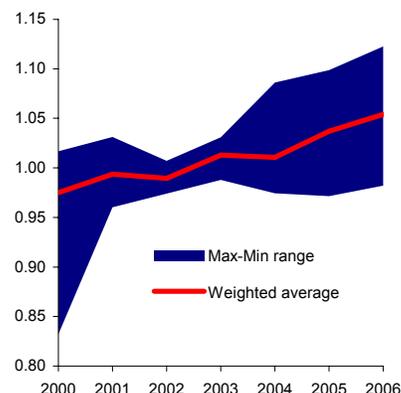
Figures at December 2006.
Source: Banco de México and CNBV.

Graph 30
Bank Income (Six Largest Banks)
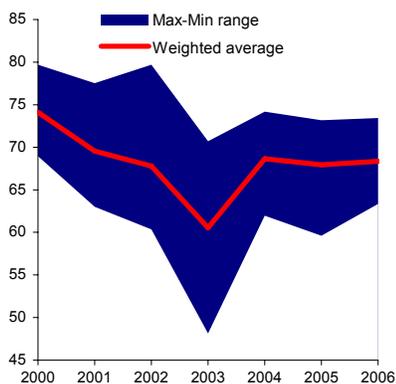
a) Net Interest Income as a Proportion of Total Income	b) Income from Trading as a Proportion of Total Income	c) Income from Fees and Commissions as a Proportion of Total Income
Percent	Percent	Percent
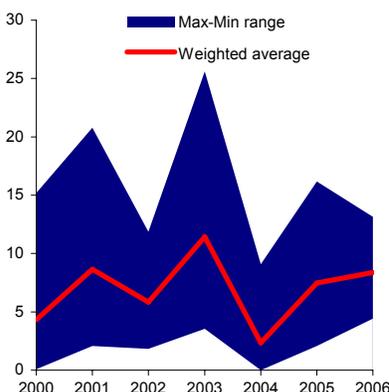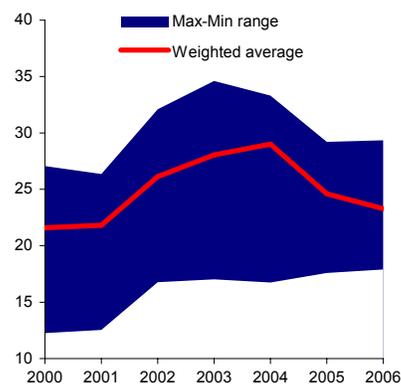
Figures at December 2006.
Average weighted by the amount of assets.
Source: CNBV.

5.1.1.   Net interest income

In 2006, the net interest income of the six largest banks rose 21.4 percent in real terms compared to that observed in 2005. This result was obtained despite the fact that the spread between lending interest rates and average funding costs did not increase during the period. Table 6 shows the results of a study evaluating the relative contribution of factors that explain variations in net interest income.

The growth in net interest income in 2006 was the highest recorded during the last six years (Table 6, columns A and B). Change in the composition of assets and liabilities (column D) was the factor that, until 2004, had most helped offset the impact of reductions in the spread between lending and deposit interest rates (column E). Nonetheless, since 2005, the rising volume of intermediated resources has been the most important contributor to the increase in net interest income (column C).

Table 6
Net Interest Income [1/] (Six Largest Banks)
Million Pesos

Year	Net Interest Income	Annual Change	Structure of Annual Change			
			Volume effect	Assets and liabilities structure effects	Interest rate spreads effect	Mixed effect
	(A)	(B)	(C)	(D)	(E)	(F)
2000	74,807					
2001	73,773	-1,034	7,074	380	-11,271	2,783
2002	69,427	-4,346	3,107	5,337	-14,648	1,858
2003	70,387	960	2,420	11,954	-15,590	2,176
2004	87,561	17,174	7,603	7,897	435	1,240
2005	110,754	23,194	22,203	-2,746	-1,597	5,353
2006	138,600	27,846	17,910	10,872	-619	-317

Figures at December 2006.
Column A shows net interest income for the six largest banks.
Column B is the annual variation of net interest income, and is equal to the sum of C, D, E and F.
Column C is the change in the net interest income derived from an increase in resources intermediated by the six largest banks.
Column D is the change in the interest margin produced by variations in the structure of assets and liabilities. For instance, the increase in the relative importance of credit to consumption.
Column E is the change in the net interest income resulting from variations in interest rate spreads.
Column F corresponds to the combined effects.
The methodology employed can be consulted in: Cebrián Carrasco, J., "Margen de intermediación de las entidades de depósito", Financial Stability, No. 6, May 2004, Bank of Spain.
1/ The net interest income excludes the monetary net result originated by inflation adjustments (Resultado por posición monetaria, Repomo), as well as income and expenditure updates.
Source: CNBV and Banco de México.

The growth of bank credit in recent years has enabled financing to the private sector to account for 33.1 percent of commercial banks' total assets. However, the participation of credit to the private sector in Mexico continues to be relatively low compared to countries such as Chile, Colombia, Peru, Spain, Canada, and the U.S. (Graph 31b).

Despite the lower participation of financing to the private sector in Mexican commercial banks' assets, net interest income, measured as a percentage of assets, is higher in Mexico than in most of the countries mentioned above (Graph 31c). This result implies that the spread between lending and deposit interest rates in Mexico is high.

Graph 31
Credit to the Private Sector and Net Interest Income

a) Net Interest Income as a Proportion of Assets Six largest banks	b) Bank Financing to the Private Sector as a Proportion of Assets[1/]	c) Net Interest Income as a Proportion of Assets[1/]
Percent	Percent	Percent
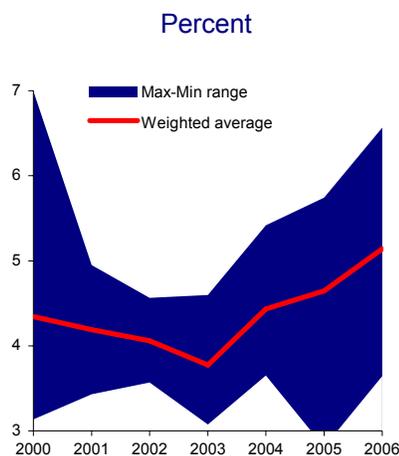
Figures at December 2006.
Average weighted by amount of assets.
Source: CNBV.
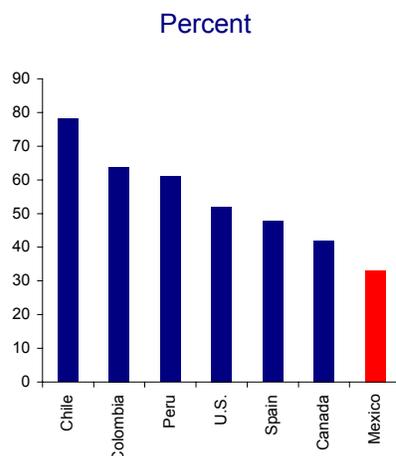
Figures at December 2006 for Chile, Colombia, Peru, the U.S., Canada and Mexico. At September 2006 for Spain.
1/ Assets include securities financed through repo operations.
Source: Chile, data from the Superintendencia de Bancos e Instituciones Financieras (SBIF); Colombia, data from Superintendencia Financiera de Colombia; Peru, data from Superintendencia de Banca, Seguros y AFP (SBS); Mexico, data from the National Commission on Banking and Securities (CNBV); U.S., data from the Federal Deposit Insurance Corporation (FDIC); Spain, data from Banco de España, and Canada, data from the Office of the Superintendent of Financial Institutions (OSFI).
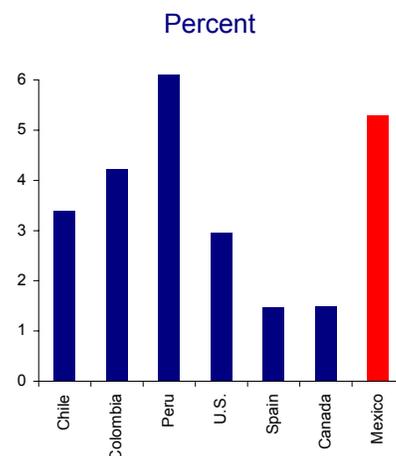
Among the factors that could explain the relatively wide spread between lending and deposit interest rates in Mexico are the following:

i) Less competition in granting credit, as well as in attracting deposits.[41]

ii) Relatively higher credit risk.[42]

iii) Higher foreclosure costs for problematic loans.[43]

iv) Lower bank penetration, meaning that commercial banks, in order to grow, have to incur greater costs and risks due to the lack of available information on new customers' credit ratings.

v) Higher regulatory costs.[44]

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[41] An indirect method of evaluating the level of competition is through efficiency. One measure of efficiency is the ratio of administrative costs to total assets. This ratio is 3.7 percent in Mexico, 5.3 percent in Colombia, 4.5 percent in Peru, 2.1 percent in Chile, 1.8 percent in the U.S.A., 2.1 percent in Canada, and 1 percent in Spain. See: Demirguc-Kunt, A. and Levine, R., (1999), Bank-based and market-based financial systems: cross-country comparisons, Policy Research Working Paper Series No. 2143, World Bank., and Gelos, G., (2006), Banking spreads in Latin America, Working Paper No. 06/44, IMF.

[42] As of December 2006, the delinquency rate of credit to the private sector was 2.4 percent in Mexico, 2 percent in Colombia, 1.9 percent in the U.S., 1.6 percent in Peru, 0.8 percent in Chile, 0.6 percent in Spain and 0.4 percent in Canada. Furthermore, in 2006 the creation of loan loss reserves as a proportion of assets was 0.9 percent in Mexico, 1.9 percent in Colombia, 0.8 percent in Peru, 0.3 percent in the U.S., 0.6 percent in Chile, 0.1 percent in Spain and 0.1 percent in Canada.

[43] According to a World Bank study, the costs incurred to complete a business contract in Mexico (expressed as a percentage of the debt) are 20 percent, while in Peru they are 34.7 percent, in Canada, 12 percent, in Chile, 10.4 percent, in Colombia, 18.6 percent, in Spain, 14.1 percent, and in the U.S., 7.5 percent. World Bank, (2006) Doing Business Database.

5.1.2.   Interest rate spread

The spread between lending and deposit interest rates varies considerably from one market to another due, among other factors, to differences in average credit terms, default rates, the guarantees involved, each market's competition conditions, and banks' capacity to vary their products.

Graph 32
Interest Rate Spread

a) Interest Rate Spread of Commercial Credit, TIIE and Average Cost of Funds
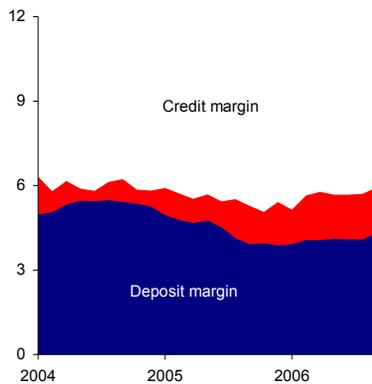
Percentage points

b) Interest Rate Spread[1/] of Mortgage Credit, TIIE and Average Cost of Funds
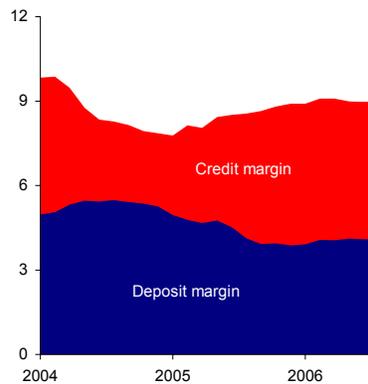
Percentage points

c) Interest Rate Spread[1/] of Credit Cards, TIIE and Average Cost of Funds

Percentage points
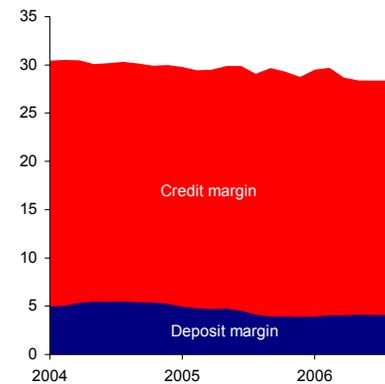
Figures at December 2006.
The credit margin is the difference between average lending interest rates and the TIIE.
The deposit margin is the difference between TIIE and commercial banks' average cost of funds.
1/ The lending interest rate does not include costs associated to acquiring loans, such as opening commissions and insurance, which are included in the Total Annual Cost (CAT).
Source: Banco de México and Infosel.

Graph 32 shows the interest rate spreads for commercial credit, mortgages, and credit cards in Mexico.[45] In the first of these markets, the average spread was 5.9 percentage points as of December 2006; in the second, it was 9.2; and in the market for credit cards, it was 28.6. Several bank credit products are becoming increasingly standardized; for instance, in commercial and mortgage credit, banks are focusing more on evaluating the risks associated with the assets used to guarantee these loans instead of on counterparty credit risks. This procedure facilitates risk measurement and therefore helps reduce interest rate margins. On the other hand, the evaluation of risks associated with consumer credit, which is normally granted without collateral, tends to be more complex, especially in the case of new customers. As a result, implicit risks in this portfolio are higher. Thus, the interest rate margin on commercial credit to firms is lower than the average interest rate margin on credit granted by commercial banks to

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[44] For instance, the premium and the base upon which deposit insurance fees are charged are higher in Mexico than in the other countries mentioned. Likewise, the deposits commercial banks are obliged to make at the central bank, measured as a percentage of bank assets, are also high in Mexico.

[45] The spread between lending and deposit interest rates can be broken down by credit and deposit margins. The former corresponds to the difference between the average interest rates charged by the bank for granting credit (lending rate) and the interest rate in the interbank money market (TIIE). The deposit margin is the difference between the TIIE and commercial banks' average cost of funds. The size of the differential is related to each bank's market power to obtain deposits, which is closely linked to the number of branches, among other factors.

the private sector as a whole. In December 2006, commercial bank revenues from credit to firms accounted for 29.8 percent of total income from credit granted to the private sector (vertical axis, Graph 33a). This result was obtained despite the fact that financing to firms accounts for 47.2 percent of total credit channeled to the private sector (horizontal axis).

Graph 33
Financing to the Private Sector

a) Balance and Income from Credit to Firms as a Proportion of Balance and Income from Credit to the Private Sector	b) Balance and Income from Peso Denominated Mortgage Credit as a Proportion of Balance and Income from Credit to the Private Sector	c) Balance and Income from Consumer Credit as a Proportion of Balance and Income from Credit to the Private Sector
Income percent (vertical axis) Balance percent (horizontal axis)	Income percent (vertical axis) Balance percent (horizontal axis)	Income percent (vertical axis) Balance percent (horizontal axis)
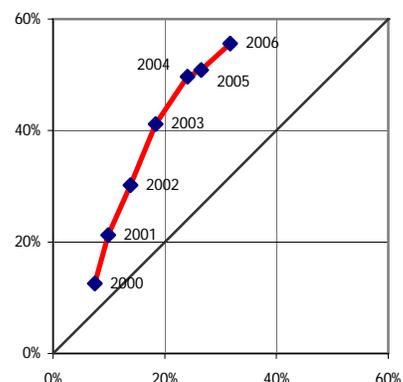
Figures at December 2006.
Source: Banco de México and CNBV.

Income from credit to firms has been declining faster as a proportion of total revenues than as a proportion of total credit to the private sector. This is due to greater competition in this market, among other factors. A reduction in the interest rate margin of peso denominated mortgage credit has also been observed recently, and this has been reflected in a significant decline in the relative importance of income from this activity despite the rise in the amount of credit granted (Graph 33b).

Finally, income from consumer credit has become more important as a proportion of commercial banks' total revenues. Thus, although in December 2006 consumer credit financing accounted for 56.4 percent of revenues derived from credit to the private sector, this type of credit accounted for just 32.3 percent of total bank financing to the private sector (Graph 33c).

5.1.3.   Income from trading

Trading income stems from the profits and losses generated by buying and selling securities and currencies as well as the revaluation of banks' positions in securities. In 2006, the six largest banks' income from trading rose 14.7 percent in real terms compared to its level in the previous year.

Trading returns tend to be highly volatile in Mexico due to the accounting standards for the registration of repo operations. This is particularly important in Mexico given the amount of securities commercial banks finance through these operations[46] and the significant participation of foreign bank subsidiaries in the commercial bank sector. The treatment of repo operations in accounting procedures varies from country to country. The differences among the treatment of these operations in Mexico and in countries where Mexican banks have their head offices mean that results are not comparable, and banks face different incentives when making their investment decisions.

In Mexico, securities financed through repo operations must be marked to market, and any changes in their value are registered in the statement of results.[47] In other countries, variations in the value of securities financed via repo operations are allowed to directly affect capital accounts without having to pass through result statements. Parent companies of Mexican banks publish their subsidiary financial statements according to current accounting standards in their own countries. Therefore, although the results these banks publish in Mexico are highly volatile, the volatility vanishes when the same operations are registered according to accounting standards in use in each parent bank´s country of origin.

The differences described above mean that some banks can maintain significant positions in repo-financed securities without changes in the value of these securities affecting the consolidated results of their parent companies. As a result, banks with head offices in countries which allow repo-financed securities to have a direct impact on capital accounts enjoy certain advantages, given the aversion investors tend to have to excessive fluctuations in result statements.

5.1.4. Income from fees and commissions

In recent years, fees and commissions have become relatively more important in commercial banks' total income (Graph 34a). In 2006, income from commissions charged by the six largest banks rose 14.9 percent in real terms compared to their level in 2005 (Graph 34b).

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[46] Liabilities from repo operations are not subject to IPAB contributions. For this reason, banks normally finance their securities positions through repo operations instead of using other types of liabilities.

[47] Holdings of securities can be registered as "securities for negotiation," "available for sale" or "held to maturity." Valuation of "securities for negotiation" is recognized in results statements, while "securities available for sale" and those "held to maturity" are recognized in capital accounts. Up until December 2006, securities financed by repo operations had to be registered as "securities for negotiation." However, as of January 2007, they can be registered as "securities for negotiation" or "securities available for sale" and, in both cases, value changes must be reflected in result statements.

Graph 34
Income from Fees and Commissions (Six Largest Banks)

a) Revenues from Net Fees and Commissions[1] as a Proportion of Total Assets
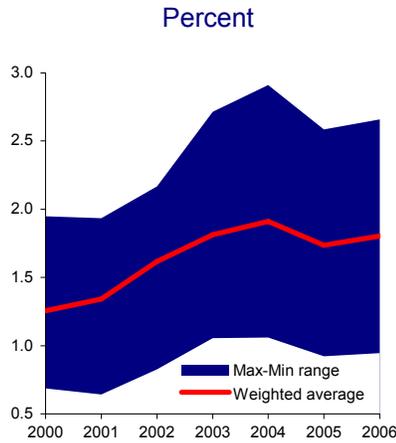
b) Income from Fees and Commissions Charged[1]
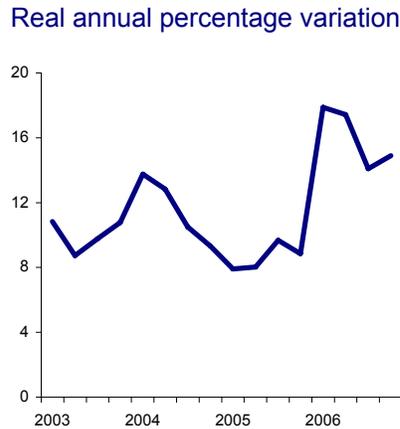
c) Composition of Income from Fees and Commissions Charged[2]

Percent

Real annual percentage variation

Percent
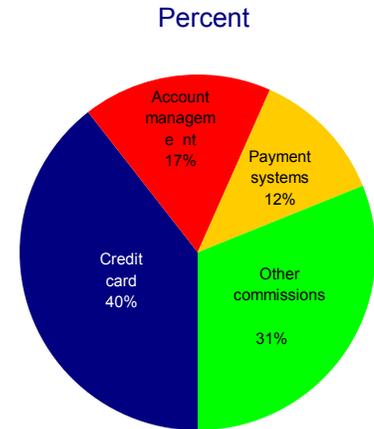
Figures at December 2006.
1/ Net commissions are the difference between charged and paid commissions. The average is weighted by the amount of assets.
2/ Payment system commission revenues include commissions for cashiers checks, certified checks, travelers checks, worker remittance transfers, fund transfers and electronic banking.
Credit card commission revenues derive from annual fees paid by cardholders and the Discount Interest Rate paid by businesses when cards are used.
Source: CNBV.

The above result responds to increases in the number of customers and the volume of banking operations which are subject to some kind of commission. The rise in the number of credit cards (up 39 percent) and affiliated businesses (up 42 percent) during the period was significant. Also of importance, the amount of credit card transactions carried out with affiliated businesses grew 48 percent, and the number of electronic transfers made via the Interbank Electronic Payment System (Sistema de Pagos Electrónicos Interbancarios, SPEI) rose 210 percent.[48]

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[48] Percentage increases in the number of cards, affiliated businesses, credit card transactions, and electronic transfers include all banks.

5.2. Solvency

Regulators measure a bank's solvency with the capital adequacy index (Índice de Capitalización, ICAP). As of December 2006, the average capital adequacy index for the six largest banks was 15.2 percent (Graph 35a).[49]A bank's solvency also depends on its capacity to generate profits and its index of loan loss reserves to non-performing loans. Hence, the six largest banks' operating profits measured as a proportion of equity rose from a weighted average of 7.6 percent (simple average of 9.8 percent) in 2000, to 36.5 percent (simple average of 36.4 percent) at the end of 2006 (Graph 35b). Loan loss reserves as a percentage of non-performing loans remained stable, moving from 176 percent in 2000 to 178 percent in December 2006 (Graph 35c).

Graph 35
Solvency Indicators (Six Largest Banks)

a) Capital Adequacy Index	b) Profit before Taxes as Percentage of Average Equity	c) Loan Loss Reserves to Non-Performing Loans
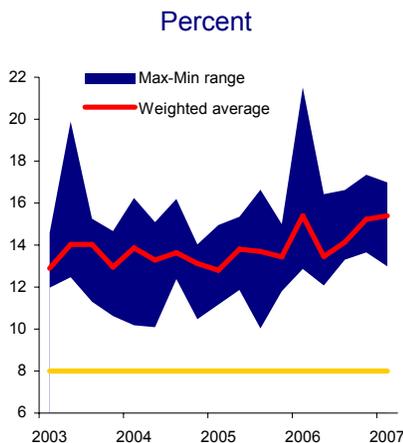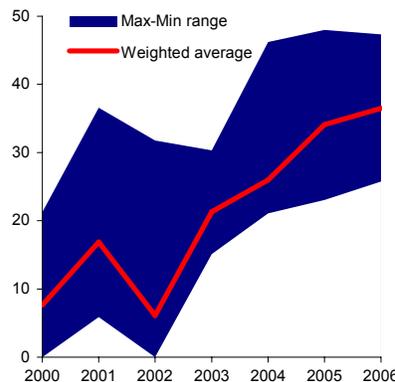
Percent

Figures at March 2007.
Average weighted by the amount of assets.
Source: CNBV.

Figures at December 2006.
Average weighted by the amount of assets.
Source: CNBV.
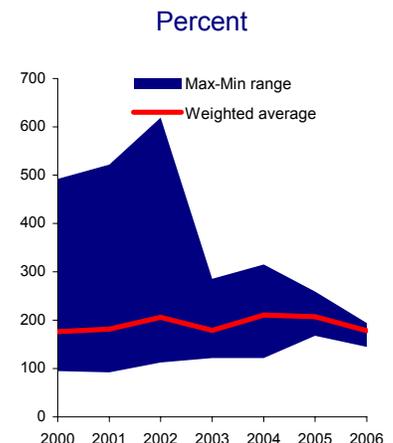
Figures at December 2006.
Source: CNBV.

5.2.1. Capital adequacy index (ICAP)

ICAP is the ratio of regulatory capital to market and credit risk weighted assets (Box 9). Regulatory capital is composed of Tier 1 and Tier 2 capital, the first of which accounted for 93 percent of regulatory capital as of December 2006 (Graph 36a).

A common practice among banks is to register asset and liability positions in their trading and banking books. In general, the trading book registers positions that can be negotiated at any moment in order to leverage market movements, while positions the bank intends to maintain until maturity are recorded in the "banking book."[50]

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[49] Average weighted value of each bank's assets.
[50] Financial information regulations establish that, as of January 2007, all derivatives operations, as well as liquid positions which are covered by a cross-hedging" derivative must be marked to market. This means a credit covered through a derivative operation must be valued at market price and any change in its value must be reflected in the capital accounts.

Unlike the guidelines issued by the Basel Committee,[51] which establish that capital requirements for market risk should only be calculated on positions registered in the trading book, these calculations in Mexico include positions recorded in both the trading and the banking book.[52] As a result, in most countries, the capital requirement corresponding to market risk weighted assets is normally not more than 10 percent of the total capital requirement,[53] while in Mexico this figure is significantly higher (Graph 36b). In order to estimate the capital requirement for market risk, capital adequacy regulation in Mexico was issued in 1996 adopting the building block approach issued by the Basel Committee (Box 9). Graph 36c shows risk weighted assets according to current capital adequacy regulation and market risk weighted assets estimated with Value at Risk (VaR) at a 97.5 percent confidence level.

Graph 36
Regulatory Capital and Credit and Market Risk Weighted Assets (Six Largest Banks)

a) Regulatory Capital

b) Market and Credit Risk-Weighted-Assets

c) Market Risk-Weighted-Assets and Market VaR

Billion 2002 pesos

Percent

Billion pesos
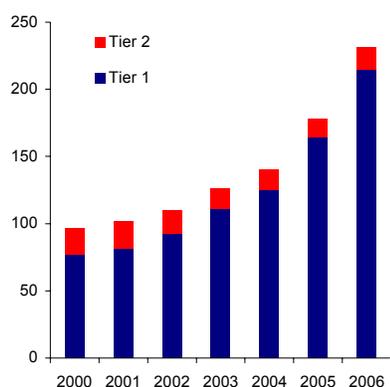
Figures at December 2006.
Source: Banco de México and CNBV.
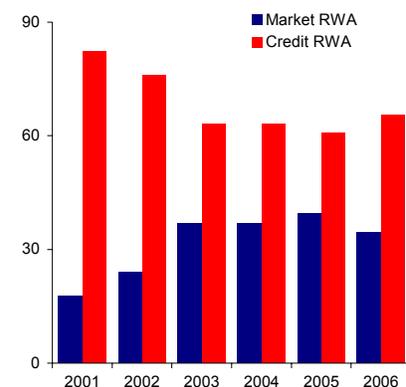
Figures at December 2006.
Source: Banco de México.
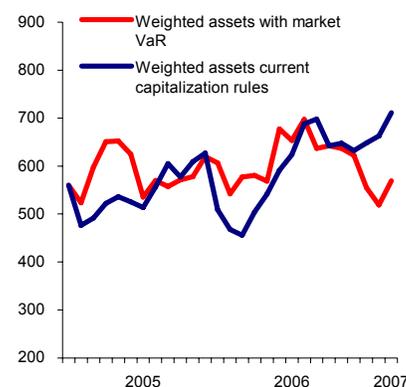
Figures at March 2007.
Source: Banco de México.

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[51]   Bank for International Settlements (BIS), (2005), Amendment to the Capital Accord to Incorporate Market Risks, Basel Committee on Banking Supervision.

[52]   Banking book market risk measurements are subject to certain technical difficulties due to the absence of secondary markets and, thereby, of prices. Thus, while it is easy to obtain a bond price from the trading book, it is not possible to determine the market price of a loan. This situation hampers estimation of the assets and liabilities included in this book. This, together with the assumption that commercial banks wish to maintian these positions until maturity, has meant that financial authorities in most countries do not impose capital requiements on the banking book's market risk. Nonetheless, increasingly active use of the banking book by a growing number of banks underscores the convenience of measuring and capitalizing its market risk.

[53]   National Bank of Belgium, (2003 and 2004), Financial Stability Review.

Box 9

Capital Adequacy Index

The Capital Adequacy Index (Indice de Capitalización, ICAP) is an indicator used to evaluate financial institutions resilience to the risks they are exposed to. According to the Regulations for Commercial Bank Capitalization Requirements (Reglas para los Requerimientos de Capitalización de las Instituciones de Banca Múltiple),[1] the ICAP should always be above 8 percent. The ICAP is calculated by dividing Regulatory Capital by the sum of Market Risk Weighted Assets (MRWA) and Credit Risk Weighted Assets (CRWA).

$$\text{Capital Adequacy Index} = \frac{\text{Regulatory Capital}}{\text{MRWA} + \text{CRWA}}$$

To calculate the MRWA, asset and liability positions must be separated in time bands according to interest rate, maturity and currency. Each time band has a different weight or capital coefficient. The net position between each band's assets and liabilities should be multiplied by the corresponding weight or coefficient. In this way each band's capital requirement can be determined, the sum of which, when divided by 0.08 gives the most important component of MRWA.[2]

In order to determine CRWA each asset is multiplied by the corresponding coefficient according to the abovementioned Regulations. For instance, federal government assets use a coefficient of 0; commercial banks' assets, 0.20 and credit to the private sector, 1. It is therefore possible to determine each asset's capital requirements, the sum of which, when divided by 0.08 gives CRWA.

Regulatory Capital is composed of Tier 1 and Tier 2.

Tier 1 Capital

Tier 1 is equal to Equity

+ Capital contributions pending formalization

+ Banking Capitalization Instruments which do not exceed limits established by the Regulations [3]

- Investment in subordinated debt instruments

- Investment in financial intermediaries stocks and shares

- Investment in non-financial firms which are not quoted on the Stock Exchange [4]

- Investments in Stock Market quoted shares, if the investment represents more than15 percent of the issuers capital

- Investment in related companies' shares

- Loan loss reserves pending creation or created and charged to accounts other than those of capital or results

- Financing obtained to purchase shares in the same institution, its holding company, other institutions belonging to the same financial group or its subsidiaries

- Credit granted or operations carried out in contravention to applicable legislation

- Intangible assets and items which imply deferred costs or expenses

- Income tax and Worker's Profit Sharing differed from fiscal losses and accumulated reserves which exceed the fiscal limit of 10 percent of Tier 1

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= **Tier 1 Capital**

Tier 2 Capital

Tier 2 is equal to Bank Capitalization Instruments which surpass the limit established in the Regulations for calculating Tier 1,

+ Non preferred subordinated debt that are not convertible into shares, in which the issuer can cancel interest payments and/or defer the principal

+ Other subordinated debt

+ General reserves for up to a total not exceeding 1.25 percent of Credit Risk Weighted Assets .

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= **Tier 2 Capital**

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[1] Capitalization Rules are issued by the Ministry of Finance (SHCP).
[2] MRWA calculations include other capital requirements which are not mentioned in this explanation. Furthermore, MRWA also include capital required for net currency, Udis (Unidades de Inversión) and share's portfolios.
[3] The issue of bank capitalization instruments must fulfill the characteristics specified by the Rules and their inclusion in Tier 1 Capital cannot exceed 15 percent.
[4] Excludes banks investments in companies providing complementary services to banks and real estate companies which administer their fixed assets.

5.2.2. The building block approach for calculating the capital adequacy index

The growing activity of commercial banks in derivatives markets during the last few years has exposed one of the most serious deficiencies of the building block approach. This method allows asset and liability risk positions to be offset if the instrument is the same, and to be completely eliminated if the amounts are equal. However, it has become a common practice to use similar but not identical operations to offset risks stemming from interest rate or exchange rate fluctuations. The building block approach does not always enable adequate

offsetting between positions of this type, which results in higher capital charges for banks.[54] As a result, in January and September 2006, several amendments to the capital adequacy rules issued by the Ministry of Finance (SHCP) came into force, increasing the possibilities of offsetting asset and liability positions when the spread between maturities is not more than seven days and operations refer to the same underlying asset. Amendments to these rules have also allowed futures and forwards to be completely offset, together with their corresponding underlying assets, among other procedures.

Table 7
Capital Weights for Peso Denominated Nominal Interest Rates
Percent

Term to maturity	Previous	New
From 1 to 7 days	0.12	0.12
From 8 to 31 days	0.56	0.25
From 32 to 92 days	1.75	0.62
From 93 to 184 days	3.96	1.12
From 185 to 366 days	4.53	2.22
From 367 to 731 days	6.30	3.87
From 732 to 1,096 days	7.35	5.03
From 1,097 to 1,461 days	7.90	6.59
From 1,462 to 1,827 days	8.20	9.53
From 1,828 to 2,557 days	8.45	12.47
From 2,558 to 3,653 days	8.60	16.49
From 3,654 to 5,479 days	8.70	19.67
From 5,480 to 7,305 days	8.70	22.85
Over 7,306 days	8.70	26.03

Previous: Weights used in Mexico up until December 2005.
New: Weights which came into force in January 2006.
Source: Ministry of Finance (SHCP).

Changes made to capitalization rules allow assets with maturities of up to two years to be offset by demand deposits with a history of stable behavior and an interest rate insensitive to market interest rates. Capital weights were reviewed according to market risk (Table 7) in order to adapt them to changes observed in the volatility of risk factors, as well as introduce new coefficients for risks associated with interest rates at terms of over 10 years.[55] The reforms came into force in January 2006, and since their implementation they have been significant in explaining changes in the capitalization index of banks.

5.3. Risks

This section provides an analytic evaluation of risks associated with credit, market, liquidity, and contagion that could affect commercial banks. In order to measure credit and market risks, a VaR (Value at Risk) methodology was

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[54] For instance, MexDer contracts mature on the third Wednesday of each month, while interest rate swaps exchange flows every 28 days. As a result, banks using interest rate swaps and futures were not able to offset one with the other as this could lead to gaps of up to seven days in flows.

[55] In order to calculate the new capital coefficients for each band, a market VaR based on a 99 percent confidence level was estimated from data on daily risk factor behavior between 1998 and 2004. The objective of capital requirements is to absorb unexpected losses. Therefore, capital weights calculations should not only consider recent periods of volatility due to the fact that in doing so regulation would be excessively pro-cyclical.

employed,[56] while liquidity risk was calculated using the ratio of assets to liabilities, taking into account the liquidity of assets and the permanence of liabilities. The chapter also includes several stress exercises which test commercial banks' capacity to absorb sudden changes in certain financial variables. Finally, to analyze contagion risks, a simulation of the impact that one bank's bankruptcy might have on the rest is presented.

5.3.1.   Credit risk

To calculate credit VaR, a parametric default model called Capitalization and Credit Risk (Capitalización y Riesgo de Crédito, CyRCE)[57] was employed. The main inputs of the model are the probability of default of each credit, the structure of variances and co-variances of potential defaults, as well as the structure and level of loans making up the portfolio. Graph 37 shows the evolution of default probabilities for different types of credit from 2002 to 2006.

Graphs 38a and b illustrate probabilities of default for the portfolios of services, industry, durable goods purchases, and credit cards. The graphs show that the default probability of credit cards doubled during 2006. The increase responds partly to the strategy of several banks of lending to sectors of the population considered as high risk and for which no information exists in the public registry. In 2006, commercial banks issued around 8.7 million credit cards, 40 percent of which were granted to individuals with no credit history. As a consequence, banks have had to assume a growing amount of losses in their consumer portfolios, a situation reflected in an increase in write-offs as a proportion of the total portfolio (Graph 38c). The profitability of consumer credit allows banks to recognize these losses against reserves. Loss recognition has led to a decline in the coverage of non-performing loan portfolios, with a decrease in reserves from 208 percent in 2005 to 178 percent at the end of 2006. As for the commercial and mortgage portfolios, write-offs decreased as a percentage of the total portfolio during 2006.

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[56] VaR is a standard measure of risk, and its calculation requires the distribution of the portfolio's losses. For example, a one-year VaR with a confidence level of 99 percent of one hundred thousand pesos, means there is a 1 percent probability that losses will exceed one hundred thousand pesos during a one-year period.

[57] Márquez Diez-Canedo, Javier, (2005), A simplified credit risk model for supervisory purposes in emerging markets, No. 22, 328 – 360, Bank for International Settlements (BIS). In this model, the VaR formula is expressed as the average expected loss in the portfolio plus a multiple of the standard deviation of these losses. Risk analysts name the first component of VaR the expected loss, while the second is known as the unexpected loss. Another feature of the model is that the portfolio's concentration level is explicitly represented in the unexpected loss component of VaR, measured by the Herfindahl Hirschman Index (HHI). This has made it possible to evaluate how a portfolio's concentration contributes to its risk. In sum, the model enables determination of the relative contribution or importance in risk, of default probabilities and correlations, as well as the level of concentration.

Graph 37
Probabilities of Default by Type of Credit (Six Largest Banks)

a) Average Annual Probability of Default of Credit to Firms

Percent
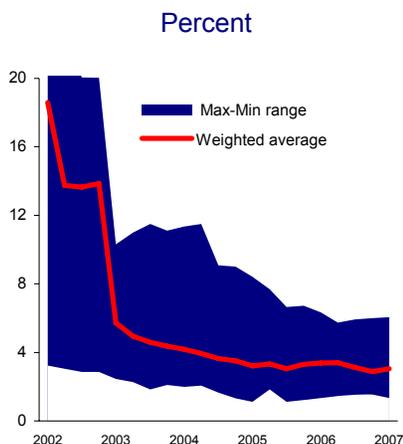
b) Average Annual Probability of Default of Consumer Credit

Percent
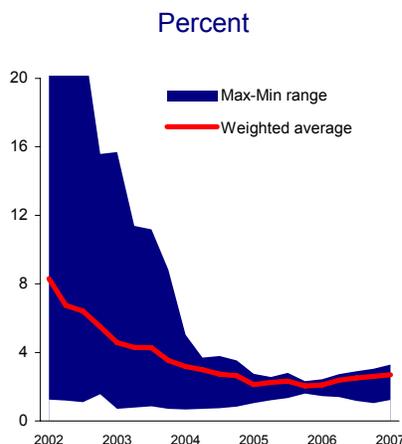
c) Average Annual Probability of Default of Mortgage Credit

Percent
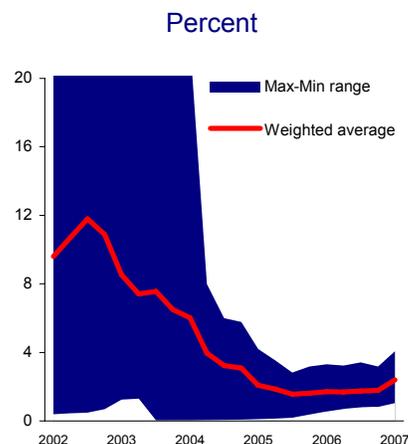
Figures at March 2007.
Source: Banco de México.

Graph 38
Probabilities of Default and Write-offs (Six Largest Banks)

a) Average Annual Probability of Default of Credit to the Services and Industrial Sectors
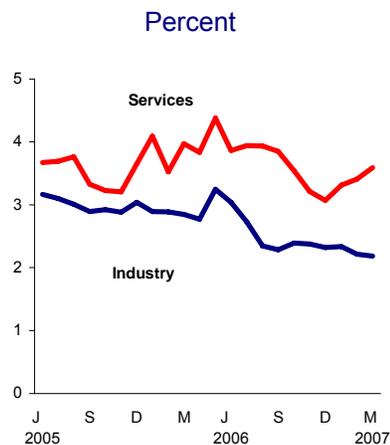
Percent

b) Average Annual Probability of Default of Credit Card and Durable Goods Consumer Credit
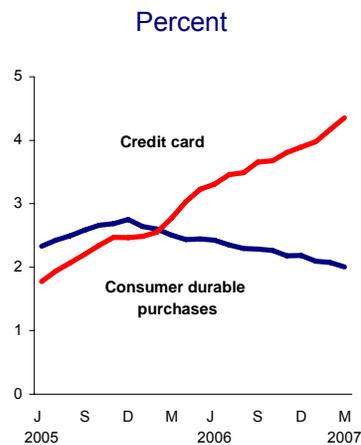
Percent

c) Write-offs as a Proportion of Total Credit [1]

Percent

Figures at March 2007.
Source: Banco de México.

Figures at March 2007.
Source: Banco de México.
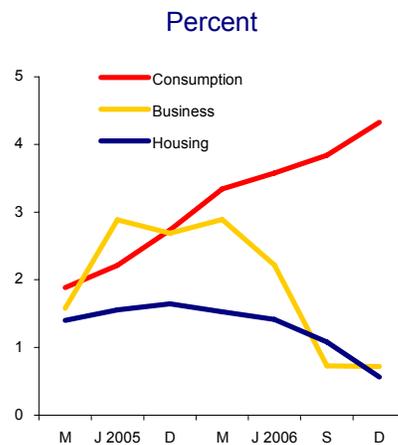
Figures at December 2006.
1/ Total credit consists of performing and non-performing loans.
Source: CNBV.

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Box 10

Estimation of Default Probabilities and Correlations

The most frequently used tools for calculating default probabilities are rating and credit scoring systems. Although such systems are undeniably useful, it is important to mention that the use of default probabilities, particularly those associated to rating systems, present several problems. The most important of these is that it practically forces segmentation of the credit portfolio according to ratings, which is not always desirable for risky segment identification purposes. For instance, the same rating is often given to debtors from different economic sectors, whose default probabilities depend on different risk factors or respond to the same risk factors in a different way. Thus, variations in the behavior of risk factors can lead to an erroneous evaluation of risk levels in the different rating components. Obviously, if a bank has a good system for rating its debtors and has carried out the basic tasks necessary to obtain default rates associated to each rating, then the system can contribute to default rate calculations.

It should be pointed out however, that there are other methods of evaluating default probabilities through "structural" and "reduced-form" models which attempt to estimate default probabilities by taking as primitives the stochastic behavior of the risk factors which determine them[1], but these require complex models and estimation procedures which are not always feasible due to information limitations. On the other hand, default probabilities can also be estimated with traditional statistical methods using data on observed default rates.

Regarding pair wise default correlations (i.e. between any two loans in the portfolio), although they can be calculated in the case of structural and reduced-form models, such correlations are implicit in risk factor co variation patterns. When historic data on loan defaults is available in different segments of the corresponding portfolio, it is possible to make calculations using statistical methods.

Default rates
Assuming that a portfolio is segmented according to a proper classification system (e.g. when the portfolio is segmented by ratings, type of credit, economic activity or geographical region), then the starting point for credit default probability and correlation estimations using statistical methods is historic information for debtors' default rates in each segment. The default rate is defined as the ratio of the number of defaulted loans during a given period relative to those that were performing at the beginning of the period. [2]

Statistical Estimation of Default Probabilities
It is assumed that the default probability and covariation pattern in a group of credits are constant over a certain time horizon, which is in turn divided into periods of equal length (e.g. an annual horizon divided into monthly periods). Estimates of default probabilities, obtained through the general method of moments, consist of taking a weighted moving average of the default rates, [3] corresponding to each period of the horizon being considered.

It is important to note that the aforementioned method is asymptotically equal to the maximum likelihood estimate of the default probability.

Statistical Estimation of Pair wise Default Correlations
Relevant literature describes two types of paired default correlations. The first considers the correlation between the defaults of any two debtors within the same segment, while the second refers to any two debtors in different segments. Estimations, obtained through the general method of moments, estimate the correlation implicit in default rate fluctuations observed in the horizon of reference.

Important Considerations
One fundamental element to be taken into consideration is the changeable nature of commercial banks' credit portfolios. In practice, changes in the different segments of a bank's portfolio have been observed, both in the number and the size of credits, regardless of the segmentation criteria used. Furthermore, such changes can be significant from one period to another.

It is currently accepted that default probabilities change over time, depending on the risk factors that affect them. Factors such as interest rates, the GDP of different economic sectors' and the economy in general, the exchange rate and the employment level can have a significant influence on default probabilities and correlations.

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[1] Cossin, D. and Hugues, P., (2001), Advanced Credit Risk Analysis: Financial Approaches and Mathematical Models to Assess, Price, and Manage Credit Risk, John Wiley & Sons.
[2] Default is when the debtor is past due for more than 90 days on any material credit obligation to the banking group. Basel Committee on Banking Supervision, (2004), "International Convergence of Capital Measurement and Capital Standards", 92, Bank of International Settlements.
[3] Weighting criteria is the number of credits in each period compared to total credits in the time horizon.

Graph 39a shows the VaR quotient for the six largest banks' regulatory capital.[58] Graph 39b illustrates the impact of a loss the size of credit VaR with a 97.5 percent confidence level on the capitalization index.[59] As can be seen, none of the six largest banks' ICAP would decline below 8 percent.[60]

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[58] The credit portfolio of the six largest banks accounts for 85 percent of total bank credit to the private sector.
[59] To obtain the ICAP resulting from a loss the size of credit VaR, the latter is subtracted from regulatory capital and assets.
[60] The behavior of credit VaR depends on the level of default probabilities and correlations. Box 10 contains an explanation of probability of default and correlation calculation procedures.

Graph 39
Credit Risk (Six Largest Banks)

a) Credit VaR at 97.5% Confidence as a Proportion of Regulatory Capital
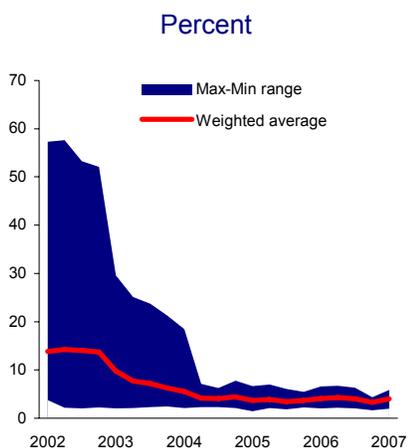
b) Capital Adequacy Ratio that Would Result from a Regulatory Capital Loss Equivalent to Credit VaR at 97.5% Confidence
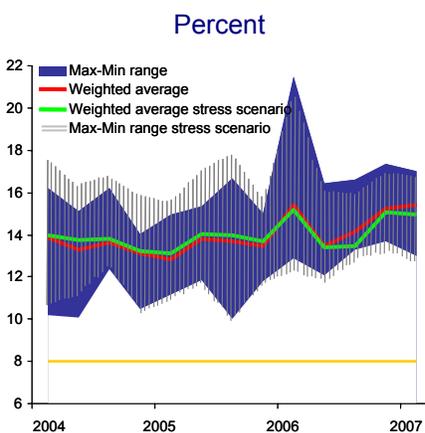
c) Annual Average Probability of Default of Performing Loan Portfolio

Percent

Percent

Percent
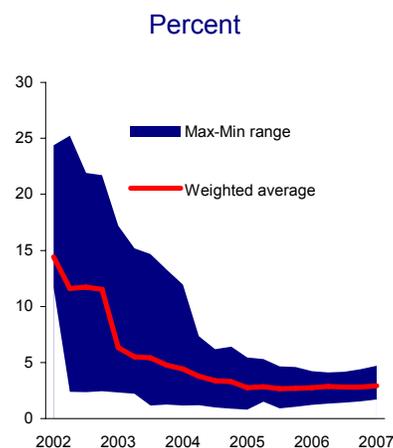
Figures at March 2007.
Source: Banco de México.

5.3.2.   Market risk

Market risk is the potential loss in the value of financial assets due to adverse movements in the risk factors or financial variables that determine their price.[61] Graph 40a shows trading book market VaR calculated from historic scenarios relative to regulatory capital.[62] There is certain vagueness in the interpretation of the results due to the fact that positions held in order to hedge banking book risks are also registered in the trading book. As a consequence, the trading book becomes over-sensitive to sudden interest rate movements. Graph 40b shows the impact of a loss the size of market VaR at the 97.5 confidence level on the capital adequacy index.

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[61] The most relevant risk factors are the volatilities of: interest rates at different terms, the Mexican stock exchange index and the peso's exchange rate vis-à-vis the U.S. dollar.

[62] The method consists of valuing the portfolio of market risk bearing assets in a group of historic scenarios defined by weekly variatioins in the value of risk factors; i.e., the market indicators that determine the price of the assets. The value of the portfolio in each historic scenario gives the distribution of profit and loss probabilities in a 28-day time horizon. VaR is the percentile corresponding to the chosen 97.5 percent confidence level on the side of distribution losses. Historic scenarios are constructed with weekly information on risk factors from January 1994 to December 2006.

Graph 40
Trading Book Market Risk (Six Largest Banks)
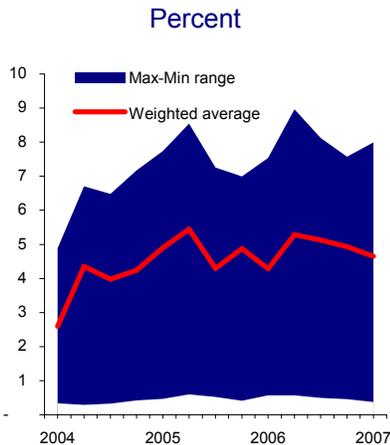
a) Market VaR at 97.5% Confidence as a Proportion of Regulatory Capital	b) Capital Adequacy Ratio that Would Result from a Regulatory Capital Loss equivalent to Market VaR at 97.5% Confidence	c) Composition of Value in Market Risk
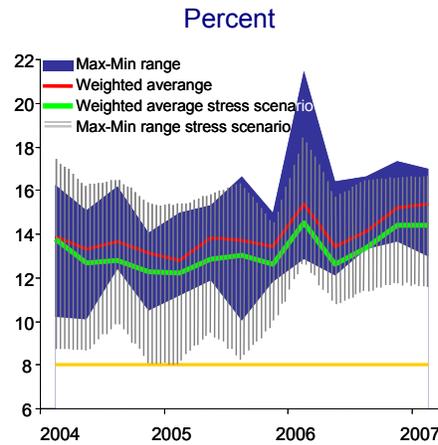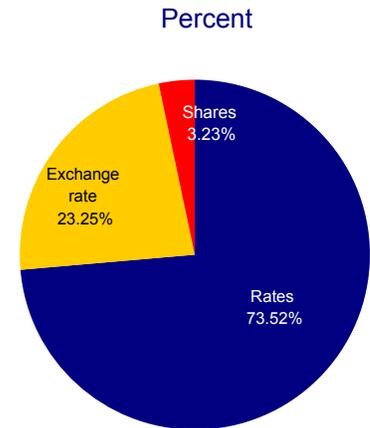
Figures at March 2007.
Source: Banco de México.

A frequently used measure of sensitivity is the "Dollar Value of one basis point" (DV01).[63] DV01 is defined as the variation in the price of a financial instrument resulting from a one basis point change in interest rates. Graph 41a shows trading book DV01 for Mexico's six largest banks. As can be seen, the average sensitivity of these banks' trading books to interest rate changes increased throughout 2006.

Graph 41b shows the adjusted duration behavior[64] of securities portfolios for the same six banks, while Graph 41c illustrates the convexity of these portfolios (Box 11). As shown, in March 2006, banks' appetite for convexity returned to its downward path in response to prevailing uncertainty surrounding the future behavior of interest rates.[65]

5.3.3.   Credit and market stress analysis

The main limitation of VaR as a universal measure of a portfolio's risk, rests on the fact that results increasingly depend on historic information used to calibrate the models. As a result, VaR cannot be considered an accurate measure of risks during crisis conditions. Stress tests are used in an attempt to correct this deficiency. The methodology consists of calculating a portfolio's potential losses in an adverse scenario which significantly differs from what is considered normal. The stress scenario is defined by changes in the level of risk factors. From this point of view, the stress test is an important complement to risk analysis as it enables calculation of the value a portfolio can lose when subject to adverse

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[63]   Known as DV01 due to its initials and the fact that it originally referred to the value in US dollars of one basis point.
[64]   Adjusted duration is duration divided by one plus the rate of yield. It measures the percentage change in the market value of debt after an infinitesimal variation in its rate of yield.
[65]   The higher the convexity of a securities portfolio, the lower the losses in its value after interest rate increases and the higher the gains when interest rates fall (See Box 11).

market conditions which deviate considerably from those normally observed (Box 12).

Graph 41
Losses and Gains from Interest Rate Variations (Six Largest Banks)

a) Change in the Trading Book Value for a One Basis Point Increase in Interest Rates (DV01)

b) Trading Book Adjusted Duration

c) Trading Book Convexity

Million pesos
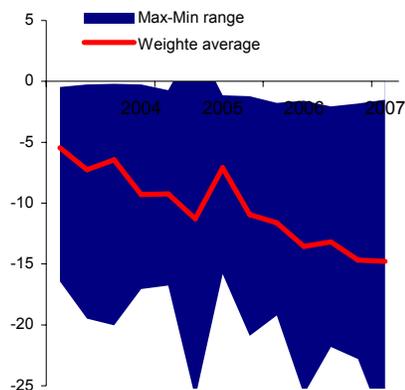
Percentage change in the portfolio value for every 100 basis points
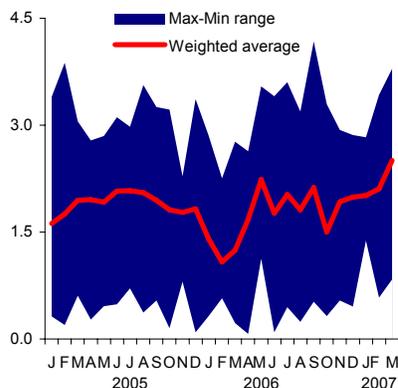
Convexity indicator
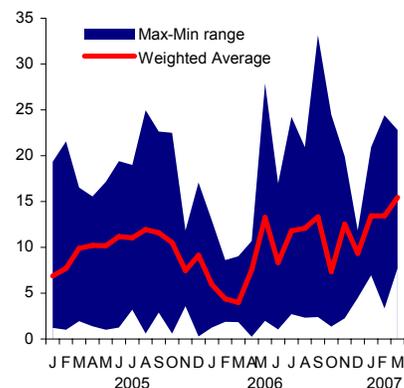
Figures at March 2007.
Source: Banco de México.

5.3.4. Stress test with historic values

The results shown below are from an exercise which comes under the category of extreme historic scenarios. One of the most severe crises suffered by the Mexican financial system was that which took place in December 1994. In order to specify a scenario that emulates events regarding credit risk during this critical period, it was assumed that current performing credit portfolios were exposed to an increase in their default probabilities and correlations similar to those observed after December 1994. As for market risk, movements in factors that affected risk-bearing assets during the period were reproduced. The most important of these factors are interest rates, the exchange rate and the stock market index.

Box 11

Interest Rate Sensitivity: Duration and Convexity

Introduction

The interest rate is the main risk factor affecting bond prices. Therefore, the sensitivity of a bond portfolio to interest rate changes has significant risk management implications. As is well know, there is an inverse relationship between bond prices and interest rates.

Duration

In principle, the higher a bond's term, the higher its sensitivity to interest rate variations. However, sensitivity also depends on the distribution of flows generated by a bond during its term to maturity. For instance, a zero coupon bond pays both interest and principal at maturity, while a bond with the same maturity but which pays coupons at regular periods also generates cash flows during its term to maturity and not only at maturity. As a result, it is not appropriate to use the maturity of a bond as an indicator of interest rate sensitivity.

Duration is a measure which includes the pattern of a bond's cash flows. This concept can be interpreted as a weighted average of the times at which a bond's future cash flows will be received. The weights reflect the relative importance of each payment compared to the bond's total value [1]. Nevertheless, duration calculates the change in a bond's price after interest rate movements via a linear relationship.

Convexity

The duration measure of bond price sensitivity is only accurate for very small variations of interest rates and leads to calculation errors regarding the sensitivity of a bond's price to large interest rate variations. [2] This is because the relation between the price of a bond and interest rates is a convex curve, as shown in the opposite graph. Convexity is a measure of the curvature of the relationship between bond prices and interest rates and can be used to make a correction of the duration measure which reduces the error in the price calculation for larger variations in interest rates.

Duration and Convexity
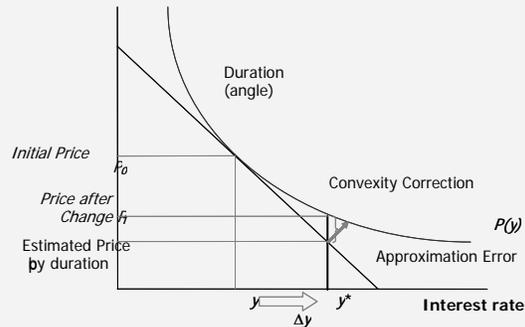
The fact that convexity is not a linear measure means it better approaches the curvature of a bond's price function.

Consequences

Given the asymmetry of bond prices to interest rates, the greater the convexity, the higher the gains when interest rates decline and the lower the losses when interest rates rise. When interest rate volatility is high, investors are willing to pay more for a bond with greater convexity. The aforementioned obeys the fact that a bond with higher convexity will offer greater yields when interest rates fall than a bond with less convexity yet with the same duration.

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[1] The price of a bond is calculated as the current net value of the flows it generates during its term to maturity.
[2] Bodie, Z., Kane, A. and Marcus, A., (2002), Investments, 5th Edition, Chapter 16.

Regarding market risk (Graph 42a), the institutions most affected were those with long-term positions in assets sensitive to interest-rate increases and short-term positions in U.S. dollars. Although most intermediaries generally hold such positions, not all of them are so vulnerable to interest-rate rises and exchange-rate depreciation. Therefore, the proposed stress scenario does not exercise the same impact on all financial intermediaries, and some of them could actually benefit from it. For example, the exercises clearly showed that there are institutions today which would suffer more under a scenario like the Russian crisis of 1998 than in an event similar to the Mexican crisis of 1994, although the latter would be much more damaging for the system as a whole.

Unlike market risk, where the behavior of risk factors (interest rates and exchange rate) lead to losses or gains the size of which can increase or decrease over time, in credit risk, losses occur after default. Another characteristic is that severe and lengthy crises are required in order for imbalances to be reflected in the credit portfolio. Finally, there is a lag between the moment when sudden movements in risk factors occur and the time when defaults appear. Graph 42b shows the accumulated loss that would appear over time in the credit portfolio measured as a proportion of regulatory capital.

Graph 42c shows that, if a scenario similar to that which occurred at the end of December 1994 were to be repeated, the average default probability for the system would reach its highest level 12 months after the start of the crisis. This probability would then decline over the next year and a half and then recover to values similar to those observed before the crisis. As for VaR, it would initially grow rapidly until it reached its first peak approximately six months after the start of the stress period, then decrease until the end of the period.

Graph 42
Stress Analysis (Six Largest Banks)

a) Losses Associated to the Market Stress Test as a Proportion of Regulatory Capital	b) Expected Accumulated Loss Associated to the Credit Stress Test as a Proportion of Regulatory Capital	c) Evolution of Credit VaR and Probability of Default in the Credit Stress Test
Percent	Percent (vertical axis) Number of months (horizontal axis)	VaR in billion pesos Probability in percent
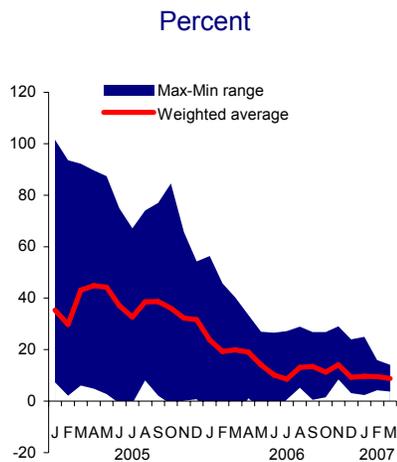
Figures at March 2007.
Source: Banco de México.
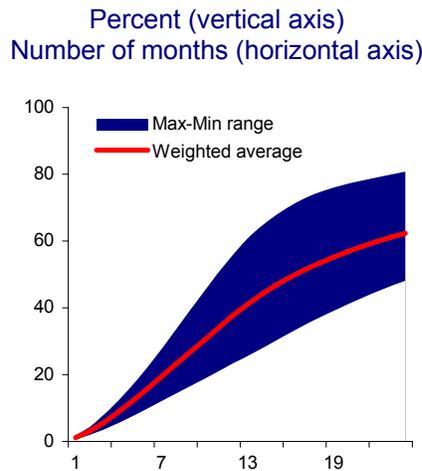
Assumes a non-performing loan recovery rate equal to zero.
Source: Banco de México.
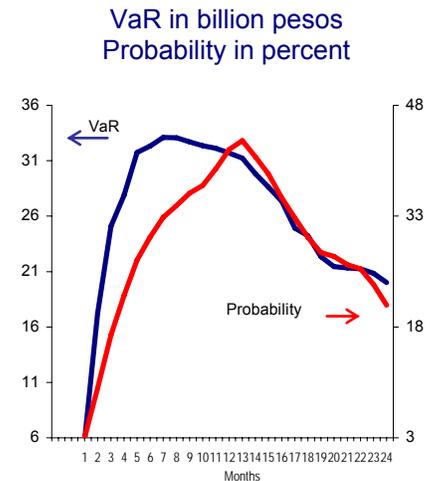
Source: Banco de México.

Box 12

Stress scenario construction

The main difficulties in specifying a stress scenario for evaluating the stability of the financial system are:

- that proposed risk factor values used to define the scenario are congruent with each other.

- that it is "believable", i.e. it is a scenario which the authorities perceive as plausible.

- that it causes higher than normal losses (as measured by VaR) for most market participants.

The vulnerability of a market participant to a particular scenario (whether it be stress or not), depends on its portfolio. As a result, a scenario that is catastrophic for one bank could be neutral or even beneficial for another. Thus, in any proposed scenario there will always be participants who lose, those who gain and those who are unaffected. In order to design a stress scenario for the financial system it is important to identify one which, besides exhibiting risk factors that are credible, results in generalized losses throughout the system. In practice, there are basically four commonly used approaches for stress scenario specification:

- Extreme stylized scenarios: considers extreme changes in only one of several risk factors, such as: interest rates, exchange rate and share prices.

- Extreme historic scenarios: reproduces changes of values of the risk factors as they occurred in historic crisis situations.

- Extreme hypothetical scenarios: defines assumptions on the values that risk factors could reach in the event of a totally unexpected situation for which there is no previous data.

- Scenarios obtained via "reverse engineering": these depend on the composition of a bank's portfolio and are determined by quantifying movements in risk factors that result in the greatest losses in the portfolio's value. It takes its name from the aforementioned due to the fact that instead of being based on risk factors it refers to portfolio composition and infers the changes in the risk factors which have the greatest repercussions.

The first methodology is the simplest and has the disadvantage that it considers extreme movements in only one risk factor at a time, disregarding the simultaneous change which normally occurs in the other risk factors that also affect the value of the portfolio [1]. This type of analysis is most useful to identify particular vulnerabilities in certain segments of bank portfolios and for reverse engineering. The second method allows a comparison of the financial system's current situation with what would occur if a critical scenario were to be repeated, with the advantage that it is a reference with which the community can relate to after having suffered its consequences. The main objection to the historic scenario approach has to do with whether history will actually be repeated. Meanwhile, the hypothetical method is the most complicated to implement due to the fact that it is an imaginary exercise that is difficult to construct in generally accepted terms, i.e. regarding the type of economic, financial or political events that could generate a disturbance of the type imagined and the size of distortions that these would cause in specific values of the risk factors proposed in the occurring event [2].

Although the reverse engineering technique is useful for carrying out stress tests for particular participants, due to the high dependence of the scenario's impact on portfolio composition, the identification of a scenario that would be especially negative for one intermediary does not necessarily mean it will have the same effect on others. Another drawback to this methodology is that there is no guarantee risk factors will maintain a reasonable relationship between them. Finally, the occurrence of one scenario necessarily excludes the occurrence of others and, thereby, the idea of imagining the most harmful scenario for each intermediary and adding the results leads to an approach which overestimates impact. As a consequence, this technique has only limited value when attempting to stress the financial system as a whole[3].

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[1] This is the approach mostly employed in the World Bank and IMF's Financial System Assessment Program (FSAP).

[2] The greatest successes in "generating" this type of scenario have been achieved using the Monte Carlo simulation, randomly recovering the generated scenarios that cause the largest losses in the financial system.

[3] A detailed description of the methodology used can be found in: Márquez, J. and López-Gallo, F., Mayo 2006, *"Un modelo de análisis del riesgo de crédito y su aplicación para realizar una prueba de estrés del Sistema Financiero Mexicano"*, Estabilidad Financiera, No. 10, Banco de España.

5.3.5.   Liquidity Risk

Liquidity risk is defined as the likelihood of an institution not meeting its obligations or having to incur excessive costs to fulfill them. Such costs could stem from the need to sell assets at penalized prices or to take loans at higher rates than those currently prevailing in the market.[66]

Graph 43 illustrates the structure of commercial banks' balances according to the level of liquidity measured using the methodology described in Box 13. The scheme shows that in 2006, on average, liquid assets were sufficient to cover the least stable liabilities.

Graph 43
Structure of Commercial Banks' Balance

a) Assets   b) Liabilities

Percent   Percent
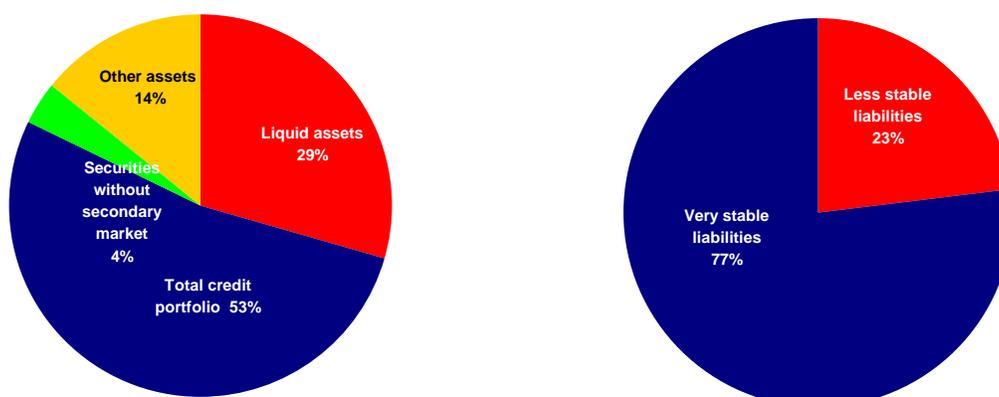
Monthly average 2006.
Source: Banco de México.

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[66] Liquidity risk arises from spreads between asset maturities and liabilities. Such risk is inherent in the banking business as banks collect short-term resources and transform them into medium and long-term loans. Proper management of such risk is essential given that if there is a lack of liquidity, institutions are obligated to incur the costs described, which puts their solvency at risk. As a result, a bank's liquidity should be analyzed under prevailing conditions as well as adverse scenarios.

Box 13

Asset and liability classification for liquidity and stability analysis

To carry out the liquidity analysis described in this section, assets and liabilities susceptible to becoming liquid were classified according to their maturities. The aforementioned is due to the fact that there are items in the balance for which the level of liquidity cannot be associated to contract maturity.

Classification of Banks' Assets and Liabilities

Item	Term
Asset	
Cash and deposits	Liquid asset
Securities	
Secondary market	Liquid asset
Without secondary market	According to maturity
Credit portfolio	n.g.
IPAB portfolio	According to maturity
Net repo and derivatives positions	According to maturity
Other assets	According to maturity
Liabilities	
Deposits	
Demand deposits	Stability analysis
Term deposits	Stability analysis
Interbank	According to maturity
Loans from Banco de México	According to maturity
Net repo and derivatives positions	According to maturity
Other liabilities	According to maturity

In the case of assets, there are items such as securities, which despite their long-term contractual maturities are still highly liquid and can be negotiated easily in the secondary market without exaggerated discounts. For such reason, all securities for which there is a secondary market are classified as liquid, despite their maturities, while those without a secondary market are classified according to their maturity.

With the exception of public deposits, all liabilities are classified by maturity. Public deposits[1] were classified according to their stability based on a statistical analysis of the historic behavior of the items mentioned for each bank during the period from January 1997 to December 2006. Such analysis identifies which proportion of each bank's public deposits are stable ("stable deposit base") and which are not. The stability of demand deposits varies from one bank to another. Thus, the stable deposit base of banks whose business focus is retail is higher than those who finance their operations with larger deposits.

Deposits in the Banking System
(Billion pesos)
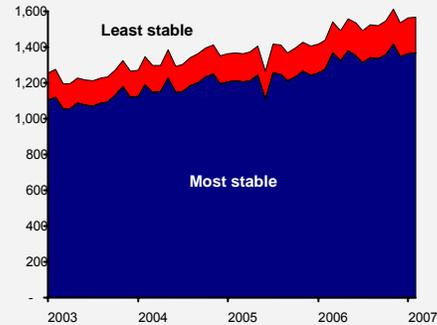
Figures at March 2007.

Maturity bands and ratio of assets to liabilities
Based on the above, the least stable liabilities were considered to have been withdrawn uniformly during the following month and securities with secondary market are considered as assets available at one day.

Once balance items were classified, all assets and liabilities were grouped in bands according to liquidity and maturity. The two most relevant intervals for liquidity risk are bands 0 to 8 days and 0 to 30 days, the latter being the most commonly mentioned in the literature. The indicator used for analysis purposes was the ratio of assets to liabilities (A/L) in each maturity band. If a bank has mismatches of over 100 percent it indicates that it can meet all its obligations within the specified time range.

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[1] Includes demand deposits (which maturity is at one-day, but in practice are highly stable, continuously renewing) and term deposits maturities (that show similar behavior although their maturities are stepped).

Commercial banks and financial authorities often use the asset/liability ratio as an indicator for liquidity at different maturities. Graph 44a shows that the average asset/liability ratio was over 100 percent for 8 and 30-day maturities. It also confirms that this ratio has improved in recent years. A value of over 100 percent in the quotient for the commercial bank sector as a whole means that a bank facing adverse liquidity could obtain resources in the interbank market if its counterparties judge it to be solvent or able to guarantee loan payment.[67]

_____

[67] A solvent institution with liquidity problems also has access to the central bank's liquidity if it has sufficient collateral.

Graph 44
Liquidity Indicators (Six Largest Banks)

a) Assets as a Proportion of Liabilities (A/L) for Different Maturities

b) Assets as a Proportion of Liabilities with Maturities over the Following 30 Days under a Normal Scenario

c) Assets as a Proportion of Liabilities with Maturities over the Following 30 Days under a Stress Scenario

Quarterly moving average of the weighted average. Percent

Quarterly moving average. Percent

Quarterly moving average. Percent
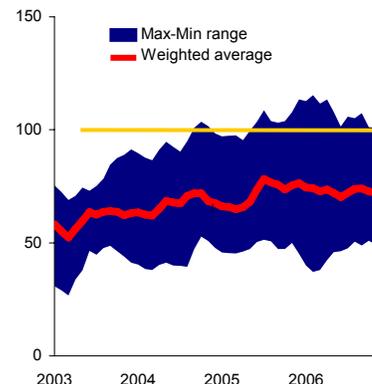
Figures as of March 2007.
Source: Banco de México.

If the analysis is separated by type of currency, the asset/liability ratio for maturities under 30 days for foreign currencies was four times higher than for the Mexican peso. The result can partly be explained by Banco de México's regulations regarding commercial banks' liquidity in foreign currency.[68]

A study evaluating liquidity risk should take both normal market conditions and unfavorable scenarios into account. In order to construct this scenario under stress conditions, it was assumed that an institution with problems would face the withdrawal of all its deposits over 400 thousand Udis during a one-month period.[69] It is obvious that such a situation would imply extremely adverse conditions for the bank in question. Nevertheless, in such an extreme scenario, the banking system would be able to pay around 75 percent of its obligations without having to obtain additional resources. Furthermore, the system's six largest banks' asset/liability ratios have recorded an upward trend during the last two years (Graph 44c). The following analysis does not consider a scenario of generalized crisis in which the value of bank assets could severely deteriorate.

5.3.6.   Risk of contagion

Contagion risk is the likelihood that problems affecting one bank will be transmitted to others. Such risk can materialize when the failure of one bank to meet its obligations has a direct impact on other banks (direct contagion).

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[68] Banco de México's regulations on foreign currency liquidity establish that commercial banks should maintain liquid assets in foreign currency invested abroad, in the amount of the difference between their liabilities and assets with maturities of less than 60 days.

[69] This amount was used in accordance with IPAB deposit insurance. The main difference between both scenarios is the behavior of depositors. In the stress scenario high withdrawals are considered, while in the normal scenario depositors' behavior is assumed to be similar to that observed during the last nine years. Of note, the relative stability of deposits in recent years could have been a response to deposit insurance covering total bank liabilities. This insurance was gradually reduced after January 2003.

Likewise, worsening of a particular institution's financial situation might have an effect on other institutions (indirect contagion), for instance, when the market perceives that direct contagion could occur or that other institutions are in a financial situation similar to the bank experiencing problems. It is important for financial authorities to limit the risk of contagion among banks at all times, due to the negative implications a simultaneous default of several credit institutions would have for the economy. For this reason there are regulations limiting the size of interbank positions.[70]

The following section shows the result of an exercise estimating the size of direct contagion risk in the interbank market. First, the impact the default of each bank would have on the capital adequacy index (ICAP) of the rest of the credit institutions was assessed. In order to evaluate the repercussions of such an event, each bank's debt with other institutions (risk exposure, in the form of interbank loans, deposits, securities, and derivative contract operations) was considered. It was also assumed that a bank in trouble would exercise the total credit line offered by the remaining institutions[71] and that it would eventually default on its total obligations from foreign exchange operations.[72]

When the default of one bank led to another's insolvency, the effect both banks' defaults had on the remaining institutions was calculated (second-round effects). This exercise was repeated until new cases of insolvency ceased to appear, taking several rounds. Any bank that does not meet its obligations can generate a chain of contagion. Banks' risk positions and the amount of debt they owe each other varies considerably from one day to the next (Graph 45a). Throughout 2005 and 2006, the most significant risk positions were associated with foreign exchange operations, which, on average, represented 40 percent of the total amount subject to risk (Graph 45b).

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[70] The maximum limit for interbank financing is equal to one times Tier 1 capital of the credit institution. The Nacional Comisión on Bank and Securities (Comisión Nacional Bancaria y de Valores, CNBV) "Circular Unica de Bancos." This limit is relatively high and responds to the importance of interbank credit in the liquidity of foreign exchange, securities, and derivatives markets. The interbank market also enables banks with temporary liquidity requirements to obtain resources from banks with excess liquidity and eases payment flows between different economic agents.

[71] Banks authorize bilateral credit lines for clearing and settlement in the SICAM. The SICAM is operated by Banco de México and provides settlement services for document clearing houses and interbank operations – among which it is important to mention checks, electronic fund transfers, and direct debits sent by CECOBAN to Banco de México on a daily basis. SICAM is a differed net settlement system that affects banks' current accounts in Banco de México.

[72] This is the most conservative assumption for measuring counterparty settlement risk in foreign exchange operations. It implies that a bank pays out the currency it sold to its counterparty but does not receive the currency it bought in foreign exchange operations settled on the day of the counterparty's payment default; i.e., they do not foresee the credit event. This default risk in foreign exchange positions is known as "Herstatt Risk." It is named after the German Herstatt bank, which was closed by German authorities on June 26, 1974, the date on which the bank stopped settling its U.S. dollar operations in the New York market, causing its counterparties, which had already honored their part of the deal earlier in German marcs, substantial losses.

Graph 45
Interbank Risk Positions

a) Daily Value of Interbank Risk Positions

b) Composition of Interbank Risk Positions[1]

Billion pesos

Percent
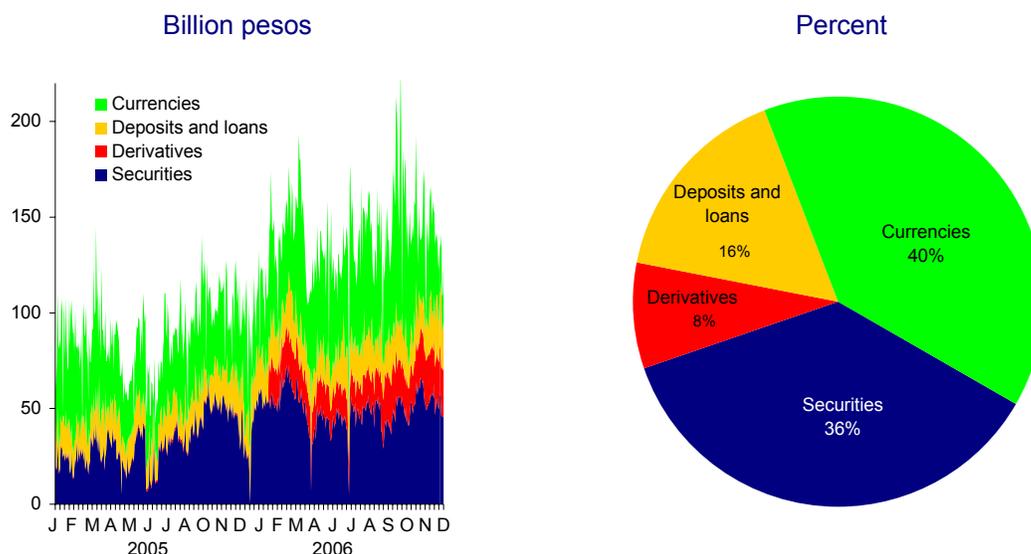
1/ Daily average 2005 and 2006.
Source: Banco de México.

The exercise, the results of which are shown below, assumed that there is a critical ICAP level below which all banks would suspend payment of their obligations. Thus, default takes place when a bank incurs in losses that reduce its ICAP below 4 percent.[73] The exercise also assumes that one counterparty's loss resulting from another bank's default will equal 100 percent of its risk position.[74] The exercise consisted of determining the worst possible chain of contagion for each day of the period under consideration. To this end, a matrix was constructed that included all interbank bilateral risk positions, and the chain of contagion that would be generated if each bank did not meet its obligations was determined.[75] The chain of contagion that had the greatest impact on the financial system was then chosen from all those considered. The impact was measured using the total value of assets of those banks with an ICAP below 4 percent.[76] Based on the aforementioned methodology, there was a chain of contagion on most days of the chosen time horizon (Graph 46a). Nonetheless, the assets of banks with an ICAP falling below 4 percent would account for more than 3 percent of the financial system's total assets on only two days of the 504 analyzed (Graph 46b).

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[73] This level was chosen in line with the Credit Institutions Law , which states that a bank's licence should be revoked when its ICAP falls below 4 percent.

[74] Such loss is known as "loss given default."

[75] The exercise implicitly considered the same default probability for all banks in the system.

[76] The percentage of assets in the system belonging to banks whose ICAP would be below 4 percent excludes the value of assets from the bank which started the contagion.

Graph 46
Main Results of the Contagion Exercise

a) Capital Adequacy Index that would Result after the Outbreak of the Worst Chain of Contagion on Every Day

b) Assets of Banks whose Capital would Fall below 4 percent after the Outbreak of the Worst Contagion on Every Day

Number of banks

Percent of total bank assets
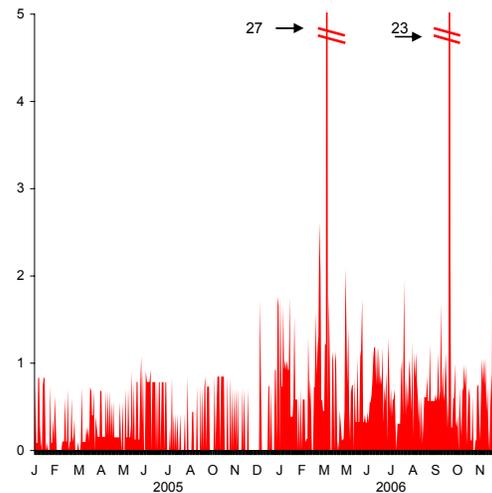
Assumptions: Loss given 100 percent default and an ICAP of 4 percent.
Source: Banco de México.

In sum, cases where contagion could come to represent a systemic problem or a threat to payment systems are possible but remote. Furthermore, as has been explained, the main interbank risk is that associated with payment of foreign exchange operations. If ways were found to reduce these main risks, the likelihood of contagion would be even smaller.[77] In the exercise, the number of banks that would fall below the regulatory minimum ICAP of 8 percent was significant in most chains of contagion. This result implies that banks in such a situation would have to be prepared to implement corrective actions in order to restore their capitalization level. The above results are similar to those obtained from simulation exercises carried out by other central banks. Such studies have concluded that there is little probability of the interbank market constituting a source of systemic risk, and that such risk would only appear if one of the largest banks defaulted on its payments.[78]

5.4. Competition

The following section deals with topics concerning competition in the banking sector. First, results from several studies regarding competition in the credit market are presented. This is followed by an analysis of the evolution of prices for different banking services and a study of the development of interbank commissions. The section ends by detailing the most important measures adopted

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[77] For example, foreign exchange operations made through the Continuous Linked Settlement (CLS) Bank are not exposed to such risk.

[78] Several examples of studies concerning contagion made by other central banks are: Blavarg, M. and Nimander, P. (2002), Interbank Exposures and Systemic Risk. Economic Review 2, 19-45, Sveriges Riskbank; Upper, C. and Worms, A. (2002), Estimating Bilateral Exposures in the German Interbank Market: Is there a Danger of Contagion?, European Economic Review 48, 827/849. Wells, S. (2002), UK Interbank Exposures: Systemic Risk Implications, Financial Stability Review, 175-182, Bank of England.

by Banco de México to encourage competition in the banking sector. Table 8 shows various concentration indicators for different bank credit activities. Concentration levels are usually the first analytical approach in the study of any industry's prevailing market structure. In general, it is assumed that the fewer participants a market has, the lower the competition. However, concentration levels do not represent an efficient measure of competition intensity due to the simple fact that in practice there are markets which are competitive despite a very high supply side concentration.

Table 8
Bank Credit Concentration Indicators

	Credit to the Private Sector	Consumer Credit	Mortgage Credit	Business Credit
Percentage participation: 2 largest	44	54	60	34
Percentage participation: 4 largest	69	79	81	61
HHI[1/]	1,516	1,891	2,808	1,235

Figures at December 2006.
1/ Herfindahl Hirschman concentration index.
Source: Banco de México with data from CNBV.

5.4.1.   Competition in bank credit

One methodology to estimate the intensity of an industry's competition is that developed by Panzar and Rosse.[79] This approach has been used in numerous studies of the banking industry in various countries including Mexico.[80] It is based on the response firms' inventories would have to changes in prices of inputs or production factors, such as financial and physical capital, as well as labor. The result is measured via the Panzar and Rosse competition indicator, known as the H indicator, which represents the sum of income elasticities compared to input price variations. The value of this indicator identifies the type of market structure which characterizes an industry (Box 14).

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[79] Panzar, J.C. and Rosse, J.N., (1987), Testing for Monopoly Equilibrium, Journal of Industrial Economics No.35, 443-456.

[80] Shaffer, S. (1982), A non-structural test for competition in financial markets, Bank Structure and Competition, Conference Proceedings. Chicago: Federal Reserve Bank of Chicago, 225–243; Nathan, A. and Neave, E. H. (1989), Competition and Contestability in Canada's financial System: Empirical Results, Canadian Journal of Economics, 22, 576-594; Molyneaux, P., et. al. (1996), Competition and Market Contestability in Japanese Commercial Banking, Journal of Economics and Business, Vol.48, Iss.1, 33-45; Belaisch, A. (2003), Do Brazilian Banks Compete?, IMF Working Paper, Western Hemisphere Department, WP/03/113.

Box 14

The Panzar and Rosse competition indicator (H)

Measurement of competition in the banking system is a challenge that poses a series of problems. Firstly, the relevant market's limits are diffuse. Banks offer many products and the competition each of these faces can be very different. Secondly, definition of the market has a geographical aspect; i.e., the intensity of competition is not homogeneous in terms of service units' location. Thirdly, deposits can be interpreted as an input to provide financing services or as a service.

Despite the problems mentioned above, relevant literature contains an infinitesimal number of attempts to measure competition in the banking sector. Panzar and Rosse (1987) developed an approach which forms part of the New Empirical Industrial Organization (NEIO). Such methodology does not explicitly use data on market concentration to determine the level of competition.

According to the NEIO, under certain assumptions, it is possible to combine endogenous and exogenous variables for firms' behavior in order to identify market equilibrium. The effect of changes in observable exogenous variables is studied through comparative statistical analysis and inferences are made regarding the way firms will behave under different market structures. Based on this idea, Panzar and Rosse developed a statistical test to identify the type of current market structure through comparing the sum of elesticities for a reduced income function to input prices. Such sum is named the H statistic. H is formally calculated according to the following formula:

$$H = \sum_{k=1}^{m} \frac{\partial R_i^*}{\partial w_{k_i}} \frac{w_{k_i}}{R_i^*}$$

where R_i^* is a bank's income function i and w_{k_i} is the price of the input k that the bank faces i.

Extreme market structures are useful for understanding the underlying intuition in the construction of the H indicator. If a perfectly competitive market structure is assumed, a proportional change in input prices would result in a change of equal proportion in average and marginal costs. However, the output level of each company would not vary (adjustments are made via companies exit from the market) and prices would rise by the same amount as marginal costs.

Thus, equilibrium income would increase in the same proportion as input prices and the H indicator would, therefore, equal one.

At the other extreme, in a monopolistic market structure an increase in input prices would be reflected, just as in a market characterized by perfect competition, in a rise in the marginal costs faced by the monopolist and, as a consequence, in higher prices. Nevertheless, given that a monopoly always operates in the elastic portion of its demand curve, the new income would be less than when costs were lower. As a result, an increase in different inputs' prices would translate into a drop in revenues and a negative H indicator.

The intermediate case is that which best reflects the banking industry's market structure given that financial services are normally assumed to be varied. These markets are characterized by Chamberlain type monopolistic competition[1], where each firm has certain market power and, as a result, the equilibrium price is higher than the marginal cost. Thus, an increase in input prices translates into a less than proportional rise in the income function, meaning the H indicator is positive, but less than one. The cases mentioned above make up the following table of possible estimation values for the H indicator:

estimated H	Implicit market structure
H ≤ 0	Monopoly or collusive cartel type agreement.
0 < H < 1	Chamberlain like monopolistic competition with free entrance.
H = 1	Perfect competition

---

[1] Chamberlain type monopolistic competition is representative of a market structure characterized by a combination of perfect and monopolistic competition i.e. firms are small and enter and exit freely. In the case of monopoly, each company has market power over its customers due to the fact that products are varied; in this way, each product has a negative demand curve. In such market structure competition can be intense, but it is made via product differentiation and not by struggling to offer the lowest prices.

Panzar and Rosse's methodology provides several advantages. In particular, it has a sound theoretical basis, required data is readily available, and results are easily interpreted. The test does, however, have some significant limitations, such as that derived from assuming the input market is competitive and the requirement that the industry being studied is in long-term equilibrium. Thus, the results shown below should not be considered as final. They represent only one factor among many in the study of banking sector competition.

The results obtained from the analysis of total bank revenues (H=0.52) and for those from credit (H=0.69) allow rejection of the hypothesis that the industry behaves like a monopoly.[81] A positive elasticity of less than one indicates that the price of services responds in the same direction as input price

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[81] To obtain H indicators, a panel type estimate was carried out at the individual bank level using annual figures for the period 2000-2005. Dependant variables used in the calculations were: commercial banks' total income, revenues from granting credit, income from consumer credit, mortgages, and credit to firms. Independent variables were: input prices (financing costs, physical and human capital) and a group of control variables, such as the scale of operations, each markets' risk, the mix of banking business, and the level of economic activity.

movements,[82] although in a lower proportion. This type of result suggests that the corresponding structure is one of monopolistic competition with free entry of new Chamberlain type suppliers. Such result coincides with those obtained in similar studies carried out in other countries to analyze the banking industry. The Chamberlain model gives an appropriate representation of the banking industry where competition is mostly based on product differentiation. Regarding evolution over time, the intensity of competition between banks has increased during the 2000-2005 period.

The study also showed that the intensity of competition is not homogenous among different banking activities. In the case of mortgage credit, it was not possible to refute the hypothesis that the market is competitive (H=1.58).[83] This result seems to be compatible with the decline in mortgage interest rate spreads observed during recent years. As for financing to firms, the study suggested a market characterized by monopolistic competition (H=0.45). The latter result is in some way unexpected, given the relatively low interest rate margins in the aforementioned market and that firms, at least the large companies that account for most bank credit, have access to alternative sources of financing such as capital markets and foreign banks. Finally, in the case of credit to consumption, the hypothesis of a market characterized by low competition (H=-0.25) could not be rejected. This result was in line with interest rate margin rigidity for several services included in consumer credit, such as credit cards. [84]

5.4.2.   Bank fees and commissions

During 2006, the six largest banks' income from fees and commissions rose 14.9 percent in real terms compared to the previous year. The increase responds to the population's greater use of banking services rather than to increased prices. In fact, the infrastructure of retail payments has expanded considerably in recent years. The network of Point of Sale terminals (POS) and ATMs, as well as the number of credit and debit cards, has grown significantly (Graph 47).

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[82] The price of labor is obtained by dividing labor expenses by the number of employees for each bank. The price of financial resources is the average cost of funding, including current and term accounts. Finally, the price of physical capital is obtained by dividing capital expenditures such as rents, depreciation, and technology, by the value of fixed assets.

[83] Statistically, this figure is not significantly different from H=1.

[84] To prove this hypotheses, Wald tests were applied to the sum of input price coefficients.

Graph 47
Use of Bank Cards

a) Number of Cards Used [1]

b) Number of POS terminals and ATMs

c) Number of Operations Debit Card Operations in ATMs and POS terminals

Million cards

Thousand units

Million annual operations
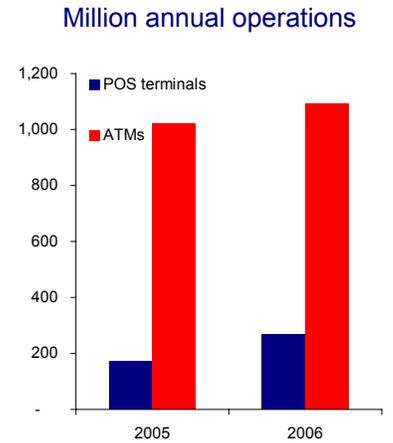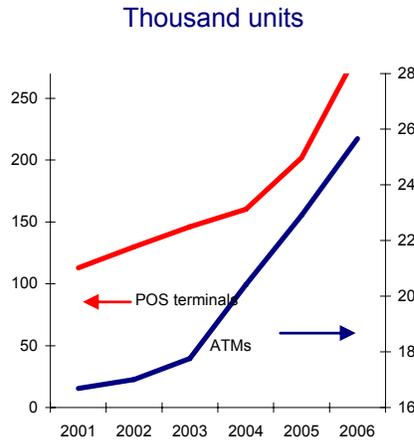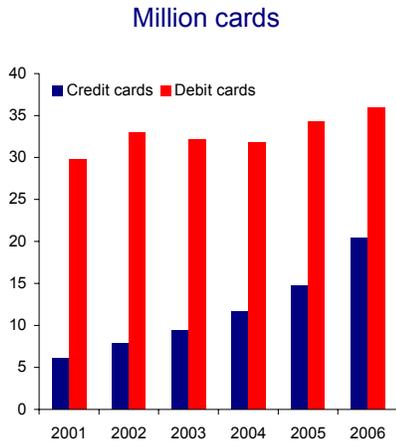
1/ Number of cards which registered at least one operation.
Figures at December 2006.
Source: Banco de México.

The use of bank payment methods has also risen in parallel to network expansion. The number of electronic transfers and transactions with cards at POS terminals has grown, while check transactions have tended to decline (Graph 48).

Graph 48
Evolution of Retail Payment Methods

a) Number of Check and Electronic Operations [1]

b) Number of Interbank and Internal Operations

c) Value of Check, Electronic and Direct Debit Operations

Million annual operations
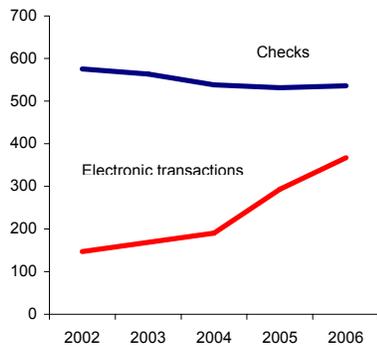
Million annual operations
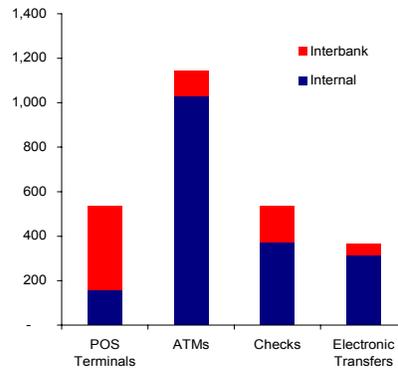
Trillion 2002 pesos
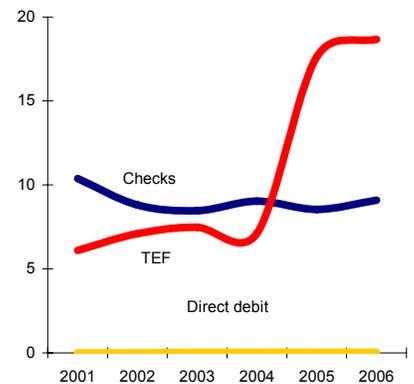
1/ Included transactions are: TEF, SPEI, direct debits, and credit card payments.
Figures at December 2006.
Source: Banco de México.

Table 9 shows several concentration indicators for the six largest banks. As shown, revenues from fees and commissions are extremely concentrated. However, the two largest banks have lost market participation to smaller banks during the last three years, a situation which has affected both income from fees and commissions as well as the number of credit cards and POS terminals.

Table 9
Concentration Measures[1]

	Total Income from Commissions		Income from Credit Card Commissions		Number of Credit Cards		Number of POS Terminals	
	2003	*2006*	*2003*	*2006*	*2003*	*2006*[2]	*2003*	*2006*
Particiption: 2 largest	57.9	54.7	74.9	67.7	64.5	53.3	56.1	50.9
Participation: 4 largest	83.8	81.8	93.2	87.3	87.9	83.3	85.0	80.7
Participation: 6 largest	95.8	93.8	98.8	92.5	93.5	90.2	99.7	94.3

1/ Percentage participation.
2/ Preliminary information.
Income from commissions refers to commissions charged.
Source: CNBV.

Analysis of the level and behavior of bank commissions is not a simple task due to the fact that commissions can be associated with the use of a particular service or refer to one account or one customer. Likewise, commissions can be charged once only, periodically, or per transaction. Banks are also able to apply price discrimination policies and subsidize some services to the detriment of others, meaning that there is no direct relationship between the commission amount and the cost the bank incurs in order to provide the corresponding service. Meanwhile, it is also difficult to make a direct comparison between the prevailing level of individual commissions in different countries, given that institutional arrangements and patterns tend to vary. Despite this, total income from fees and commissions, measured as a proportion of bank assets, provides useful information for making international comparisons.

5.4.3. Fees and commissions by service and by product

In order to evaluate the evolution of fees and commissions over time, two common and extensively used products were chosen: payroll accounts for individuals with checkbooks, and for those without checkbooks. The purpose of this analysis is to demonstrate the behavior of a price over time.[85] The corresponding prices were constructed using two approaches: i) by service, and ii) by product.

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[85] The study is based on data provided by commercial banks to Banco de México concerning maximum commissions charged for each service.

Commissions by service: The analysis estimated the price of a service over time (electronic transfers, for example) for the industry as a whole. Graph 49 shows the behavior of commissions for different services associated with payroll accounts.[86]

Graph 49
Commissions by Service

a) ATM Use.
Payroll Account without Checkbook

b) ATM Use.
Payroll Account with Checkbook

c) Transfers via TEF, SPEI and Checks.
Payroll Account with Checkbook

2002 pesos

2002 pesos

2002 pesos
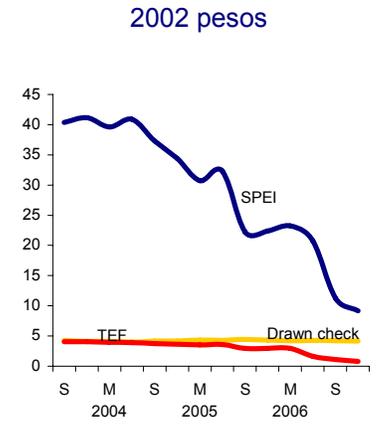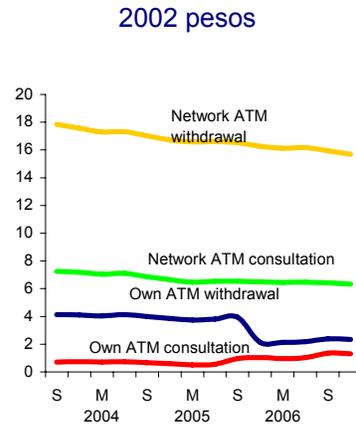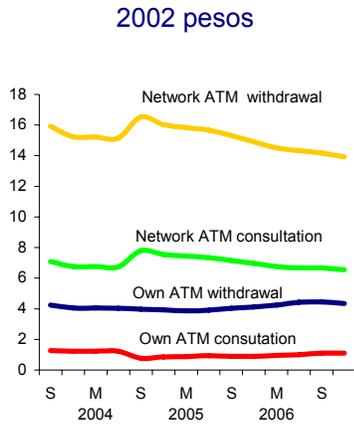
Figures at December 2006.
Source: Banco de México.

Commissions by product: An index of the cost an individual customer would incur when using different banking services associated with a certain product, such as electronic transfers, ATM consultation, or withdrawal (Box 15). Graph 50 illustrates the evolution of cost of use indexes for a payroll account with a checkbook and for one without a checkbook.

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[86] To construct a price index for a particular service (e.g., electronic transfers), the commissions each bank charges customers with similar profiles (e.g., users of payroll accounts with checkbooks) for the service were identified. Commissions were weighted by the corresponding bank's market participation and then added up to obtain the price of the service for the industry as a whole.

Graph 50
Commissions by Product

a) Use of a Payroll Account without Checkbook

Quarterly cost 2002 pesos

b) Use of a Payroll Account with Checkbook

Quarterly cost 2002 pesos
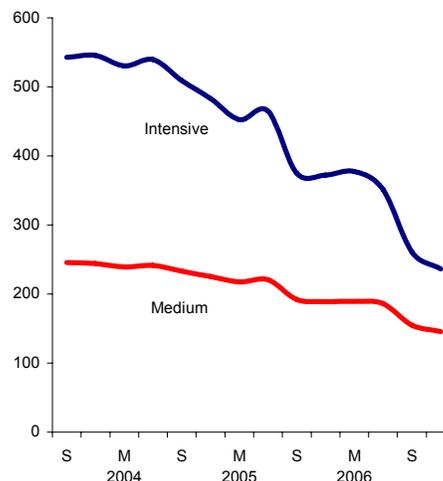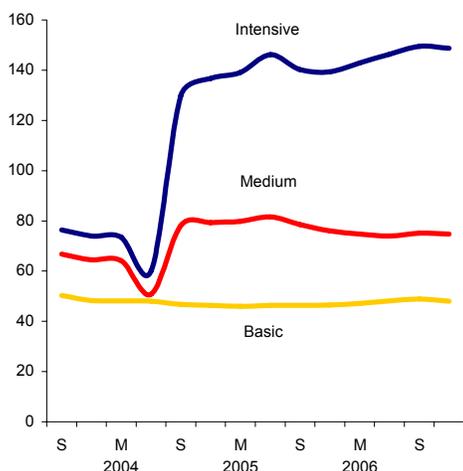
Figures at December 2006.
Source: Banco de México.

Box 15
Methodology for Calculating User Indexes

An index to measure the evolution of bank commissions requires the selection of an homogenous product, as well as the definition of all commissions associated to the use of such product. To this end, payroll accounts were chosen. For methodological reasons it was decided to distinguish between basic payroll accounts, which generally do not require a minimum balance and do not offer services such as a checkbook. The services taken into consideration were: cash withdrawal and balance consultation in banks' own ATMs and other banks' ATMs, electricity and telephone bill payment, balance consultation by phone, monthly internet access fee, credit card balance consultation and payment by internet as well as check issuance.

Use Vectors
This concept consists of defining the number of times each product or service is used during a certain time. For payroll accounts without checkbook three types of user were chosen: basic, medium and intensive according to the banking services used and the number of transactions made.

The basic user carried out most of their transactions through ATMs and by telephone, while medium and intensive users mainly used internet services.

As for payroll accounts with checkbook, two types of user were defined: medium and intensive. In both cases users carried out most of their transactions by internet, although the intensive user requires a higher number of operations.

Index Construction
Calculation of the quarterly cost of each product and user analyzed was defined as the sum of bank charges stemming from the use indicated by the vector. After estimating cost per product and user type, the weight of each bank's market participation in the product's supply was calculated. The weighted quarterly cost was made into an index which took the third quarter of 2003 as its base.

More than half of revenue from fees and commissions stem from services associated with settlement systems, among which credit card fees stand out. The infrastructure associated with the use of credit and debit cards in business establishments is relatively small, and the bank card business is highly concentrated (Table 9). There are also a large number of businesses that still do not accept such cards as a means of payment, a fact reflected in a reduced number of Points of Sale (POS) terminals per capita and in a high number of cards as a proportion of POS terminals (Graph 51b and c). Interbank commissions play an important part in the development of credit and debit card markets.

Graph 51
Bank Cards and POS Terminals

a) Card Transactions	b) Number of POS Terminals as a Proportion of the Population	c) Number of Bank Cards per POS Terminal
Annual Number of transactions per POS Terminal.	Number per million inhabitants	Number
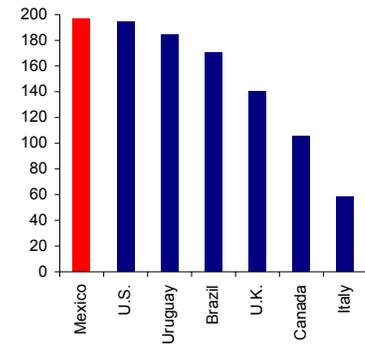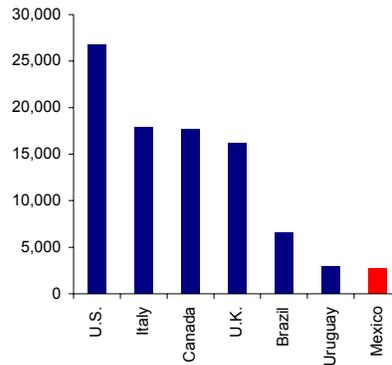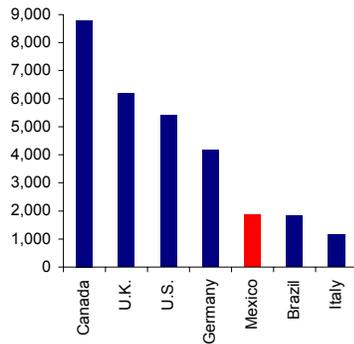
Figures for Mexico are from 2006, while those of other countries are from 2005.
Source: "Statistics on payment and settlement systems in selected countries."Committee on Payment and Settlement Systems. BIS; Nilson Report; "Payment System Statistics in Latin American and Caribbean Countries." Western Hemisphere Payment and Securities settlement forum, CEMLA, Banco de México and INEGI.

5.4.4.   Interbank fees and commissions

Among commissions charged by commercial banks, those that apply to the use of interbank networks are noteworthy. Such networks are extremely important in the economy, given that they allow payments to flow easily. Interbank commissions are those which banks charge each other for the operations their customers make. Such commissions only apply when an operation involves more than one bank. They are determined by agreement between the banks and are usually the same for each type of transaction. As a consequence, interbank commissions are coming under increasing international scrutiny.

Some of the most important interbank commissions are associated with electronic credit and direct debit transfers, as well as withdrawal of bank account deposits. Such commissions are charged for using ATMs, issuing checks and using debit or credit cards. The credit card business is included in those known as "two-sided markets" in economics literature.[87] These markets are characterized by the fact that the product offered must simultaneously satisfy two demands with different characteristics. In the case of credit cards, the first of these demands corresponds to businesses interested in accepting credit card payments, while the other refers to cardholders who wish to make them. Box 16 illustrates the way card payments function.

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[87]   Other two-sided markets include public television, newspapers, and software. See: Roson, R. (2005), Two-Sided Markets: A Tentative Survey, The Review of Network Economics, Vol. 4, Number 2, 142–160; Rochet, J. C. and Tirole, J. (2005), Two-Sided Markets: A Progress Report, IDEI Working Paper, N. 275; Wright, J. (2004), One-sided Logic in Two-sided Markets, The Review of Network Economics Vol. 3, Number 1, 42-63.

Box 16

Flow of a credit or debit card transaction made in a business establishment

Payment of goods and services minus
Interchange Fee (4)

Issuing Bank

Transfers promissory note
for the transaction amount (3)

**Business establishment's Bank
(acquirer)**

Differed debt
payment (7)

Statement
sent (6)

Transfers promissory
note for the
transaction amount (2)

Payment of the
Amount minus
Discount Rate (5)

Signing of a promissory note
for transaction amount (1)

Delivery of goods and services (1)

Cardholder

Business

Demand elesticities tend to be different for cardholders and business organizations. The elasticity of the former is usually higher at the level of bank commissions than that for businesses due to the fact that cash is a very close substitute for credit cards. However, there are many businesses, such as airlines, hotels, and restaurants, for whom accepting credit cards as a means of payment is very important. The sensitivity of businesses to bank commissions generally depends closely on the type of business activity. Thus, businesses with a high operating margin are more sensitive to the level of commissions than those with a lower margin.

In two-sided markets, it is common that one party subsidizes the other in order to encourage its participation. In credit card transactions, business organizations normally pay higher commissions than cardholders. The discount rate (Tasa de Descuento, TD) is the commission a business pays to the acquirer bank[88] every time one of its customers pays for a good or a service with a credit or debit card. A proportion of the commissions received by the acquirer bank are passed on to card issuing banks via payment of the so called interchange fee (Cuota de Intercambio, CI). Revenues received by the issuing bank from these fees allow it to cover its costs and are partially translated into lower annual fees, benefits, and bonuses for cardholders. In Mexico, the level and structure of interchange fees are determined by common agreement among banks and are the same for all of them. In other countries, interchange fees are determined individually by each credit card association.[89] The interchange fee and the discount rate are normally expressed as a proportion of a transaction's value.

In order to foster the development of more efficient means of payment, the Association of Mexican Banks (Asociación de Bancos de México, ABM), urged by Banco de México, has encouraged commercial banks to periodically review both the level of interchange fees and the methodology employed to determine them. The ABM has established a mechanism for determining them based on business type and has encouraged lowering them. As a result, between August

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[88] The acquirer bank installs and manages the POS terminal and is known as such because it acquires promissory notes signed by cardholders.
[89] Visa and Mastercard.

2004 and December 2006, weighted interchange fees for credit and debit cards declined 24 and 59 percent, respectively[90] (Graph 52a). Graph 52b and c, show different countries' credit and debit card interchange fees, while Table 10 shows maximum discount rates and interchange fees for credit and debit cards according to business type.

Graph 52
Interbank Fees

a) Interchange Fees for Credit and Debit Cards in Mexico
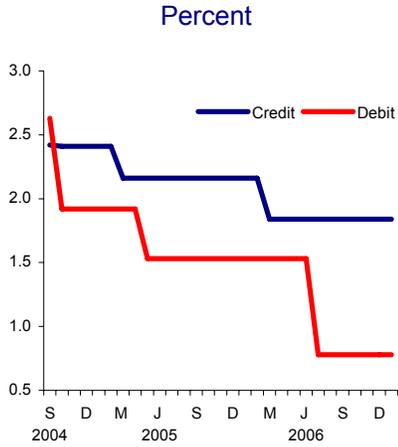
Percent

b) Interchange Fee for Credit Cards
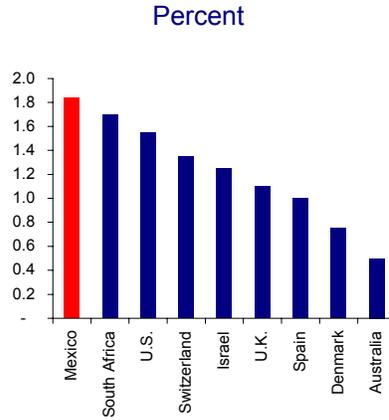
Percent

c) Interchange Fee for Debit Cards
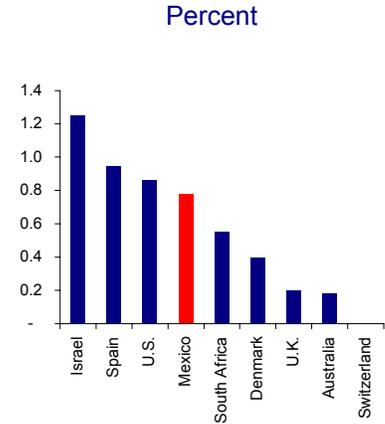
Percent

Source: Banco de México and other countries' central banks.

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[90] Average interchange fees declined from 2.42 to 1.84 percent for credit cards and 1.92 to 0.78 percent for debit cards. The weighted average for debit cards includes the 13.5 peso ceiling established for interchange fees.

Table 10
Maximum Discount Rates and Interchange Fees

Type of Business	Discount rates %				Interchange Fees %	
	Credit card		Debit card		Credit card	Debit card [1]
	Minimum	Maximum	Minimum	Maximum		
Charity	0.00	1.51	0.00	2.00	0.00	0.00
Gas stations	1.25	2.70	0.80	2.70	1.10	0.50
Colleges and Universities	1.80	4.80	1.30	4.80	1.25	0.75
Government	1.75	3.25	1.30	3.25	1.25	0.75
Large Surfaces [2]	2.05	2.80	$1.40	$4.00	1.75	$0.90
Fast Food	2.20	4.80	1.40	4.80	1.75	0.75
Pharmacies	2.30	4.80	1.60	4.80	1.75	1.00
Tolls	2.30	3.50	1.60	2.80	1.75	1.00
Parking Lots	2.30	3.50	1.60	2.98	1.75	1.00
Supermarkets	2.40	3.50	1.70	3.50	1.80	1.10
Road Passenger Transport	2.40	3.01	1.70	3.01	1.80	1.10
Car Rental	2.30	3.48	1.60	3.48	1.80	1.10
Travel Agencies	2.30	4.80	1.60	4.80	1.80	1.10
Hotels	2.30	4.95	1.50	4.95	1.80	1.10
Entertainment	2.30	6.00	1.60	6.00	1.80	1.10
Air Transport	2.25	4.80	1.00	4.80	1.80	0.75
Telecommunications	2.00	3.50	1.60	2.99	1.95	1.15
Insurance Companies	2.50	4.80	1.60	4.80	1.95	1.15
Hospitals	2.50	5.08	1.60	5.08	1.95	1.15
Restaurants	2.50	5.84	1.75	5.84	1.95	1.15
Retail	2.50	6.20	1.75	6.20	1.95	1.15
Others	2.50	6.00	1.75	6.00	1.95	1.15

1/ Interchange fees cannot exceed 13.50 pesos.
2/ This item's fees are fixed.
Source: Banco de México.

5.4.5.   Measures implemented by Banco de México

In May 2007, Congress approved a new Law for the Transparency and Regulation of Financial Services (Ley para la Transparencia y Ordenamiento de los Servicios Financieros, LTOSF), which replaced the old law of December 2003. Congress also approved several modifications to the Credit Institutions Law, the Law for the Protection and Defense of Financial Service Users, and the National Banking and Securities Commission Law. The aim of these reforms was to encourage competition and transparency in the provision of financial services, as well as to improve consumer protection.

The LTOSF enhances Banco de México's powers to regulate the commissions and fees charged for bank services. Under the provisions of this law, and with the aim of promoting a more competitive banking system, encouraging the use of efficient payment methods and protecting bank service users' interests, Banco de México has adopted a series of measures to:

i)   Promote transparency and improve information about prices and commissions.

ii)   Remove barriers to entry and stop discriminatory practices.

iii)   Establish policies for the determination of prices associated with the use of networks.

iv)   Protect consumer interests.

The most important measures were the following:

Transparency

i)   Banks must state the CAT in publicity and paperwork for all mortgages and loans with a value of less than 900 thousand Udis (Box 17).

ii)   Banks must inform the public, via their websites and brochures as well as publicity placed in branches, about the commissions they charge for providing payment services.

iii)   Banks must also report to Banco de México the amount of interbank commissions and fees charged, as well as any agreed modifications to them before their implementation.

iv)   Banco de México's website includes tables showing a comparison of commissions and offers commission and interest rate calculators allowing customers to evaluate the prices offered by different service providers.

v)   ATM operators must show the commission charged for withdrawal or balance consultation on their screens before an operation is carried out.

vi)   Banks must report on the interbank fees and discount rates they charge businesses for accepting credit and debit card payments.

Reduction of barriers to entry

i)   Banco de México decided to open participation in the Interbank Electronic Payment System (Sistema de Pagos Electrónicos Interbancarios, SPEI) to different non bank financial institutions.

ii)   The rule is eliminated in contracts between acquirer banks and affiliated businesses which obliged the latter not to discriminate between debit and credit cards.

iii)   Banks are obliged to receive checks and fund transfers from other banks to pay for loans and services granted by the receiver.

iv)   Banks must provide, at no additional cost, interbank electronic transfer receivers with detailed information on the origin of such transactions.

Box 17

Total Annual Cost (Costo Anual Total, CAT)

In May 2006, Banco de México issued regulation designed to protect credit users, establishing the information disclosure requirements for financial institutions that grant credit.

One of the most important regulatory measures has been the disclosure of the Total Annual Cost (CAT) of mortgage credits and loans of less than 900 thousand Udis.

The CAT is defined as "the cost of financing expressed in annual percentage terms that, for information and comparison purposes, incorporates all inherent costs and expenses included in credits granted by institutions". Such concept includes:

- interest rate
- commissions
- insurance premiums (excluding automobiles)
- VAT
- discounts and bonuses
- difference between a good's credit and cash price
- and any other credit authorization charge made to the user.

Concepts similar to CAT are used in most developed nations. In the U.S., Canada and the United Kingdom CAT is known as "APR" (*Annual Percentage Rate*), while in Spain it goes by the name of Equivalent Annual Rate (Tasa Anual Equivalente, TAE).

The model adopted in Banco de México's regulations is similar to those currently applied in the United Kingdom's Consumer Credit Act.

CAT is the value i, expressed as a percentage, which satisfies the following equation:

$$\sum_{j=1}^{M} \frac{A_j}{(1+i)^{t_j}} = \sum_{k=1}^{N} \frac{B_k}{(1+i)^{s_k}}$$

Where:

M = Total number of advances of credit.

j = Consecutive number which identifies each advance.

A_j = Amount of the j-th advance.

N = Total number of installments.

k = Consecutive number which identifies each installment.

B_k = Amount of k-th installment.

t_i = Time interval, expressed as fractions of a year, that elapses between the date the first advance is taken and the date of the j-th advance.

s_k = Time interval, expressed as fractions of a year, that elapses between the date the first advance is taken and the date of the k-th installment.

Use of networks

i) Electronic transfers are promoted through the elimination of interbank commissions the issuing bank pays to the receiver for an electronic transfer.

ii) The commission Banco de México charges for each transaction carried out using SPEI has been reduced from one peso to 50 cents.

iii) It has been sugggested that banks limit the interbank commission to 11 pesos for SPEI transfers of less than 100 thousand pesos.

iv) Arrangements have been made enabling banks to allow their customers to carry out electronic transfers of up to 50 thousand pesos through the SPEI system.

v) Regarding electronic fund transfers (Transacciones Electrónicas de Fondos, TEF), it was suggested banks charge no more than 5 pesos per transfer.

Consumer Protection

i) Determination has been made of the minimum amount of information to be included in credit contracts. They must mention the CAT, ordinary, and moratorium interest rates, as well as commission concepts, amounts, and periodicity. Thus, banks have to provide their customers with a copy of the contract and the corresponding amortization table.

ii) Intermediaries can only charge the commissions agreed upon by contract.

iii) Advanced payments should be allowed and applied to the loan unpaid balance.

6.   Other Financial Intermediaries

The relative importance of various financial intermediaries other than commercial banks has risen significantly in recent years. For instance, the assets of Siefores grew at an average real annual rate of 17.5 percent during 2006 compared to their level in 2005, while investment funds' assets climbed 32.7 percent over the same period. The growth of Sofoles has also been noteworthy, although it has slowed in response to the expansion of bank credit, the sale of mortgage portfolios to commercial banks, and portfolio securitization.

From Banco de México's point of view, the growth of non-bank intermediaries is significant given the risks this could represent for the stability of the financial system and their participation in financing to households and firms. Prudent management of the risks such intermediaries are exposed to, together with their limited contact with the rest of the financial system, mean their growth does not yet seem to imply risks to financial stability. Furthermore, the current development of such intermediaries, particularly Siefores and Sofoles, is contributing to an improvement in the efficiency of financial intermediation and to making such services more accessible to previously unattended socioeconomic segments of the population. The following section analyzes the recent development of Afores and Sofoles.

6.1.   Pension Fund Managers (Afores)

As of December 2006, Afores managed 719.6 billion pesos through Siefores. This figure represents 7.7 percent of GDP, making Siefores the most important private financial intermediary after commercial banks.[91]

Reforms to the Social Security Law and the Retirement Savings System Law have given rise to the current Retirement Savings System (SAR). As of 1997, workers affiliated with the IMSS must choose a Retirement Fund Administrator (Administradora de Fondos para el Retiro, or Afore) to manage their retirement fund contributions. The SAR replaced the defined benefits system managed by the IMSS with one of defined contributions, where the worker is the sole owner of accumulated assets and must invest them, via Afores, in investment funds specialized in retirement savings (Siefores). At retirement age a worker can access the wealth they have accumulated during their active working life. This system also enables beneficiaries to make voluntary contributions to increase their savings and introduced the following benefits:

i)   Due to the fact that each worker create their own retirement savings funds, defined contribution systems are viable over the long-term, and their fiscal cost is lower than that for defined benefit systems. Defined benefit schemes can become unsustainable when a population's demographic structure changes, given that active workers' contributions pay retired workers' pensions. If the number of retired individuals increases at a higher rate than the number of persons of working age, the

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[91] The stock of Siefores assets differs from the balance of the SAR reported as Monetary Aggregates in Table 2, due to the fact that the latter only includes Siefores' portfolio of securities issued in Mexico (it excludes foreign and variable yield assets). It also includes workers' housing funds (Infonavit and Fovissste), ISSSTE pension funds, and the concentration account.

resources contributed by the latter are insufficient to meet the obligations they must cover.[92]

ii)   In defined contribution systems, workers' retirement funds are more closely related to wage behavior than in defined benefit systems.

iii)   The SAR has already had a positive effect on financial savings in Mexico. Savings have risen from 41.7 percent of GDP in 2000 to 54.9 percent in December 2006, while SAR savings increased from 6.6 percent to 12.1 percent of GDP during the same period. [93]

iv)   The SAR has enabled the development of long-term institutional investors (Siefores), which are essential for the growth of capital markets.

In recent years, the National Commission for the Retirement Savings System (Comisión Nacional de Ahorro para el Retiro, or Consar) has adopted a series of measures designed to: i) encourage competition, ii) increase the yield of Siefores' assets, and iii) broaden the system's coverage.

i)   In order to stimulate competition in the sector, entry barriers were reduced and greater mobility among Afores affiliates was encouraged. Thus, fees of the Company Operating the National SAR Data Base (Procesar)[94] were revised, and changes were made to allocation standards for workers who do not choose Afores.[95] Such modifications have led to the entry of eight new Afores during the last two years and have increased the number of accounts transferred between Afores.[96] The latter has also resulted in a reduction in the industry's concentration indexes.[97]

ii)   To increase Siefores' yields, their investment regime was made more flexible, allowing them to purchase financial assets different from those issued by the federal government and to increase the diversification of their investments. Thus, investment in variable yield instruments, international securities, and derivatives was authorized. Investment alternatives were also authorized for workers by creating two investment funds: Fund 1, for workers close to retirement age, invested exclusively in fixed rate instruments; and Fund 2, for workers below 56 years of age, allowed to invest part of their resources in variable rate instruments. Such measures have led to more diversified Siefores portfolios, invested in instruments which can offer higher yields.

iii)   The reform of the law governing ISSSTE stipulates that an individual account should be opened in the National Public Employees' Fund (Fondo

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[92] This phenomenon occurs when the birth rate declines and life expectancy increases.

[93] SAR figures include Siefores' securities portfolios (excluding foreign and variable yield assets), workers' housing funds, ISSSTE pension funds, and the concentration account.

[94] Among other measures, Procesar commissions were reduced in 2004, and the fixed fee was substituted by commissions charged in proportion to the balance.

[95] In 2005, the law governing SAR was modified to allow workers to shift to a cheaper Afore whenever they wished or to any other Afore once per year. The 2007 reform of the SAR law changed this rule, as will be explained below.

[96] In 2003, 431 thousand account transfers between Afores were made, while in 2006 there were 3,849,000 such transfers. The high number of transfers during 2006 led to changes in mechanics and verification rules.

[97] In 2000 the four largest Afores controlled 54 percent of all accounts, while in 2006 this percentage had fallen to 45 percent.

Nacional de los Trabajadores al Servicio del Estado, Pensionissste) for each affiliated worker. This fund will manage the resources accumulated in individual SAR 92[98] accounts and deposit them with Banco de México for safe keeping and custody.

iv)   Finally, in order to widen the system's scope, rules were modified to allow independent workers to have an individual retirement savings account in an Afore[99] and be able to make voluntary contributions to it.

Changes introduced to the law governing SAR and approved by Congress in April 2007 are particularly important. The most relevant of these modifications are:

i)   Commissions on flows were eliminated, meaning Afores can only charge fees on managed balances.

ii)   Regulations concerning workers' transfers among Afores were revised. Workers will be able to change their fund administrator twelve months after registering in the system or 12 months after the last change. Before twelve months have passed, they can only switch to Afores that offer a higher Net Yield Index,[100] and once they have changed, they will have to remain with the new manager for at least twelve months.

iii)   The methodology for assigning workers who had not chosen an administrator was modified. Workers will be assigned to the Afores with the highest Net Yield Indexes.

iv)   Consar was given the authority to issue regulations on sales force wages.

v)   Minimum requirements were established for general directors of public and private Afores.

6.1.1.   Historic Profitability of Afores

There are currently 21 Afores, eight of which received permission to operate during the last two years. The average profitability of Afores, measured by their ROE, has tended to decline since 2004. This performance can be attributed, on one hand, to the reduced growth rate of income from commissions and, on the other, to the rebound in sales costs. Thus, average ROE (asset weighted) for the seven largest Afores has declined from 48.1 percent at the end of 2003 to 22.6 percent in December 2006 (Graph 53a).

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[98] SAR 92 was created in February 1992 and consists of an obligatory savings plan totally composed of employer contributions. The pension system that began operating in July 1997 integrated IMSS affilates' SAR 92 Retirement contributions to the Retirement, Involuntary Unemployment in Old Age and Old Age (Retiro, Cesantía en Edad Avanzada y Vejez, or RCV) Afores' sub-account. Resources accumulated between 1992 and 1997 can be transferred to an Afore of the worker's choice if requested. If the worker does not opt for this right, their resources will continue to be invested in federal government instruments through Banco de México.

[99] As of December 2006, voluntary saving represented 0.33 percent of total resources administered by the Afores.

[100] Consar's Board of Governors will determine the methodology for calculating the Net Yield Index.

Graph 53
Yield, Income from Commissions and Administration Costs (Seven Largest Afores)

a) Net Profit as Proportion of Equity (ROE)	b) Income from Commissions	c) Administration Costs
Percent	Real annual percentage variation	Real annual percentage variation
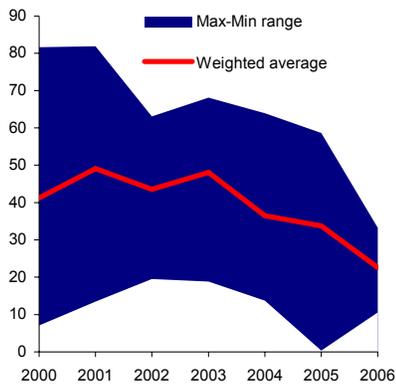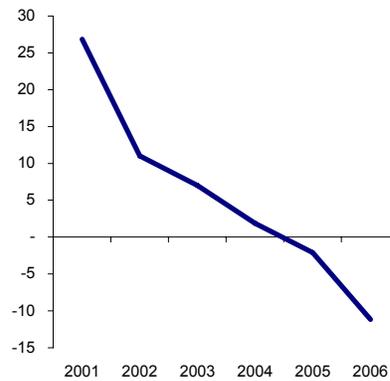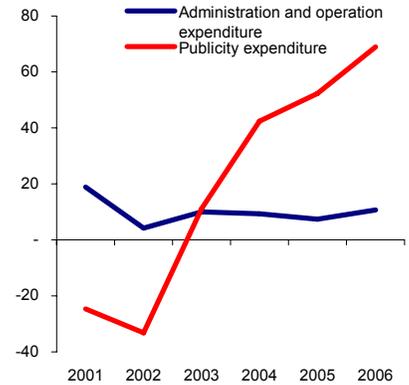
Figures as of December 2006.
Source: Consar

The drop in profits is compatible with intensified competition in the sector. Nevertheless, the increase and composition of administration costs (Graph 53c) seems to indicate that Afores are competing for affiliates by spending more on sales while charging lower fees. Increased costs have led to deterioration in these intermediaries' efficiency indexes[101] (asset weighted). This index for the seven largest Afores rose from 36.2 percent in 2003 to 57.7 percent in December 2006.

6.1.2. Contributions to SAR and commissions

The pensions system is mandatory for all workers affiliated with the IMSS. Each affiliate has an individual account managed by an Afore, and during the working life of every affiliate, contributions made by the employer, federal government, and the worker accumulate in the account. Table 11 explains the bimonthly contributions made by the three aforementioned sectors.

Table 11
Contribution Structure[1]
Percent

Contribution	Employer	Worker	Government	Total	
Retirement	2.00	-	-	2.00	SBC [2]
Involuntary Unemployment and Old Age	3.15	1.13	0.23	4.50	SBC
Social Contribution [3]	-	-	5.50	5.50	SMG [4]

1/ Article 168 of the Social Security Law.
2/ Contribution Wage (SBC: Salario Base de Cotización).
3/ Contributed monthly for each wage day and updated on a quarterly basis according to inflation.
4/ General Minimum Wage in the Federal District.
Source: Consar.

Until modifications to SAR regulation come into force, Afores will charge fees for administering each individual account according to two concepts: i) the balance, and ii) the flow.

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[101] The efficiency index is defined as the ratio of administrative costs to total income.

i) The fee charged on the balance is the percentage each Afore accrues on the total amount accumulated in an individual account.

ii) The fee charged on the flow is the percentage an Afore charges on worker-employer contributions. Such fees are only charged on worker-employer contributions and do not apply to the so called social fee, voluntary contributions or SAR92 transfers. These commissions are expressed as a percentage of the contribution wage (Salario Base de Cotización, SBC), and not as a proportion of contributions. For instance, a fee of 1.3 percent of SBC translates into a fee of 20 percent on the worker-employer contribution. Table 12 shows the fees that were in force at the end of 2005 and 2006.

Table 12
Structure of Management Fees
Percent

Afore	On Contribution Flows [1/]		On the Balance	
	2005	2006	2005	2006
Actinver	15.8	15.7	0.20	0.20
Afirme Bajío	9.5	9.5	0.25	0.24
Ahorra Ahora [2/]	-	13.8	-	0.20
Argos [2/]	-	16.5	-	0.33
Azteca	16.9	13.8	0.15	0.40
Banamex	26.2	11.5	-	1.48
Bancomer	25.8	18.5	-	0.50
Banorte Generali	21.5	19.2	0.50	0.40
Coppel [2/]	-	14.2	-	0.30
De la Gente [2/]	-	13.8	-	0.31
HSBC	21.8	21.5	0.40	0.40
Inbursa	7.7	7.7	0.50	0.50
ING	25.8	20.3	-	0.30
Invercap	15.8	15.8	0.20	0.20
IXE	16.9	16.9	0.34	0.33
Metlife	18.9	18.9	0.25	0.25
Principal	24.6	24.6	0.35	0.35
Profuturo GNP	25.7	25.2	0.50	0.50
Santander Mexicano	24.6	19.7	0.70	0.50
Scotia [2/]	-	18.8	-	0.26
XXI	20.0	20.0	0.20	0.20
Average	19.9	17.0	0.35	0.39

Figures at December 2005 and 2006.
1/ The commission on contribution flows is calculated by dividing the commission on the SBC flow by 0.065.
2/ Began operating after September 2005.
Source: Consar.

Charging fees on two different concepts (flow and balance) complicates a comparison of charges made by Afores.[102] This difficulty was one of the main reasons for the elimination of flow commissions. The new commissions system

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[102] In 2001, the OECD described Mexico's system of comissions as the most complicated in Latin America. See section 1:6 b Book 2 of the Private Insurance and Pensions Compendium for Emerging Economies on http://www.oecd.org/dataoecd/8/20/1816104.pdf.

will allow affiliates to compare Afores charges with just one figure, which together with publication of the Net Yield Index, will help workers choose a fund administrator. The index should also eliminate the perverse incentives that the Equivalent Commission on the Balance (Comisión Equivalente sobre Saldo, CE)[103] gave Afores.

6.1.3.   Siefores yields

The most common way of evaluating an investment's performance is by calculating its rate of return. However, there is more than one methodology for calculating this, rate and it can vary significantly depending on the method employed. There can also be considerable conceptual differences and, as a result, not all methodologies are comparable, nor do they serve the same purpose.[104] Once the modifications to the law governing SAR were published, the concept of profits became even more important, given that workers' movements between Afores could depend on the Net Return Index.

Management returns

Afores manage their affiliates' resources according to Consar's Investment Guidelines. The management yield is used to measure percentage increases in Siefores shares before balance commissions are charged. Table 13 shows the real annual management yields of total resources invested by Siefores between 1998 and December 2006.[105]

Yields for affiliates

Management yields only offer data on the performance of Siefores in regard to their management of the resources entrusted to them by workers and not on the returns obtained by affiliates for the resources they contributed. Table 13 shows the returns obtained by affiliates between 1998 and December 2006.[106] Affiliates resources include SAR92 transfers made between 1998 and 2006 (32.6 billion pesos), which, as mentioned previously, are not subject to flow fees.[107]

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[103] To facilitate comparison between the commissions charged by Afores independantly of the reason for which they are charged, Consar publishes an indicator (Equivalent Commission on the Balance, or CE). However, this indicator is very sensitive to the assumptions used in its contruction. Thus, when the CE is calculated with a 25-year time horizon, the commission charged on balances had a greater impact on the indicator and, as a result, Afores reduced these commissions. Nevertheless, when the time horizon for the CE calculations was changed to 1 year, the flow commission had a higher impact and, as a result, Afores began to reduce this commission and increase the other.

[104] For this reason several countries have agreed to standards for presenting the results of certain investment vehicles, such as mutual funds and hedge funds. As an example, see global investment performance standards (GIPS) on: www.cfainstitute.org.

[105] To obtain the management yield (r_t), the value of net assets (share price (P_t)) is added to the number of assets in circulation (N_t)), balance commissions (commissions from previous periods (CA_t), and commissions from the current period (CH_t). The yield reflects the variation in the quantity between two different dates.

$$r_t = \frac{\frac{(P_t \times N_{t-1}) + CA_{t-1}}{N_{t-1}} + \frac{CH_{t-2}}{N_{t-2}}}{\frac{(P_{t-1} \times N_{t-2}) + CH_{t-2}}{N_{t-2}}} - 1$$

[106] The formula employed for calculating each period's yield is shown in Box 18.

[107] As of June 1997, the accumulated balance of SAR 92 was 103.7 billion pesos, 34.9 billion of which corresponded to the IMSS Retirement subaccount, 8.2 billion to ISSSTE, and 60.4 billion to Infonavit and FOVISSSTE housing funds. From 1998 IMSS affiliates' resources in the SAR 92 Retirement subaccount

Table 13
Management and Affiliates' Yield
Real Annual Percentage

Year	Management Yield	Affiliate's Yield
1998	5.9	-0.1
1999	13.6	8.2
2000	7.6	3.4
2001	12.9	9.0
2002	5.0	1.9
2003	6.5	3.7
2004	1.7	-0.6
2005	7.7	5.5
2006	8.6	6.7
Average	7.7	4.1

Average corresponds to the geometric mean of annual yields for the whole system.
Source: Banco de México.

Although the results stated above show that the return in real terms obtained by affiliates as a whole has been positive, the result is not the same as that received by each individual worker. The existence of two types of fees (flow and balance), means the difference between returns obtained by Siefores (management returns) and those received by each individual worker do not just depend on the amount of fees charged, but also on the particular characteristics of every affiliate. Thus, the rate of return a worker obtains on contributions depends on: i) the SBC, ii) the frequency of contributions, iii) the resources transferred from SAR92, and iv) the savings balance of in the Siefore.

As would be expected, changes in fees can modify the difference between management and affiliate returns. However, flow fees have an impact on an affiliate's rate of return that is greater during the first years of contributions than when they have accumulated a certain amount of savings. The latter is due to the fact that as time passes and invested resources grow, the relative weight of fees on flows declines. As a result, the average return on contributions will be higher as accumulated resources grow in relation to annual contributions. Thus, during the first few years, yields for an individual affiliate tend to be lower, or even negative. This phenomenon has also occurred in other countries where fees are charged on flows, such as Chile, Argentina, Uruguay, and Peru. This phenomenon will vanish for affiliates that enter the system after commissions on flows are eliminated, given that the returns they obtain will be independent of their particular

began to be transferred to Afores. Between 1998 and November 2006 32.6 billion pesos were transferred from SAR 92 to Afores. As a result of the December 24, 2002 decree reforming the SAR's Law, the total balance of the SAR 92 Retirement sub-account (19.6 billion pesos) was transferred to the federal government. Such balance corresponded to workers affiliated to the IMSS who had still not transferred their funds to an Afore and whose database information hindered clear identification. In line with the aforementioned decree, the federal government maintains the obligation to pay funds to workers who can prove their ownership. 33.4 billion pesos from SAR ISSSTE remain deposited in the SAR 92 account at Banco de México.

characteristics.[108] Table 14 presents a comparison of management returns and those obtained by affiliates in each of the Siefores.[109]

Table 14
Yield for Affiliates[110]
Real annual percent

Afore	Average Management Yield[1/]	Affiliate's Historic Yield
Banamex	8.1	4.8
Bancomer	7.3	4.1
Banorte	7.5	3.5
HSBC	7.4	3.7
Inbursa	6.8	5.1
ING	7.6	3.8
Principal	6.7	4.4
Profuturo	8.3	4.3
Santander	7.6	2.6
XXI	7.8	4.4
Actinver [1/]	5.3	-0.6
Azteca [1/]	4.3	-1.0
Ixe [2/]	7.5	1.1
Invercap [3/]	8.4	1.6
Sistema	7.5	4.1

1/ Geometric average of real annual yields between August 1998 and December 2006.
2/ Geometric average of real annual yields assuming the average management yield observed between 1998 and December 2006 remains constant.
3/ Data as of 2003.
4/ Data as of 2004.
5/ Data as of 2005.
6/ Average real annual yield of Siefores, weighted by the amount of their assets. Weighted averages of management yields and for system affiliates do not have to coincide with geometric averages reported in the above Table.
Source: Banco de México.

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[108] The condition necessary for an affiliate who does not pay flow commissions to obtain positive yields will be that $r_t/(1+r_t) > \alpha_t$, where r_t is management yield in the period t, y α_t is the commission charged on the balance in the period t.

[109] The federal government's social contributions and SAR 92 transfers are free from flow comissions, but not from balance commissions. The social contribution is a proportion of the general minimum wage and, therefore, has no relationship with a worker's contribution wage (SBC). This means that the lower a worker's wage, the higher the yield they would obtain on their contributions due to the higher relative weight of social contributions and SAR 92 transfers. For instance, the real average rate of yield between 1998 and 2006 for a worker with a contribution wage equal to five minimum wages, a SAR 92 of 5,000 pesos and whose resources are invested in a Siefore with an average yield of 7.6 percent, would be 3.2 percent. In contrast to this, a worker with the same characteristics, but with no savings in the SAR 92, would be 0.5 percent.

[110] Yield indicators shown in this report do not coincide with those published by other institutions due to methodological differences. Such differences can lead to significant differences between estimates, despite the fact that the same resources are considered. The methodology used for estimating the yields shown in Table 14 is explained in Box 18. Consar calculates affiliates' yields using the Internal Rate of Return (Tasa Interna de Retorno, TIR). TIR allows the flow of affiliates' contributions, including SAR 92 transfers, to equal total resources accumulated at the end of the period. Such methodology assumes that the rate of yield is the same for all periods.

Box 18

Model for the Analysis of Siefores' Historic Yield

The objective of the model described below is to evaluate the return Siefores offer to affiliates and identify the proportion of the return of the fund which is actually transferred to the affiliates.

Model's Development

The model was based on assuming the structure of affiliate contributions made in each time period t, denoted by f_t. Once the contribution is deposited, the Siefore charges a fee on contributions (flow fee), indicated by λ_t[1]. This fee is the result of dividing the commission as a percentage of the wage contribution (SBC) by 0.065[2].

$$\lambda_t = \frac{\text{fee as a percentage of SBC}}{0.065}$$

Thus, the proportion of the contribution that actually enters an individual worker's account in each period t is given by

$$(1-\lambda_t)\cdot f_t$$

The annual social contribution CS_t, which is not subject to flow fee, is then added to the above. After including the social contribution, the amount entering an affiliate's account in each period is given by:

$$(1-\lambda_t)\cdot f_t + CS_t$$

In some cases an amount that is not subject to flow fees can be included, such as the amount corresponding to SAR92, represented by S_t. In this case the amount entering an affiliate's account is:

$$(1-\lambda_t)\cdot f_t + CS_t + S_t$$

Normally $S_0 \geq 0$ and $S_t = 0$ for all $t>0$. The aforementioned quantity corresponds to the amount invested in the Siefore, so that at the end of the period "t", if a return of r_t was obtained, the result would be:

$$\left[(1-\lambda_t)\cdot f_t + CS_t + S_t\right]\cdot(1+r_t)$$

If α_t is the fee on the accumulated balance in the Siefore account, then the balance for the affiliate at the end of the period, once all fees have been charged is:

$$\left[(1-\lambda_t)\cdot f_t + CS_t + S_t\right]\cdot(1+r_t)\cdot(1-\alpha_t)$$

The amount remains in the Siefore and its value increases according to the returns obtained by the funds management. The fees charged on the accumulated balance is carried out in the same way. The value of the contribution, once flow and balance fees have been charged, at time t and accumulated until year T, represented by $W_{t,T}$, is:

$$W_{t,T} = \left[(1-\lambda_t)\cdot f_t + CS_t + S_t\right]\prod_{k=t}^{T}(1+r_k)\cdot(1-\alpha_k) \quad \cdot(1)$$

Finally, the amount accumulated as a result of a worker's contributions during T years, identified by W_T, is the sum of all contributions; that is:

$$W_T = \sum_{t=1}^{T}\left[\left[(1-\lambda_t)\cdot f_t + CS_t + S_t\right]\prod_{k=t}^{T}(1+r_k)\cdot(1-\alpha_k)\right] \cdots(2)$$

The following recursive relationship can be used to calculate wealth accumulated up to year T,:

$$W_T = \left[(1-\lambda_T)\cdot f_T + CS_T + S_T + W_{T-1}\right](1+r_T)\cdot(1-\alpha_T)$$
$$W_0 = 0$$

Return Calculations

In order to compare with other investments, it is necessary to find the rate of return each Siefore offers its affiliates. One methodology which is in line with the standards the institute of Certified Financial Analysts (CFA) established in Global Investment Performance Standards (GIPS), used to show the behavior of investment funds, is the *equivalent annual return* method described below.

Equivalent Annual Return

In order to estimate the equivalent annual return a worker receives, it is necessary to calculate the rate of return generated by their wealth during the year analyzed. The rate of return is implicitly defined as the ρ_t that generates the same amount of wealth in time t, according to the following:

$$(1+\rho_t) = \frac{W_t}{f_t + CS_t + S_t + W_{t-1}} \qquad \dots(3)$$
$$= \left(1 - \frac{\lambda_t f_t}{f_t + CS_t + S_t + W_{t-1}}\right)(1+r_t)(1-\alpha_t)$$

In this case, ρ_t represents the annual return generated during the year t by the contributions made in year t, together with the wealth accumulated up until year t. Finally, *the equivalent annual return* ($\overline{\rho}_T$) is simply the return equivalent to the annual return obtained by investing one monetary unit for T years, at each successive rate ρ_t, i.e.:

$$\overline{\rho}_T = \sqrt[T]{\prod_{t=1}^{T}(1+\rho_t)} - 1 \qquad \dots(4)$$

The equivalent annual return is a measure that allows the determination of the sensitivity of the two types of fees and what proportion of the return obtained by the Siefore is passed on to the affiliate. In other words, the equivalent annual return includes all fees charged on every contribution.

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[1] The fee is canceled when changes to the Retirement Savings System Law, passed by Congress in April 2007, come into effect. Thus the methodology described can be adjusted making $\lambda_t = 0$ when this fee is eliminated:

$$(1+\rho_t) = (1+r_t)(1-\alpha_t)$$

[2] 6.5 is the percentage of SBC from which the affiliate's contribution in the Siefore is obtained. Dividing the contribution wage (SBC) flow fee by 0.065, gives the commission in terms of the affiliate's contribution, which is useful for employing the model.

6.2. Limited purpose non-bank banks (Sofoles)

Sofoles are financial institutions with the purpose of granting credit to a determined activity or sector. These institutions obtain funding via the placement of instruments registered in the National Securities Registry (Registro Nacional de Valores) or through loans from other financial intermediaries (Graph 54c). In December 2006, 57 Sofoles were in operation, of which 18 granted financing to the mortgage sector, 16 to private firms, 9 to agricultural activities, 8 to consumption, 5 to the automotive sector, and one to infrastructure projects. As for the destination of such financing, as of December 2006, the mortgage and automobile sectors accounted for the majority of the Sofoles portfolio, 55 and 28 percent, respectively (Graph 54a).

Graph 54
Evolution of Sofoles Credit and Sources of Financing

a) Evolution of Sofoles Credit Portfolio by Sector

b) Credit Portfolio
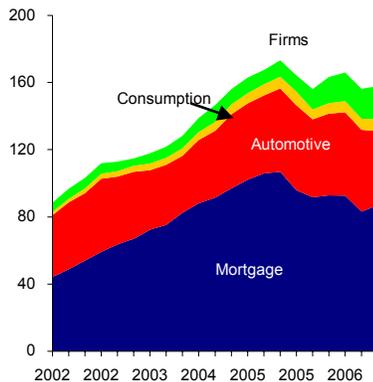
c) Sources of Sofoles Financing

Billion 2002 pesos

Real annual percentage change

Billion 2002 pesos

Figures at December 2006.
Source: CNBV.

Figures at December 2006.
1/ Others: includes agricultural, firm and consumer credit Sofoles.
Source: CNBV.
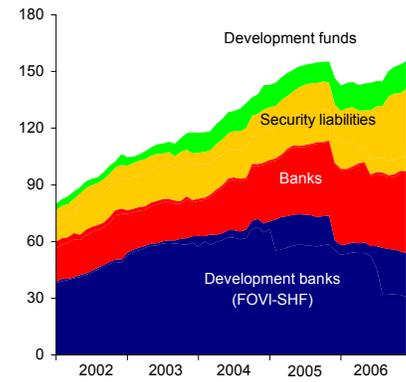
Figures at December 2006.
Source: CNBV.

The development of Sofoles (Graph 54b) can be partly explained by the limited availability of bank financing which prevailed after the 1994 crisis and the fact that they are subject to less restrictive regulations than those for commercial banks.[111] However, the growth of bank credit to households and commercial banks' purchase of Sofoles' mortgage portfolios have meant that the latter have lost relative importance in total financing to the private sector.

6.2.1. Profitability

As of December 2006, the average profitability of mortgage and automobile Sofoles, measured by their return on equity (ROE), was 17 and 16 percent, respectively.

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[111] Due to the fact that Sofoles do not receive deposits from the public, these intermediaries are subject (when they do not have shareholder links with a commercial bank) to a less restrictive regulatory framework than banks regarding standards for corporate governance, capitalization rules, portfolio concentration, and the creation of reserves.

Graph 55
Profitability

a) Net Profit

Billion 2002 pesos
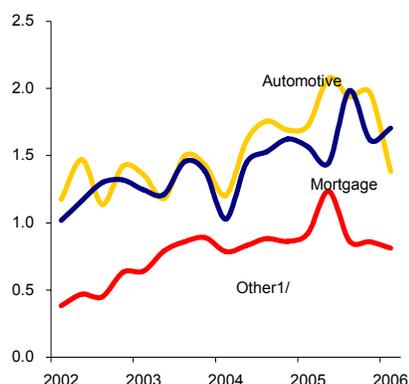
b) Net Profit as a Proportion of Equity (ROE)

Percent
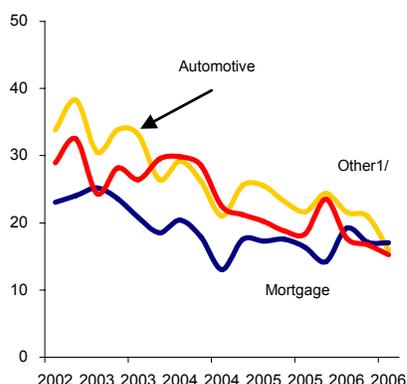
c) Income from Commissions as a Proportion of Total Income

Percent

Figures at December 2006.
1/ Others: includes agricultural, firm and consumer credit Sofoles.
Source: CNBV.

Figures at December 2006.
1/ Others: includes agricultural, firm and consumer credit Sofoles.
Source: CNBV.
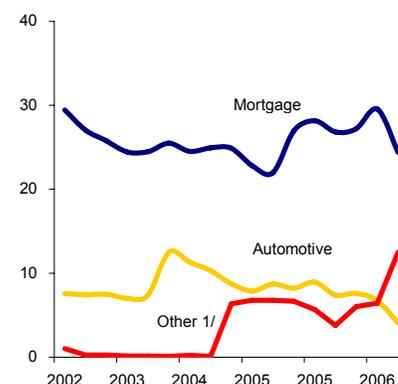
Figures at December 2006.
1/ Others: includes agricultural, firm and consumer credit Sofoles.
Source: CNBV.

Commissions are an important component of mortgage Sofoles' revenues, having represented 24.4 percent of their total income throughout 2006. This result is in contrast to the remaining Sofoles, for which commissions accounted for 15 percent of total revenues (Graph 55c).

Table 15
Structure of Sofoles Income
Percent

Income	Mortgage	Automotive	Others[1]	System
Net Interest Income	73.7	72.7	84.0	75.8
Net Commissions	24.4	4.1	12.5	15.1
Others[2]	1.9	23.2	3.5	9.1

Figures at December 2006.
1/ Others: includes agricultural, firm and consumer Sofoles.
2/ Others: Includes other net products and participation in subsidiaries.
Source: CNBV.

Average net interest income accounted for 75.8 percent of Sofoles' total income during 2006 (Table 15). This result was obtained even though the average cost of financing for these intermediaries is higher than the TIIE (Graph 56a). The latter reflects the fact that the spread between Sofoles' lending and deposit interest rates is lower than for commercial banks (Graph 56b and c).

Securitization of mortgage assets has allowed Sofoles to obtain benefits from such loans without having to finance them until maturity. Furthermore, securitization enables them to transfer risks to intermediaries more specialized in risk management, such as Siefores, mutual funds, banks, insurance companies and foreign mutual funds. Thus, as of December 2006, the portfolio securitized by Sofoles accounted for 24 percent of their total mortgage portfolio (Box 19 and Box 20).

Graph 56
Interest Rate Spreads

a) Cost of Financing [1/] for Sofoles and Banks
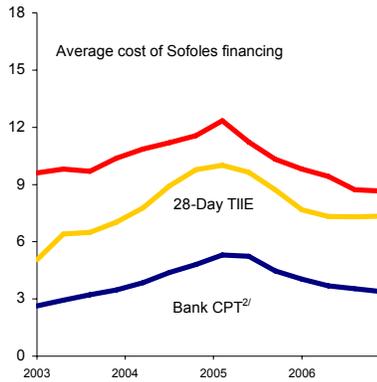
b) Spread between Mortgage Lending Rates[2/] and Sofoles' Average Cost of Funds
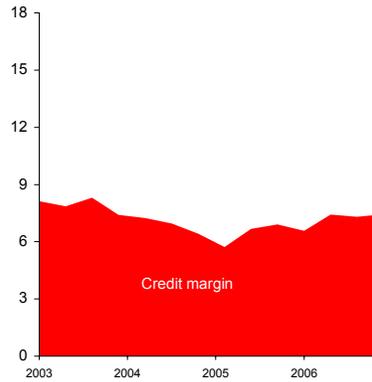
c) Spread between Mortgage Lending Rates[3/], the TIIE and Banks' Average Cost of Funds

Annual percentage

Percentage points

Percentage points
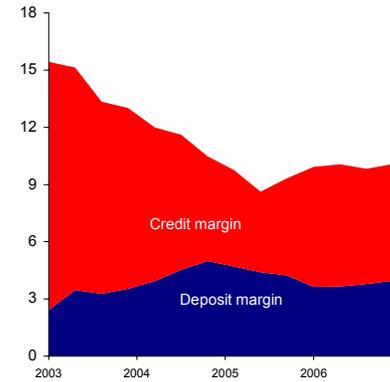
Figures at December 2006.
1/ Sofoles' total financing cost is the weighted average of interest rates on their security and bank liabilities and the rate which the SHF grants financing.
2/ Bank's Total Funding Cost (CPT).
3/ Average lending rates refer to the Total Annual Cost (CAT).
Source: Banco de México and CNBV.

6.2.2.   Solvency

Sofoles' main solvency indicators have improved in recent years. The return on equity ratio increased from 8.9 percent at the start of 2002 to 13.7 percent in December 2006. Meanwhile, non-performing loans have declined as a proportion of the total loan portfolio for most Sofoles, except those providing mortgage credit (Graph 57b), in which the delinquency rate has increased due to: i) the fact that these intermediaries' operation is focused on financing low cost housing, where default indexes are higher than in credit to medium cost and residential housing; ii) the maturity of their portfolios, which has now reached ten years; and iii) corrective measures ordered by the CNBV. In December 2006, the loan-loss reserves of mortgage Sofoles covered 45.5 percent of their non-performing loan portfolio, while this figure for non-mortgage Sofoles was 149.9 percent (Graph 57c). The difference results from the fact that the residual value of guarantees is higher in the mortgage portfolio and has loan guarantees from the Federal Mortgage Company (Sociedad Hipotecaria Federal, SHF).[112]

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[112] The SHF grants two types of debtor default guarantees: i) First Loss Guarantee (Garantía de Primera Pérdida), covering up to 25 percent of unpaid loans and, ii) Pari Passu Guarantee that covers 50 percent of loss after the property has been sold.

Graph 57
Solvency

a) Equity as a Proportion of Assets
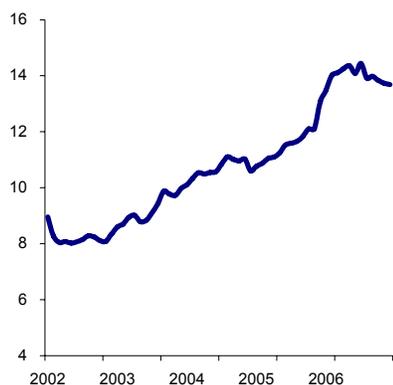
b) Non-performing loans as a Proportion of Total Portfolio

c) Loan Loss Reserves as a Proportion of Non-performing loan portfolio

Percent

Percent

Percent

Figures at December 2006.
Source: CNBV.
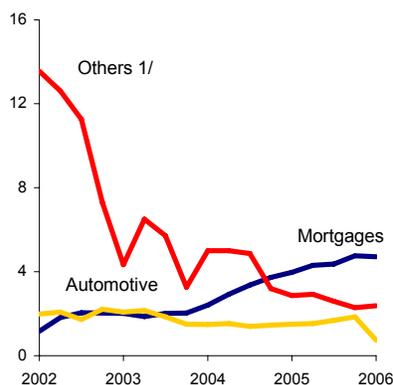
Figures at December 2006.
1/ Others: includes agricultural, firm and consumption Sofoles.
Source: CNBV.
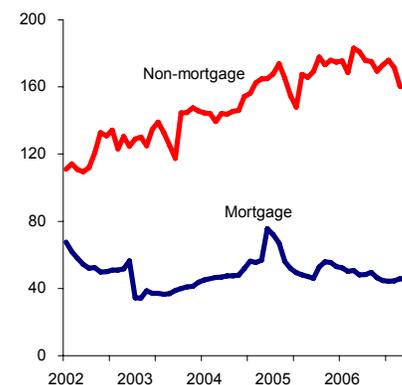
Figures at December 2006.
Source: CNBV.

6.2.3.   Concentration

The concentration of the mortgage credit market declined from 2002 to 2006 in response to an increase in the number of institutions in the market and reduced participation by the largest mortgage lenders. Similar behavior has been observed in the consumer financing market, given that the increased number of Sofoles specialized in this sector has fostered a decline in concentration indicators and higher portfolio dispersion (Table 16).

Table 16
Concentration Indicators for the Mortgage Credit Market[1]

	Sofoles		Banks		Sofoles and Banks	
	2002	2006	2002	2006	2002	2006
Number of firms	17	18	15	15	32	33
Market share: 2 largest	49	44	67	60	40	42
Market share: 4 largest	72	67	92	81	57	53

Concentration Indicators for the Consumer Credit Market[1]

	Sofoles		Banks		Sofoles and Banks	
	2002	2006	2002	2006	2002	2006
Number of firms	6	13	19	22	25	35
Market share: 2 largest	96	73	59	54	42	47
Market share: 4 largest	98	80	81	79	73	68

Figures at December 2006.
1/ Market shares are expressed as percentages of the total performing loan portfolio.
Source: CNBV.

Box 19

Securitization of Mortgage Assets in Mexico

In recent years, several mortgage Sofoles (with the Federal Mortgage Company's support) and Infonavit have securitized part of their mortgage portfolios, increasing their sources of funds and transferring risks to capital markets and institutional investors. Securitization is carried out as follows: the mortgage originator transfers assets to a trust fund, which then issues Mortgage Backed Securities (MBS). The MBS flows stem from the payments generated by the package of individual mortgages held in the trust fund.

At December 2006, Mexico's MBS market was as follows:

• 11.2 billion pesos in Mortgage Backed Securities issued by Infonavit (Certificados de Vivienda, Cedevis). Such certificates consist of approximately one billion pesos at maturities close to 20 years.

• 18.7 thousand million pesos in Mortgage Backed Securities (Bonos Respaldados por Hipotecas, Borhis) mainly issued by Sofoles. Borhis are issued in amounts of between 500 million and 2 billion pesos and at maturities of around 30 years.

Mortgage Backed Securities
Accumulated Stock in billion pesos

Source: Infonavit and SHF

The infrastructure necessary for a MBS market has been developed in Mexico over the last few years. Such infrastructure consists of: i) legal and regulatory framework, ii) standardization in credit processes, and iii) incentives for market investors and participants. The infrastructure has enabled MBS to increase their liquidity, which has been reflected in a reduction in the spread between the average yields of Borhis and government securities from 1.9 percent at the end of 2004 to 1.0 percent at the end of 2006. Besides individual mortgages, Sofoles can also securitize loans granted to housing developers. The stock of assets backed securities represented around 22 percent of Sofoles' total portfolio, despite the fact that only seven of the 19 mortgage Sofoles have gone through asset securitization.

**Securitizations carried out by Mortgage Sofoles***

Source: Banco de México
*"Securitization" refers to securities' market value. Includes loans to developers and individual mortgage portfolio securitizations with and without SHF support.

Unlike Sofoles, commercial banks have not been an active participant in mortgage securitizations due to the fact that their cost of funds is lower than that of the Sofoles and that their mortgage portfolio still does not represent a significant part of their assets. Nevertheless, as the mortgage market continues to develop in Mexico and the share of mortgages in bank portfolios increases, these will become more sensitive to the risk associated with mortgages, meaning banks will have to rely more on securitization[1]. Despite the fact that banks do not generally charge commissions for prepayment, mortgage prepayment is still not significant in Mexico, for the following reasons:

• Fees for taking out a mortgage and other refinancing costs, such as Notaries and property registration are high.
• The bank granting the new mortgages normally re-evaluates the borrower and the property, a process which in practice can take several weeks.

Holders of Borhis and Cedevis
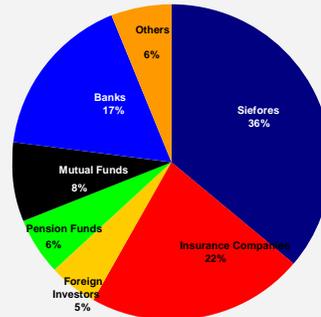
Among the holders of mortgage backed certificates Siefores stand out, holding 44 percent of Cedevis and 28 percent of Borhis.

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[1] During December 2006, Banorte was the first commercial bank to securitize mortgage portfolio for 2 billion pesos.

Box 20

The Federal Mortgage Company and Mortgage Securitization

The Federal Mortgage Company (Sociedad Hipotecaria Federal, SHF) was founded in 2001 with the aim of developing primary and secondary mortgage markets. The SHF has also funded Sofoles to provide mortgage credit. Nevertheless, in accordance with its governing law, the SHF must cease to grant loans as of October 2009. Since its creation, the SHF has worked to develop alternative financing mechanisms for financial institutions that grant mortgage credits. Portfolio securitization is one of the most efficient mechanisms that allow creditors to obtain funds to grant more loans. Development of an active mortgage securitization market requires:

- A pool of mortgages originated and administered according to international best practices. The SHF has established minimum origination and administration guidelines which institutions receiving financing from the SHF must fulfill.

- Securitization structures with mechanisms to offset risks. The SHF has granted two types of guarantees: i) Mortgage Credit Insurance or Default Guarantee (Garantía por Incumplimiento, GPI), which covers up to 35 percent of the initial loss for each mortgage, and ii) Partial Financial Guarantees or Timely Payment Guarantee (Garantía de Pago Oportuno, GPO) to issuers of securities who fulfill certain criteria.

- Investors with long-term horizons. The SHF has increased the liquidity of Borhis by participating directly in the secondary market and through the creation of Market Makers.

- Efficient mechanisms allowing continuous portfolio origination in order to reduce risks for those granting and administering credits.

The development of the mortgage backed securities (MBS) market has enabled some Sofoles to securitize their portfolio directly and allowed others to act as securitization pools purchasing mortgages from smaller Sofoles to further securitize them. The MBS that comply with the SHF requirements and charter are called Borhis, literally mortgage backed securities in Spanish.

To support the development of efficient portfolio origination mechanisms and make securitization easier for small and medium sized lenders, a company called the Hipotecaria Total (HiTo) was set up with the participation of the SHF. HiTo's purpose is to provide the market with a platform that enables integrated link-up between the creation of mortgage credits and capital markets so Borhis can be issued at the moment a mortgage is granted.

The HiTo model is based on the experience of Denmark. The development and technological aspects of the HiTo will therefore be carried out by the Danish Central Securities Depository, *Værdipapircentralen* (VP).

Some of the benefits expected from the HiTo are:

- A reduction in the time between loan placement and securitization, decreasing the costs and risks inherent in Borhis issuance.

- Direct continuous access to capital markets for lenders.

- More active participation of small and medium sized financial intermediaries in the mortgage market.

- Larger Borhis than those currently issued in order to foster market depth and liquidity.

- An interest rate stated at the moment of credit portfolio securitization, which will eliminate the market risk currently faced by lenders due to the time that runs between the placement of a credit and its securitization (which can be up to 28 months).
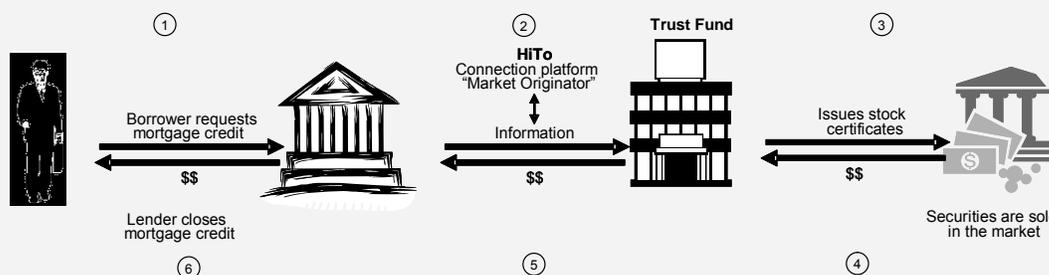
6.2.4.   Amendments to the legal framework

In order to increase competition in credit markets and eliminate unnecessary regulatory burdens, in November 2005 and July 2006, several changes were published in the Credit Institutions Law and the laws that regulate the activities of financial intermediaries which do not receive deposits from the public, such as financial leasing companies, financial factoring companies and Sofoles.

The aim of the 2005 reforms was to allow any entity to grant loans using funds obtained from placing securities in the stock market. Prior to this reform, the Credit Institutions Law reserved funding from the public (deposits or securities) for loan granting purposes to chartered and regulated financial institutions. This situation led to diverse legal interpretations regarding extended business and financial practices. For instance, business establishments commonly sell their products and services on credit, as well as granting various types of financing to their providers. Some of these companies also tend to finance themselves in the capital market. Likewise, any credit portfolio securitization through a specialized vehicle simultaneously implies the issuance of securities on the securities market and the granting of financing. The reforms made to the Credit Institutions Law in 2005 enable any entity to collect funds from instruments registered in the National Securities Registry for granting any kind of credit.

The reforms announced in July 2006 were aimed at reducing the regulatory burden on those financial institutions which cannot to receive deposits directly from the public and do not have any shareholder link with credit institutions (Box 21).

Box 21

Sofom linked with a bank

The General Organizations and Auxiliary Credit Activities Law establishes that a Sofom (Sociedad financiera de objeto múltiple) should be regulated when it belongs to a bank or when it has common shareholders with a bank or a financial group holding company owning a bank.

The same Law considers that a Sofom has links with a bank and thus should be regulated if any of the following are true:

1. The financial group holding company owns a bank and participates in a Sofom's capital.
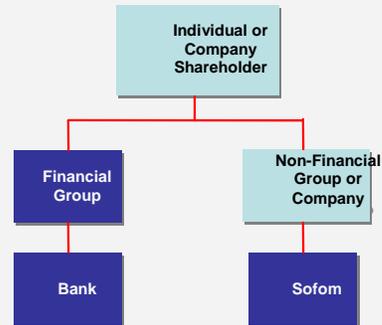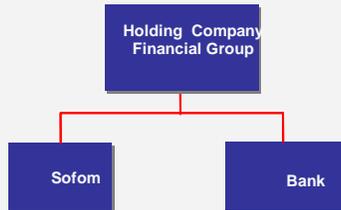
2. The Sofom is controlled by a bank.

3. The Sofom and a bank have direct or indirect common shareholders.

It is considered that a bank controls a Sofom when the bank:

i) Owns 20 percent or more of a Sofom's shares, or

ii) controls shareholder meetings, or

iii) has the ability to name most of the Board, or

iv) controls the Sofom by any other means.

Common shareholders means a person or group of persons which have agreements of any kind to make decisions in the same vein, and that:

i) directly or indirectly maintain a majority share in the social capital of the Sofom and the bank, or

ii) can control of the society and the institution.

■ Regulated entities   ▢ Non-regulated

The deregulation established the following:

i) Financial leasing and factoring activities were included in the General Law of Credit Operations and Securities (Ley General de Títulos y

Operaciones de Crédito), enabling them to be carried out by any individual.

ii)   The General Law of Auxiliary Credit Organizations and Activities (Ley General de Organizaciones y Actividades Auxiliares del Crédito, or LGOAAC) allowed for the creation of a new type of financial entity known as multiple purpose non-bank banks (sociedades financieras de objeto múltiple, or Sofomes). These new financial institutions can be set up without authorization from any financial authority, but their statutes must state the granting of loans, financial leasing activities, or factoring operations as their main objective. In order to differentiate between regulated and non-regulated Sofomes, the name must be followed by the letters E.N.R. (Entidad No Regulada, Non-Regulated Entity) or E.R. (Entidad Regulada, Regulated Entity).

iii)   In order for Sofomes to receive the fiscal benefits provided by laws governing Mexican financial system participants, their activities must mainly be focused on granting credit, financial leasing, and factoring.[113] Likewise, the LGOAAC grants them the same process benefits as financial leasing companies, factoring companies and authorized Sofoles.

iv)   When a company is set up as a Sofome, it must notify the National Commission for the Protection and Defense of Financial Service Users (Condusef) in order for any dispute between such institutions and their customers to be taken before the commission.

Currently operating Sofoles, financial leasing, and factoring companies have been given a maximum of seven years to migrate to a Sofomes regime, a time during which authorized financial institutions and Sofomes will coexist. Amendments to the legal framework are expected to reduce market participants' regulatory costs and enable new institutions to enter the market more easily. This should result in enhanced competition in the credit supply and, therefore, in lower interest rates for borrowers. Nevertheless, the regulatory changes do imply certain risks to which financial authorities must pay attention and, if necessary, regulate. Among these risks is the fact that, although the legal framework states that Sofomes linked to a bank must be regulated, it is difficult to identify the connection, given that a Sofome can be set up without previous notification to financial authorities.

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[113] Article 8 of the Income Tax Law considers that an institution is mainly dedicated to such activities when accounts or documents due for settlement and derived from such operations account for 70 percent of total assets, or when 70 percent of revenues come from such activities.

7.   Payment Systems

The following section briefly describes the evolution of large value payment systems in Mexico and summarizes Banco de México's main payment system activities.

7.1.   Description and evolution of Mexico's payment systems

According to the BIS, a payment system is a group of instruments, bank procedures and in general, interbank fund transfer systems which ensure money circulation. International practices define two types of payment system: large value[114] and low value.[115] The total amount of payments carried out in low value systems is relatively small and, consequently, any problems that might appear in their operations do not put the financial system at risk. This section, therefore, only covers large value payment systems.

There are three large value payment systems in Mexico: the Banco de México Account Holders Service System (Sistema de Atención a Cuentahabientes de Banco de México, or SIAC-Banxico), the Electronic Interbank Payment System (Sistema de Pagos Electrónicos Interbancarios, or SPEI), and the Interactive Security Deposit System (Sistema Interactivo para el Depósito de Valores, or SIDV). The average daily amount settled through these three systems totals around 2.3 trillion pesos, which means the systems process operations for a value similar to Mexico's annual GDP in less than four days (Graph 58a). Operations carried out via the SIDV account for 77.9 percent of this total; the SPEI system, 17.9 percent, and the SIAC, 4.2 percent.

7.1.1.   Banco de México Account Holders Service System (SIAC-Banxico)

SIAC-Banxico is the system Banco de México uses to administer the current accounts financial institutions hold at the central bank. The system's main function is to provide the payment system with liquidity. SIAC processes fund transfers between financial institutions and receives settlements from the SPEI system, the SIDV system, the liquidity repo system (Sistema de Reportos de Liquidez, or RSP), and the check compensation house, as well as several other low value houses. SIAC's main users are banks and brokerage houses.[116] The number of operations carried out via SIAC has remained constant at around 1,000 transfers per day for the last few years (Graph 58b). Nonetheless, during the last year the value of such transactions has risen to a daily average of around 110 billion pesos due to liquidity flows transferred to this system from and towards other systems and the RSP.

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[114] Used mainly to settle financial market operations, obligations generated in other payment systems and other obligations between financial intermediaries. These systems usually deal with large value payments which are normally settled instantaneously.

[115] Used by firms and individuals to make business, wage and other less urgent payments or payments that can be pre-programmed. Settlement of payments through such systems is normally deferred.

[116] The Federal Treasury Department and several public sector entities also make payments through the SIAC for considerable amounts.

### 7.1.2. Electronic Interbank Payment System (SPEI)

This system was designed and developed by Banco de México in compliance with guidelines set out in the Core Principles for Systemically Important Payment Systems (Principios Básicos para Sistemas de Pagos de Importancia Sistémica, Box 23). SPEI processes fund transfer orders between financial institutions and their customers instantaneously. Every participating institution has a money account where it can deposit payments from other participants or with its own resources transferred from SIAC or SIDV. Overdrafts are not allowed in the accounts, and at the end of the day balances are transferred to each participating institution's current account in the SIAC system.

The SPEI system, which is operated by Banco de México, came into use in 2004 and replaced the Extended Electronic Payment System (Sistema de Pagos Electrónicos de Uso Ampliado, or SPEUA) which had been operating since 1995. During 2006, the number of operations settled via SPEI each month has tripled and is currently around five times more than the operations that were processed via SPEUA during the last few years of its operations (Table 17). The most important factors contributing to the increase are: i) the system allows payments for any amount[117]; ii) some banks have automized their payment processes, promoted internet payment services and generally reduced the fees they charge for such operations; and iii) non-bank financial intermediaries have been allowed to participate.

Graph 58
Volume of Large Value Payment Systems

a) Average Daily Value of SPEI Operations | b) Average Daily SIAC Operations | c) Average Daily SIDV Operations
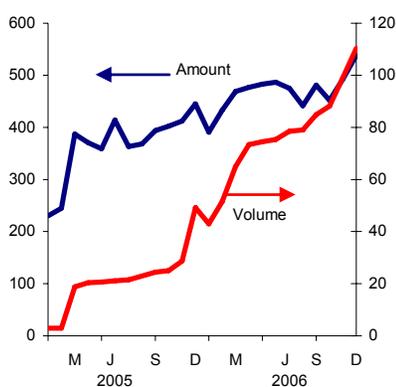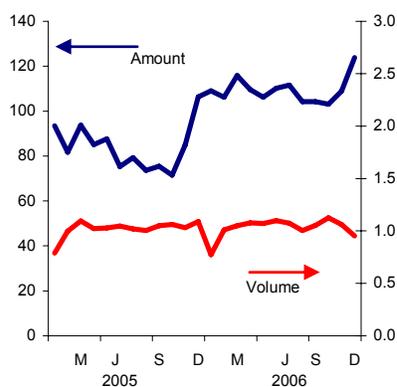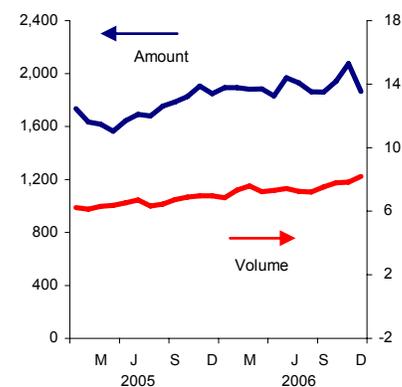
Figures at December 2006.
Source: Banco de México.

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[117] Payments under 50,000 pesos were not allowed in SPEUA.

Table 17
SPEI
Number of operations

2006	Under 50 thousand pesos	50 thousand pesos and over	Total
January	399,067	550,360	949,427
February	448,655	533,944	982,599
March	784,492	648,810	1,433,302
April	788,420	537,160	1,325,580
May	985,859	656,773	1,642,632
June	1,004,874	659,045	1,663,919
July	1,024,605	632,802	1,657,407
August	1,137,845	683,465	1,821,310
September	1,120,051	670,945	1,790,996
October	1,233,905	712,492	1,946,397

Source: Banco de México.

7.1.3.   Interactive Security Deposit System (SIDV)

Securities operations carried out in debt and capital markets are settled via the SIDV system. Users of this system are banks, brokerage houses, investment funds, insurance companies, and other financial institutions. Brokerage houses and banks that participate in SIDV have an account which they use to settle their operations and transfer funds to and from the SIAC and SPEI systems. The settlement system implicit in the SIDV is based on a "payment on delivery" model. Under this scheme, the definitive transfer of both securities and funds is made simultaneously based on net amounts at the end of each settlement cycle. Given the extremely short frequency of settlement cycles (15 minutes), low level risks accumulate in the SIDV system. Any operations that are not sterilized during a cycle remain in the system to be processed in later cycles. Since January 2005, SIDV stopped granting credit to its participants and, as a result, they must now have the resources in their accounts needed to settle operations that imply cash movements.

Almost 80 percent of the total value of operations carried out in payment systems in Mexico are settled via SIDV. Most of this amount corresponds to money market operations, the most important of which correspond to securities issued by the federal government, IPAB, and Banco de México. Operations via this system have grown very rapidly during recent years. SIDV was developed and is operated by the Securities Deposit Institution (Institución para el Depósito de Valores, Indeval), a company which provides a central securities deposit service in Mexico.

7.2.   Banco de México's role in the payment systems

The central bank fulfills several functions in the payment system: i) it is an important participant given that it implements monetary policy through the system; ii) it operates the SPEI and the SIAC systems; iii) it provides liquidity to the payment system, and iv) it promotes, regulates, and oversees the operation of the payment systems. To perform these activities Banco de México has a program of continuous payment system reform and update. In particular, during recent

years it has taken various measures to reduce risks, encourage secure and efficient systems, and improve competition between financial institutions.

7.2.1. Credit in the Payment System

Since 2004, Banco de México has taken various measures to reduce the credit risk it faces when providing liquidity to the payment system. To this end, credit in SIDV was eliminated, the SPEUA system was replaced by SPEI,[118] and the rules and procedures for granting liquidity during the day and at different terms were modified and a repo module was introduced to SIAC-Banxico in order to provide payment systems with liquidity (RSP).[119] Payment system participants currently obtain a significant part of the resources they need to settlle operations from the RSP. On average, over 212 billion pesos of credit is granted to the system via the RSP on a daily basis (Graph 59).

Graph 59
Central Bank Liquidity
Liquidity Provision to Payment Systems through the RSP

Billion pesos
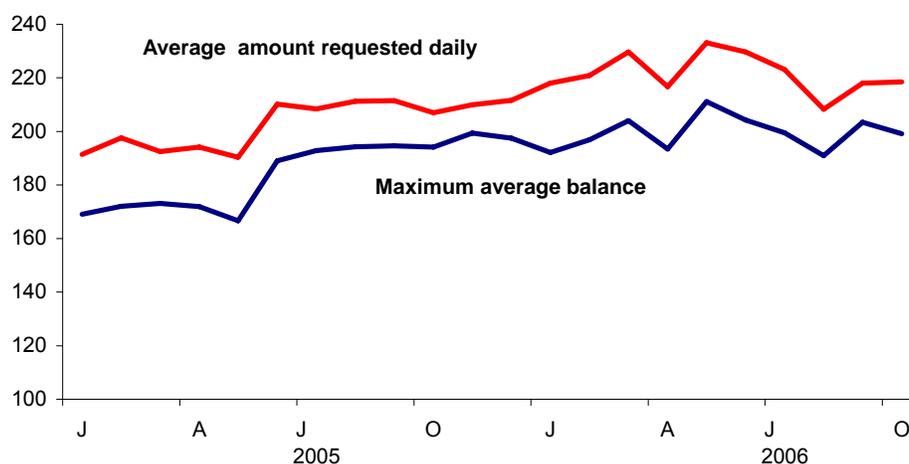
Figures at December 2006.
Source: Banco de México.

Banks can also obtain liquidity during the day using the overdraft facility at their current accounts in Banco de México, but only if they provide guarantees with instruments such as Monetary Regulation Deposits[120] for a higher amount than the overdraft. The maximum overdraft is also limited according to bank capital.

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[118] SPEUA participants granted each other credit lines that were guaranteed by Banco de México. SPEI operates without credit lines.

[119] Participants transfer securities via repo operations through the RSP to Banco de México. The repo's maximum maturity is at the end of the day. Banks can operate directly with Banco de México, while brokerage houses must use a bank. RSP only accepts securities with secondary market issued in Mexico by the federal government, IPAB, or Banco de México. The amount of resources that banks and brokerage houses can obtain through RSP is limited.

[120] Cash deposits that banks hold in Banco de México.

113

7.2.2.　　　Update of the SIDV

Under the provisions of the Payment System Law (Box 22), Banco de México is actively working with the company operating the system to update SIDV, which has become obsolete vis-à-vis international best practices for this type of system.[121] Design and development processes for the new deposit and security settlement system began in 2004.

7.2.3.　　　Payment System Opening

At the end of 2005, Banco de México decided to authorize non-bank financial institutions' participation in payment system operations in order to encourage competition between financial institutions and improve the quality of the payment systems offered to customers. Banco de México expects this action to improve competition among financial institutions and the quality of the services they offer.

Box 22

Payment Systems Law

In 2002, Congress approved the Payment Systems Law (Ley de Sistemas de Pagos, LSP) which establishes the legal framework for systemically important payment systems. The Law gives Banco de México wide powers to ensure such systems function correctly as well as to design and implement correction programs to eliminate irregularities which could affect their function or threaten the security of fund transfer orders that are processed in such systems.

Under the LSP, payment systems must fulfill the following: the direct or indirect participation of at least three financial institutions, and settlement or clearing of an average monthly amount equal to or higher than 100 billion Udis per calendar year. The payment systems administered by Banco de México are also included.

Mexico's three large value systems, the SPEI, the SIAC and the SDIV fulfill the these requirements and are therefore considered of systemic importance.

The LSP has fostered a reduction in the systems users' legal risks by establishing precise rules on the legal validity of clearing and settlement, as well as on the enforceability of collateral offered by participants to ensure their obligations are met. Regulation also specifies that operations settled in such systems are definitive and irrevocable. Furthermore, collateral deposited in the systems cannot be subject to seizure or expropriation.

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[121] "Recommendations for Securities Settlement Systems." Committee on Payment and Settlement Systems (CPSS), Technical Committee of the International Organization of Securities Commissions (IOSCO), November 2001.

Box 23

Core Principles for Systemically Important Payment Systems

In 1990, the governors of G10 countries' central banks set up the Committee on Payment and Settlement Systems (CPSS), which is a forum for central banks to monitor the development of domestic and cross-border payment, settlement and clearing systems. The CPSS publishes studies providing guidelines and recommendations on central banks oversight of payment systems.

One of the most important contributions of the CPSS has been the publication of the Core Principles for Systemically Important Payment Systems. In 1998 a CPSS working group, in which Banco de México participated, defined the principles that should govern the design and operation of systemically important payment systems i.e. those that can generate systemic risk. The study was finally published in 2001 and provides ten core principles and four responsibilities that central banks must consider when implementing these principles. The principles contain the fundamental characteristics that payment systems should satisfy and are written in a general manner to allow their implementation and permanence in countries at any stage of development.

Core principles:
I. The system should have a well-founded legal basis under all relevant jurisdictions.

II. The system's rules and procedures should enable participants to have a clear understanding of the system's impact on each of the financial risks they incur through participation in it.

III. The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants, and which provide appropriate incentives to manage and contain those risks.

IV. The system should provide prompt final settlement on the date value, preferably during the day and at a minimum at the end of the day.

V. A system in which multilateral settlement takes place should, at least, be capable of ensuring the timely clearing of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.

VI. Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk.

VII. The system should ensure a high degree of safety and operational reliability and have contingency arrangements for timely completion of daily processing.

VIII. The system should provide a means of making payments which is practical for its users and efficient for the economy.

IX. The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.

X. The system's governance arrangements should be effective, accountable and transparent.

Responsibilities of the central bank in applying the core principles:
A. The central bank should define clearly its payment system objectives and should disclose publicly its role and major policies with respect to systemically important payment systems.

B. The central bank should ensure that the systems it operates comply with the core principles.

C. The central bank should oversee compliance with the core principles by systems it does not operate and it should have the ability to carry out this oversight.

D. The central bank, in promoting payment system safety and efficiency through the core principles, should cooperate with other central banks and with any other relevant domestic or foreign authorities.

8. Conclusions

The expansion of the Mexican financial system during 2006 took place in the context of a favorable financial environment. Throughout this year, the world economy recorded robust growth and, despite the high prices of oil and other commodities, inflation expectations remained well anchored. The gradual rise in interest rates induced by industrialized countries' central banks did not have important repercussions in financial markets. Periods of volatility were shortlived and did not affect emerging economies' access to international capital markets, nor did they have important implications for inflation expectations and economic growth in most of these countries.

Although Mexico's economy recorded significant growth during 2006, the expansion began to show signs of slowing in the second half of the year. The strength of output together with macroeconomic stability have been important factors driving private sector saving. Regarding the use of financial resources, the public sector continued to reduce its debt during 2006. In partiular, despite the expansion of public expenditure, public sector borrowing requirements declined substantially due to an incease in oil revenues and a fall in the cost of the sector´s debt financing. These improvements freed up a significant amount of resources for financing to the private sector. The factors contributed to a significant rise in bank financing to households, which has been reflected in an increase of debt service measured as a proportion of income, although this remains at levels lower than in other more developed countries. Firms have also benefitted from a greater availability of domestic resources, allowing them to reduce external indebtedness as a proportion of production. The latter has also been made possible by the growing importance of placing debt instruments in the Mexican market as a source of financing for firms.

Regarding the development of financial markets, the federal government's strategy has included replacing foreign currency denominated liabilities with peso denominated debt, issuing fixed rate instead of variable or indexed rate bonds and extending maturity terms. Meanwhile, secondary debt markets have continued to consolidate, leading to the increased liquidity of securities. The increased participation of both foreign and domestic investment institutions in debt markets was significant, while the volume of peso/dollar operations in foreign exchange markets has placed the peso among the ten most traded currencies in the world. This situation has led to more symetrical exchange rate behavior as well as an important reduction in volatility.The need to manage the risks inherent in a floating exchange rate regime and a long term debt market has fostered the develpment of exchange traded and OTC derivatives markets in Mexico. These markets complement each other, and they have developed in parallel, which has in turn led to the rapid growth of the operated volume of interest rate based instruments.

Commercial banks are the system's most important financial intermediaries, and are highly concentrated. In 2006, the six largest banks' net profits increased considerably compared to the previous year, while their average profitability, measured as a proportion of equity (ROE), was 24.6 percent (weighted by the size of assets). The rise in bank profitability can be attributed to

three factors: the growth of credit, balance sheet improvement, and the population's greater use of banking services. From the level of net interest income measured as a proportion of assets, it is possible to infer that the spread between lending and deposit interest rates remains high in Mexico. Commercial bank revenues from commissions and fees continued to grow, mainly in response to increased use of banking services.

As for bank solvency, the rise observed in capitalization and reserves as a proportion of non-performing loan portfolios is noteworthy. The analysis of credit and market risk for the six largest banks showed that their capitalization and profit levels are sufficient to withstand expected and unexpected losses that arise during normal economic conditions. The robust growth of the portfolio associated with credit cards has been accompanied by a significant increase in non-performing loans. The latter mainly responds to various banks' strategies to penetrate high risk sectors, which in many cases have no credit history. The behavior of such a portfolio should be carefully monitored by commercial banks. Bankarization processes always imply more risk, and it is therefore essential that banks achieve a proper balance between growth and risk which enables them to continue advances in this important area.

Changes observed in the sructure of the main banks' balances during recent years have also implied a considerable decline in liquidity risk in cases where liquid assets have increased and are higher than less stable or permanent assets. Furthermore, a study of interbank risk positions reveals that, although there is a danger of contagion, in the present situation it is highly unlikely it would result in systemic problems. The previous paragraphs have shown how the expansion of the banking system is taking place on solid foundations and that the appearance of instablity risks is therefore remote.

Analysis of the intensity of competition between banks in different market segments reveals important contrasts. While banks appear to be competing more in the area of mortgage credit, as seen in the decline of mortgage interest rates, it would seem that competition in the consumer credit market is lower. In particular, in some segments, such as the credit card market, competition is carried out through product differentiation. In this context, Banco de México has adopted various measures aimed at encouraging transparency, reducing barriers to entry, eliminating discriminatory practices, establishing price determination policies associated with network use, and protecting consumer interests.

The relative importance of other financial intermediaries such as Afores and Sofoles has increased considerably in recent years. Regarding Afores, reforms introduced in recent years have facilitated the entrance of new retirement fund administrators to the market. Although the profitability of Afores has recorded a downward trend in line with increased competition, this performance responds more to increased expenditure on publicity than to lower commissions. The reforms have also led to an improvement in the diversification of Siefores portfolios into instruments offering higher yields. The recent reforms to the Retirement Savings System Law approved by Congress, which among other measures eliminates commissions charged on flows, will contribute to increased competition among Afores.

The robust growth of Sofoles has been significant, especially in the mortgage and automobile sectors. However, more recently, these intermediaries have lost relative importance due to commercial banks' purchase of several mortgage Sofoles, the recovery of bank financing to households, and banks' purchase of Sofoles mortgage portfolios. The option to securitize their assets has allowed Sofoles to transfer balance sheet risks to other intermediaries and concentrate on the creation of loans. Finally, in 2006, Congress passed the federal executive's initiative to increase the flexibility of the legal framework governing these itermediaries in order to increase competition in the granting of loans and eliminate unnecesary regulatory burdens. As part of these reforms, multiple purpose non-bank banks, or Sofomes, were set up.

Payment systems have grown in both overall volume and number of transactions. Recent reforms in this area have focused on fostering competition, encouraging the use of efficient means of payment, and reducing the risks faced by users and Banco de México. In this vein, the central bank granted non-bank financial institutions direct access to the SPEI system in order to improve service quality and effiiency. Furthermore, credit risks faced by users and Banco de México have been reduced by the establishment of the obligation that all liquidity credits received by banks to settle their operations at Banco de México must be completely guaranteed.

The best contribution Banco de Mexico can make to the sound development of the financial system is to ensure price stability, a factor which is indispensable to macroeconomic stability. Banco de México will continue to encourage measures designed to improve the efficiency of financial markets and payment systems. It will also continue to promote transparency and information on interest rates and bank commissions. The ultimate goal is to enable a greater range of improved financial products to reach the Mexican population at more accessible prices and, thereby, foster bancarization.

9. Abbreviations

Afores   *Administradoras de Fondos para el Retiro;* institutions responsible for collecting and managing the retirement funds of Mexican workers, also called Pension Fund Managers or Retirement Fund Administrators.

Brems   *Bonos de Regulación Monetaria;* Monetary Regulation Notes.

Bondes   *Bonos de Desarrollo del Gobierno Federal;* Federal Government Development Bonds.

Borhis   *Bonos Respaldados por Hipotecas*; Mortgage Backed Securities (MBS).

Cedevis   *Certificados de Vivienda* issued by Infonavit; Mortgage Backed Securities (MBS) issued by Infonavit.

Cetes   *Certificados de la Tesorería*; Treasury Certificates.

CNBV   *Comisión Nacional Bancaria y de Valores;* the National Commission on Banking and Securities.

CNSF   *Comisión Nacional de Seguros y Fianzas*; the National Commission for Insurance and Bail Companies.

Condusef   *Comisión Nacional para la Protección y Defensa de los Usuarios de los Servicios Financieros;* the National Commission for the Protection and Defense of Users of Financial Services.

Consar   *Comisión Nacional del Sistema de Ahorro para el Retiro;* the National Commission for the Retirement Savings System.

Fovissste   *Fondo de la Vivienda del Instituto de Servicios de Seguridad Social para los Trabajadores del Estado*; the Mortgage Fund for ISSSTE's Affiliated Workers

ICAP   *Índice de Capitalización*; the Capital Adequacy Index.

IMSS   *Instituto Mexicano del Seguro Social*; the Mexican Institute for Social Security.

Infonavit   *Instituto del Fondo Nacional de la Vivienda para los Trabajadores*; the National Fund for Workers' Housing Institute.

IPAB   *Instituto para la Protección del Ahorro Bancario*; the Bank Deposit Insurance Institute.

ISSSTE   *Instituto de Servicios de Seguridad Social para los Trabajadores del Estado;* the Institute for Social Security for Government Workers.

MexDer   *Mercado Mexicano de Derivados*; the Derivatives Market

SAR   *Sistema de Ahorro para el Retiro*; the Retirement Savings System.

SHCP   *Secretaría de Hacienda y Crédito Público*; the Ministry of Finance and Public Credit.

SHF   S*ociedad Hipotecaria Federal*; the Federal Mortgage Company.

Siefores   *Sociedades de Inversión Especializadas de Fondos para el Retiro*; mutual funds that are responsible for the investment of the retirement funds collected by the Afores.

Sofoles   S*ociedades Financieras de Objeto Limitado;* non-bank-banks with limited allocation of credit to a single sector (mortgage, consumer credit, automotive, etc.)

Sofomes   *Sociedades Financieras de Objeto Múltiple*; non-bank-banks with multiple allocation of credit to different sectors.

TIIE   *Tasa de Interés Interbancaria de Equilibrio*; the Interbank Equilibrium Interest Rate