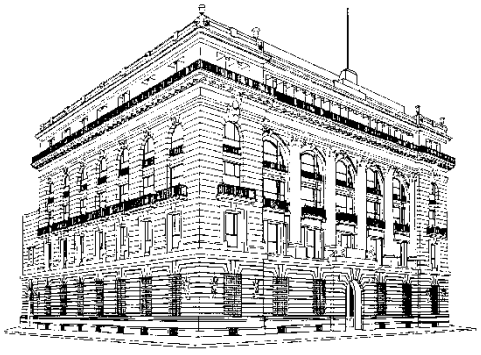
Financial System Report



BANCO DE MEXICO

July, 2009

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NOTICE

Unless otherwise specified, this document has been drafted using information available as at June 30, 2009. Figures are preliminary and may be revised.

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1. Introduction

This report covers the period from June 2008 to June 2009 during which the international financial crisis deepened and spread to virtually all countries and financial systems, becoming the biggest and most severe since the Second World War with an unprecedented impact in terms of the size of the losses incurred and the effect on economic activity and international trade.

The deepening of the international financial crisis, especially as of September 2008, has had major adverse effects on emerging economies, Mexico included. The slowdown in the pace of global economic activity along with lower commodity prices has significantly altered the terms of trade. Likewise, increased risk aversion and asset sell-offs by foreign investors have adversely impacted exchange rates, interest rates and the stock market indices of several emerging markets.

Due to the specific characteristics of the Mexican economy, some of these shocks have had especially negative consequences. For example, Mexico is highly dependent upon the United States for foreign trade —especially manufactured exports— and so the economic slowdown in the US has adversely affected the domestic economy.

The spread of the crisis through financial channels has driven up the cost of liquidity and capital in international markets and led to the adoption of stringent credit policies by banks worldwide affecting financial conditions for firms and households alike. Uncertainty generated by the disclosure of derivative-related losses by several major Mexican companies has also increased the cost of financing for domestic companies.

Economic activity has been further undermined by a series of concurrent events not necessarily related to the financial crisis itself. Prevailing concerns about security issues have continued to impact the business climate and the outbreak of Influenza A(H1N1) in the second quarter of 2009 caused additional economic damage. Furthermore, the restructuring of the US car sector led to the temporary closure of some plants in Mexico.

Despite this very unfavorable scenario, Mexican institutions and financial markets have remained relatively solid, reflecting how efforts made over the last ten years (following the 1995 crisis) to improve the legal framework, financial regulation and supervision, have borne fruit.

Recent data suggest that the contraction in global economic activity and international trade is hitting bottom with some countries showing signs of a modest recovery. Meanwhile the international financial system continues to stabilize and interbank interest rates are returning to levels similar to those prevailing before the outbreak of the financial crisis. At the same time institutional investors are restructuring their portfolios with leveraged funds seeking out riskier assets. This has been reflected in a rise in global stock market indices. Nevertheless, credit remains tight and liquidity conditions in

financial markets have not yet returned to pre-crisis levels. The size of the losses incurred by many financial institutions, along with de-leveraging, are set to make the global economic recovery a gradual process.

2. The International Financial Crisis

This section contains an overview of the origin and evolution of the international financial crisis and the main measures adopted by different countries to confront it. Throughout the text, emphasis is placed on the impact of the crisis on the Mexican economy and financial system.

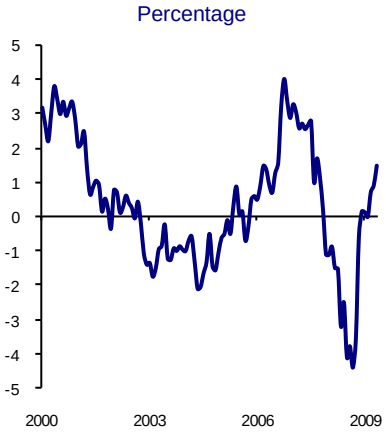
2.1. Origin

As most financial crises, the current one was preceded by an economic boom, mainly in developed countries, and more specifically in the United States. The previous period of economic expansion was characterized by high levels of household and company debt as well as unprecedented growth in the US housing sector. Early warning signs of the trouble ahead were manifested in mid-2006 by a rise in defaults on US subprime (low quality) mortgages. However, no one at the time could predict the scope or the severity of the current crisis. Below, the root causes and evolution of the crisis are discussed:

I. An extended period of low real and nominal interest rates and abundant liquidity in international financial markets favored by lax monetary and fiscal policies in the world's largest economy (Graphs 1a and b). This situation resulted in the financial risks assumed by economic agents being seriously underestimated, which encouraged asset leveraging and securitization.

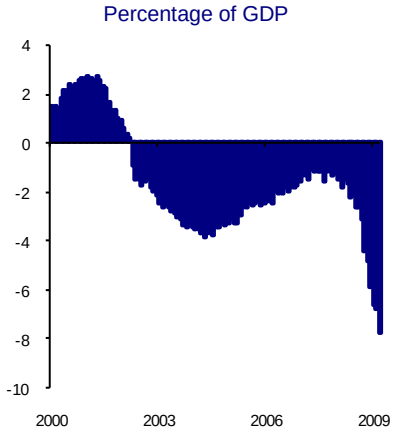
Graph 1
Interest Rate, Public Deficit and Leverage of US Banks

a) United States Federal Funds Real Interest Rate



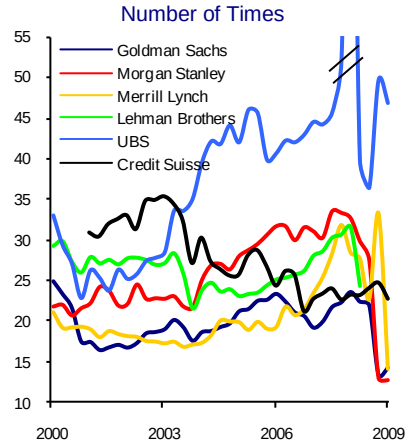
Figures as of May, 2009.
Source: Bloomberg.

b) United States Government Fiscal Deficit



Figures as of March, 2009.
Source: Bloomberg.

c) Assets to Equity Ratio



Figures as of March, 2009.
Source: Bloomberg.

II. A process biased towards market discipline in the absence of proper incentives for market functioning. Conflicts of interest among rating agencies1, a lack of transparency in terms of public information,

[1] The financial crisis has given rise to criticisms from diverse quarters of the role rating agencies played. They have a dual role: on the one hand they evaluate issuance risk while on the other they advise companies about the characteristics required for bonds to obtain better credit ratings. This dual role

inconsistencies in accounting rules and incentives related to the remuneration structure of those with decision-making powers at financial institutions contributed to weakening market discipline.[2]

III. Unprecedented leverage by financial intermediaries (Graph 1c), households and firms encouraged financial innovation and growth in off-balance-sheet financial intermediation on the part of traditional regulated entities. Banks and other financial institutions, especially in the United States, created investment vehicles for taking credit portfolios off their balance sheets thereby reducing their capital requirements. The securities issued through these vehicles were designed using characteristics which resulted in better credit ratings (Box 1). Rating agencies believed these securities would be adequately protected from a modest deterioration in the underlying assets because they consisted of portfolios with different risk profiles. However, the same rating agencies underestimated the exposure of securitized portfolios to common risks such as an across-the-board deterioration in house prices or household payment capacity. Securitization led to a significant expansion of credit and facilitated growth in "parallel" financial intermediation, outside of the usual regulated channels. Graph 1 shows how in the United States, the amount of "parallel" financial intermediation increased from 23.6 percent of GDP in 1986 to 44.6 percent in 2006.

creates conflicts of interest. Furthermore, doubts have been raised about the methodologies used by rating agencies to rate the credit quality of structured financial instruments.

[2] The remuneration structure of many financial entities usually rewards decisions which generate higher profits during a one-year period without regard to the potential risks incurred in the medium and long-terms in obtaining them. Likewise, public information usually emphasizes the profits made by financial entities but not the risks taken to achieve them.

Table 1
United States Financial Intermediation

	Percentage	
	1986	**2006**
Banks, Savings and Loans Entities and Credit Cooperatives	41.1	22.1
Insurance	12.5	10.5
Pension Funds	19.4	17.7
State Sponsored Companies [1/]	3.4	5.0
Total Traditional	**76.4**	**55.4**
Asset-Backed Security Issuers	6.0	14.1
Mutual Funds	7.4	18.3
Investment Banks	1.8	4.8
Others	8.4	7.4
Non Traditional Total	**23.6**	**44.6**
Total Financial Intermediation	100.0	100.0

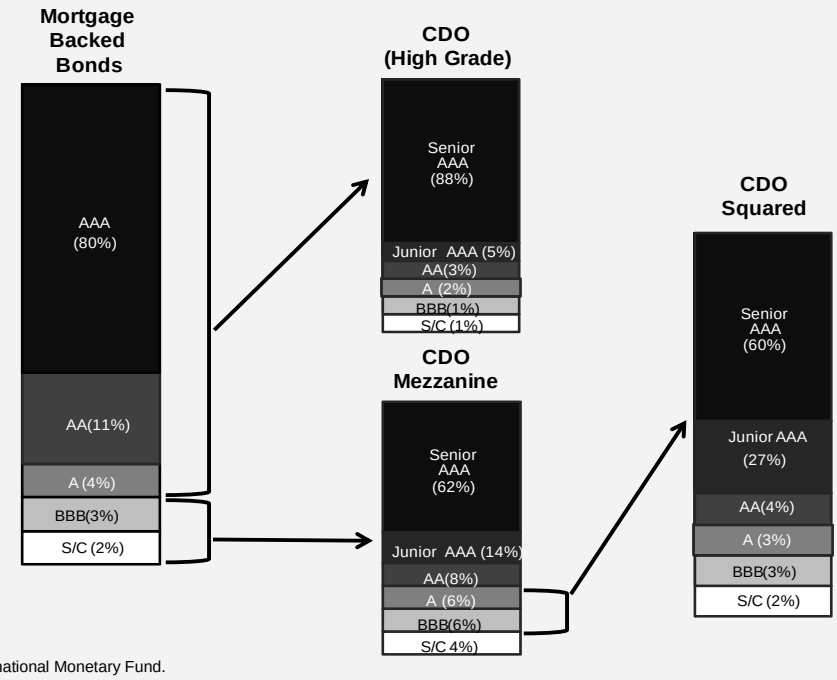
Source: Board of Governors Federal Reserve System. "*Flow of Funds Accounts of the United States*".
1/ Financial institutions providing credit to specific areas of the economy, such as the mortgage or agriculture sectors, in particular Federal Home Loan Banks, Freddie Mac and Fannie Mae.

IV. A lack of proper oversight of global financial entities owing to the complexity of their operations and multiple counterparties, as well as the excessive fragmentation in some countries of entities with regulatory powers, led to many of them taking too much risk. The crisis has also brought to the fore material weaknesses in the risk control and management processes of financial institutions themselves. Finally, it goes without saying that speculative bubbles invariably lead to financial fraud (Box 2).

Box 1

Asset Securitization

Diagram 1
CDO Structure



Source: International Monetary Fund.

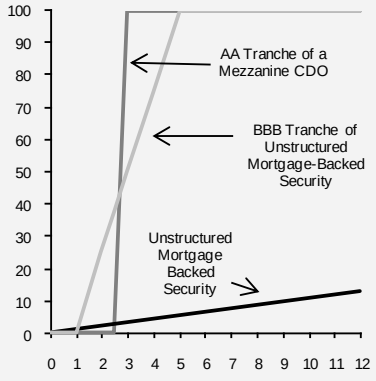
An Asset-backed bond gives its holder the rights to a portfolio of loans or financial assets which have been transferred to a special vehicle or trust; this procedure is known in Mexico as securitization. The bondholders have the right to receive the flow of payments from the securitized assets.

Asset-backed Bonds are often divided into tranches with different priority levels. The losses are absorbed first by the tranche with the lowest priority or highest degree of subordination. The division into tranches allows the more preferred bonds to receive a higher credit rating. Diagram 1 shows an example in which the most senior bonds (AAA) account for 80 percent of the total amount of certificates issued. The seniority of the AAA-rated bonds allows portfolio losses to be absorbed first by lower-rated certificates. The bonds with the highest priority are only affected when losses on the credit portfolio exceed 20 percent. In addition to seniority, there are other mechanisms for improving bond credit ratings. These include overcollateralization (when the principal underlying a pool of assets is often greater than the principal amount of the issued security) and credit insurance.

In order for Asset-Backed Bonds to be acquired by more institutional investors, like pension funds, the issuer may seek to improve its credit rating by packaging them into another vehicle that issues new bonds that are backed by some form of collateral (collateralized debt obligations, or CDOs), with certain features (seniority, insurance, and overcollateralization) that enabled them to obtain a higher credit rating. In the example shown in Diagram 1, Mortgage-Backed Bonds rated AAA, AA and A are packaged into a new vehicle, which in turn issues new CDOs. The latter are divided into tranches with six different levels of priority. The most senior securities (AAA) in its second structure account for 88 percent of the total.

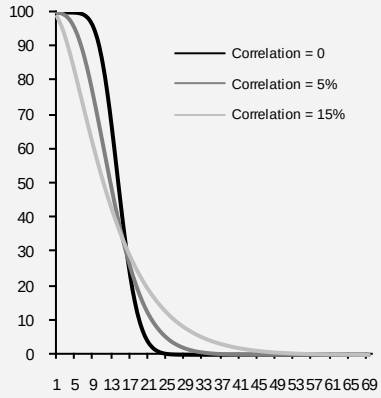
So packaging and re-packaging structured bounds allows the issuer to increase the proportion of high-grade securities. In the example in Diagram 1, the proportion of AAA-rated securities go from 80 percent to 86.7 percent of the total (88 percent of the AAA, AA, and A tranches of the original issue, plus 62 percent of the BBB-rated or unrated tranches of the same issue). But it can be very difficult to value a CDO, both because of the opacity of the underlying structures and because of the risks they entail. Furthermore, securities created through packaging and re-packaging of profiles often result in a much higher risk profile than the original securities. In Diagram 2, we see how losses on the underlying loan portfolio (horizontal axis) affect losses on the various securities issued (vertical axis).

Diagram 2
Loss Profile



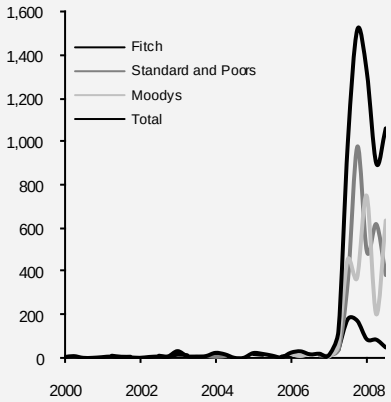
(Horizontal Axis: Percentage of Losses in Underlying Asset.
Vertical Axis: Percentage of losses on Certificate)
Source: RBA.

Diagram 3
Accrued Breakdown of Losses
Percent



Source: International Monetary Fund.

Diagram 4
Reduction in CDO Ratings[1]
Number of changes



1/ Based on changes by Fitch, Moody's and Standard and Poor's for securities in the U.S. market.
Source: Bloomberg.

The process used by rating agencies to assign ratings to structured instruments is based on the construction of probability distributions for the estimated losses on the underlying loan portfolios (Diagram 3). In mortgage portfolios, the distribution is built based on the estimated severity of the losses.

Correlations between defaults are another factor used in rating securities. Rating agencies make assumptions about the parameters that affect the severity of losses (value of the property, recovery rate, correlation between defaults), and through models, perform simulations in order to assign ratings.

The characteristics of the structures used to securitize assets (overcollateralization, seniority and insurance) are determined in keeping with the recommendations of the rating agencies themselves, and the models they use to establish credit ratings on the most preferred tranches. The results of these models are often highly sensitive to the assumptions used. A study by the International Monetary Fund concluded that when the correlation coefficient rises from 5 to 15 percent, in order for the senior tranche to be protected from the losses, the level of subordination must rise from 16 to 25.6 percent. According to Fitch, 60 percent of structured instruments had an AAA rating as of mid-2007, in contrast to one percent of corporate bonds.

Abrupt changes in the ratings of a large number of structured instruments starting in December 2008 (Diagram 4) raised doubts about how reliable these ratings were. The following are some of the reasons ventured for the poor performance of the rating agencies:

- Conflicts of interest: i) The bond issuers, not the investors, pay for the rating. ii) Rating agencies have two roles: they are both consultants and risk appraisal vendors.
- The level of sensitivity of the models used to evaluate complex financial instruments. For example, calculations by the Bank of England show that a small change in the hypotheses of the model typically used by banks to value mortgage-backed debt can lead to fluctuations of up to 35 percent in the implicit price of an asset rated low-risk.
- The use of similar classification systems for structured products and traditional bonds has led to some confusion, even though the methodologies used to calculate credit risk significantly differed.

  Furthermore, for each type of bond, the rating agencies used different scales with "idealized default rates" for each rating. This means that, for a given rating, the idealized default rate for a municipal bond is lower than the idealized default rate for an ABS, which, in turn, is lower than the rate for a CDO. For example, Nomura Securities shows that if an AA+ rated ABS is pooled, becoming a CDO, its rating will then become AAA because the CDO has a higher idealized default rate than the ABS.
- Ratings refer to a single element: credit risk. While agencies consider themselves responsible exclusively for assessing credit risk, investors expect ratings to cover all the implicit risks.
- Another risk that rating agencies encountered when appraising such complex instruments is operational risk. In 2006, experts from ABN AMRO designed an instrument called the Constant Proportion Debt Obligation, or CPDO. The idea was to create an AAA-grade instrument that offered yields 10 times higher than equivalent products. In the same year, Moody's and Standard and Poor's assigned it AAA ratings. In January 2007, however, it was discovered that the computer code Moody's used to rate the CPDOs had various errors.

  When the code was corrected, the default probability of the instruments rose substantially, so the rating had to be downgraded. Later, Moody's analysts corrected the error without notifying investors. The instruments kept their AAA rating because the code was modified to improve the credit rating.

Table 1
Effects of Changes in Parameters on CDOs and CDOs-Squared

			Final Rating					
		Initial Rating	Default correlation (ρ)			Default Probability (SP)		
		(ρ=20%, PI=5%)	40%	60%	80%	7.50%	10%	12.50%
CDO	Junior	NR1/	D	C	CC	NR	NR	NR
	Mezzanine	BBB-	BB-	B+	B+	B+	CCC	CC
	Senior	AAA	A+	BBB-	BB	AAA	A+	BBB-
CDO^2	Junior	C	D	NR	NR	NR	NR	NR
	Mezzanine	AAA	B+	C	CC	BBB-	NR	NR
	Senior	AAA	AAA	AAA	AA+	AAA	AAA	B-

1 NR: Not Rated.

Simulation of scenarios for a CDO:
To better illustrate the importance of the parameters used to assign a rating to structured instruments (correlation coefficient of underlying assets, default probability and recovery rate), we cite a recent work by Joshua D. Coval, Jakub Jurek, and Erik Stafford.[2]

These authors conducted an exercise to simulate the performance of CDOs and CDOs-squared. First, they took 40 hypothetical CDOs containing 100 bonds each, with a default probability (DP) of 5 percent in five years, a recovery rate of 50 percent of the face value, and a correlation coefficient (ρ) of 20 percent between the bonds of each CDO. As in the real world, each CDO had three different tranches, a junior tranche that absorbed the first losses, the mezzanine, which begins to absorb losses when the portfolio loses more than 6 percent of its original value, and the senior tranche, which is only affected when losses exceed 12 percent of the portfolio.

The results are summed up in table 1. There we see that based on the initial scenario (ρ=20% and PI=5%), a change in the parameters would bring about a downgrade in the rating of the various tranches of the instrument, according to the valuation models used by the rating agencies. In the case of CDOs squared, the downgrade was even more severe.

The recent mortgage crisis in the United States is one example of the effects of incorrect selection of parameters for a structured product. In 2006, there was a surge in the origination of low-quality loans known as subprime mortgages. In many cases, banks securitized these loans by turning them into bonds, CDOs and even CDOs-squared. These instruments received ratings of up to AAA by rating agencies because some of the parameters of the products' underlying assets were underestimated. In the case of the correlation coefficient between loans, agencies failed to take into account the fact that geographic location and mortgage vintage years[3] are closely correlated. In the case of the default probability and the recovery rate, they overlooked the fact that when housing prices fall, borrowers stop paying their debts and losses become more severe than expected.

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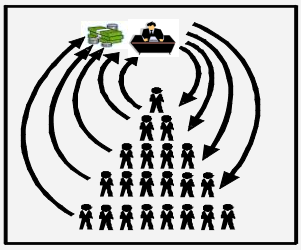
1. *"Collateralized Debt Obligation"*: Debt securities backed by various assets —bonds, loans, mortgage-backed securities, etc. See Box 1 of the Financial System Report 2007, Banco de México.
2. Coval J., Jurek J. and Stafford, E. (2008), "The Economics of Structured Finance", Harvard Business School.
3. The term "mortgage vintage" refers to a group of mortgage loans granted in a given period, normally one year (see Box 23, Financial System Report 2007).

Box 2

Ponzi Schemes and Financial Pyramids

"…Not finding sufficient recompense in their ordinary investments, savers hasten to invest in anything that promises special retributions …" W. Bagehot

Ponzi schemes and financial pyramids are frauds. They are mechanisms in which the gains paid out to the first investors come from the funds contributed by new clients. In order for this type of system to work, it needs an increasing flow of money from new investors. The business collapses when it becomes impossible to find new investors, at which point the fraudster flees with the money or the authorities step in. The early investors do often make money, when they get out on time. The last to arrive are the ones that end up losing all their savings. These fraudulent investments often offer yields that could not be obtained through traditional investment mechanisms.



In 1920, the Italian swindler Charles Ponzi managed to convince more than ten thousand Americans to invest in a business that supposedly took advantage of price spreads between postal reply coupons[1] in the United States and other countries. Although the price difference did exist, Ponzi never actually bought the coupons. Instead, he offered returns of up to 40 percent in 90 days (compared to 5 percent offered by a common savings account). It is estimated that using this formula he was able to accumulate around 14.5 million dollars.[2] His investors were ultimately able to recover only 37 cents on each dollar invested, after a trial that lasted 7 years.

Sofico, Afinsa and Forum Filatélico in Spain

In 1962, The Sofico Group, whose corporate purpose was to build, sell and lease apartments, offered a yield of 12 percent (at a time when inflation was running at 4 percent) to investors that acquired an apartment and ceded it for a number of years to this consortium to manage. The high yields offered on this scheme forced Sofico to find new clients so quickly that soon contracts began to be signed on non-existent apartments. The money from new investors was used to pay the promised yield to the earlier ones. It is estimated that 17,000 individuals were conned, losing a total of 8.2 billion pesetas.[3] In the 1980s, the companies Afinsa and Forum Filatélico accepted funds for investment in works of art, coins and stamps, as well as in pension and savings plans linked to philatelic values. Fraudsters promised returns of 6 percent, but the money they paid out came from the capital contributed by new investors. The business reached its end in 2006, by which time 400,000 small savers had been conned out of some 5 billion euros.

MMM in Russia

In the winter of 1994, a campaign of 30-second commercials managed to convince thousands of Russian citizens to buy stock in a company called MMM. The company, founded by Sergei Mavrodi, offered a return of three thousand percent a year. MMM was a simple financial pyramid, but in less than five months, the price of the stock went from one to 55 dollars. In 1994, Mavrodi was charged with tax fraud. Around 5 million investors lost their savings. [4]

Albanian Pyramids

Albania has a special place in the history of pyramid schemes, because in this country the fraud reached a level equivalent to almost half of the country's GDP and involved almost two-thirds of the population. The pyramid's collapse prompted the downfall of the government and unrest that resulted in the deaths of around 2,000 people. There were few banks in Albania at that time, and they were subject to restrictions on lending, a situation that prompted the emergence of parallel financial corporations. Between 1991 and 1992, various companies were created that accepted deposits at very high rates and used them to loan out money. Most of them were simple financial pyramids. By mid-1996, the largest pyramids were offering monthly returns of between 10 and 44 percent. By 1997, two of the largest had gone bankrupt. This triggered the collapse of many others. To keep the money from disappearing altogether, the Bank of Albania limited withdrawals from banks to 300,000 dollars and froze the accounts of suspect companies.[5]

The DMG Group in Colombia

In 2003, Grupo DMG was founded in Colombia. This consortium grouped together companies in various industries and had offices in Panama and Ecuador. Investors purchased pre-paid cards they could use to by various goods and services, while DMG promised to return the invested capital plus a return of around 50 percent in six months (five times more than the going bank deposit rate), provided the investor succeeded in adding a specific number of new clients. According to DMG, its investors assumed the role of salesmen, and the money it saved on advertising was the source that enabled it to pay guaranteed returns. The business shut down in 2008 with the arrest of its founder, David Murcia Guzmán.

The Madoff case in the United States

Bernard Madoff, an influential Wall Street businessman, former Chairman of the Board of NASDAQ and an active member of NASD, was the engineer of a massive fraud. Madoff promised his investors yields of between 8 and 12 percent for investment in funds managed by his company. Officially, he was managing equity of 17 billion dollars, but in reality he was moving amounts closer to 50 billion dollars. Only some of the money he brought in was invested; the rest was used to pay the yields that had been promised to investors. Madoff's financial prestige kept the business afloat for many years. But the international financial crisis slowed the attraction of new investors, triggering the scheme's collapse. The victims in this case were banks, major corporations, mutual funds, charity foundations and wealthy individuals. The losses were estimated at around 50 billion dollars. U.S. regulatory authorities never found anything suspicious despite numerous warnings and complaints over the years. Neither had there been any warning from the major auditing firms entrusted with supervising Madoff's funds, regarding the risks involved.[6]

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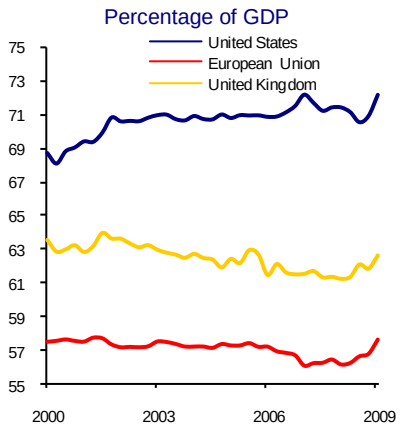
1. The postal reply coupon allows the sender to pay the recipient the value of the postage that will be used in the response letter. It is an exchangeable postal value, valid in all member countries of the Universal Postal Union. www.correosdemexico.com.mx.
2. Kitchens, T (1993), *"The cash flow analysis method: following the paper trail in Ponzi schemes". FBI Law Enforcement Bulletin*.
3. "El Supremo pone fin al 'caso Sofico', después de 17 años", El País, Madrid, May 20, 1991.
4. Kaufmann, D. (1998), "La pirámide financiera MMM", Perspectivas 127.
5. Jarvis, C. (1999), "The Rise and Fall of the Pyramid Schemes in Albania", IMF WP/99/98.
6. Mackintosh, J. (2008), "Accounting firms drawn into Madoff scandal", Financial Times.

The combination of the aforementioned factors gave rise to a period of strong credit expansion and consumption, a drop in savings, particularly in the United States (Graphs 2a and b), the emergence of a real estate market "bubble" and a growing US current account deficit. (Graph 2c).

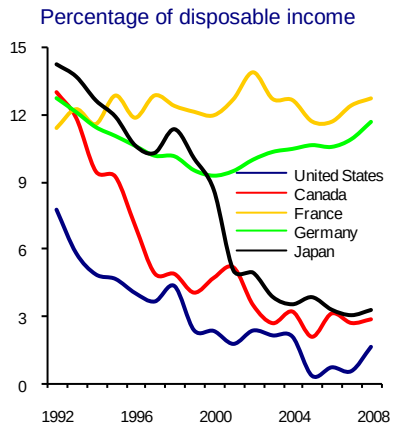
Graph 2
Consumption, Savings and US Current Account

a) Consumption in Developed Countries



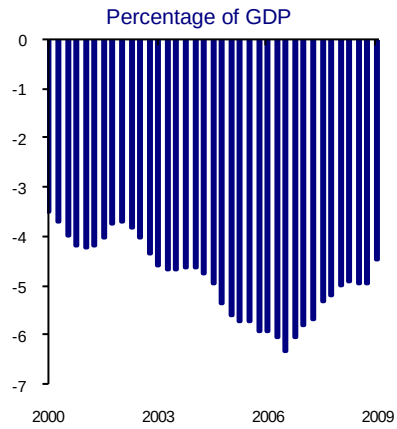
Figures as of March, 2009.
Source: Bloomberg.

b) Savings rates of developed countries



Figures as of December, 2008.
Source: OCDE.

c) United States Current Account Deficit



Figures as of March, 2009.
Source: Bloomberg.

The crisis spread throughout 2008 and for at least the first half of 2009 after deepening in September 2008. Reasons for its spread and virulence include:

I. Financial globalization and liberalization have increased cross-border investments and transactions (Box 2). At the same time, financial innovation has facilitated segmentation and the distribution of financial risks, resulting in more interconnected economies, markets and financial entities (regulated and non-regulated). This situation enabled the crisis to spread rapidly, first among developed economies and then emerging economies.

II. The widespread use of optimization models based on market prices and credit ratings has led to financial market participants acting similarly and simultaneously, resulting in illiquid markets. A necessary condition for liquidity in a market is precisely the existence of a variety of opinions about the price of the goods or assets being traded. This is how individual cautionary measures, such as selling a financial asset when the associated risk increases, can become systemic problems.

Table 2
Financial Globalization Indicators

Country	2000	2007
Assets of domestic residents abroad:	**Percentage of GDP**	
United States	63.6	127.8
European Union	85.8	154.3
Japan	68.8	118.4
Domestic assets of foreign residents[1/]:	**Percentage of GDP**	
United States	77.1	145.4
European Union	110.4	166.9
Japan	42.4	69.9
Assets of domestic banks abroad:[2/]	**Percentage of GDP**	
United States	24.3	47.0
Japan	13.1	21.4
Germany	38.9	68.9
France	38.6	76.2
United Kingdom	57.3	130.2
Switzerland	109.7	179.2
Iceland	35.4	364.3
Austria	31.3	70.8
Domestic assets of foreign banks:[3/]	**Percentage of assets**	
Central and Eastern Europe[4/]	36.2	49.3
Czech Republic	48.9	97.0
Estonia	73.1	97.0
Hungary	63.5	76.5
Poland	37.8	70.5
Russia	11.5	17.2
Eslovaquia	54.6	92.0
Asia w/o China and India[4/]	10.3	33.2
China	0.0	2.0[5/]
India	2.0	9.8
Latin America[4/]	28.4	66.9
Argentina	47.8	24.0
Brazil	26.4	23.0
Chile	38.4	59.6
Mexico	28.5	82.0
Peru	66.1	48.5
Venezuela	20.7	26.0

1/ Source: Bureau of Economic Analysis, Eurostat, Central Bank of Japan and IMF.
2/ Source: Bank for International Settlements (BIS), IMF and the Central Bank of Japan. Information related to banks which report to the BIS.
3/ Source: CGFS March 2004, BIS; "Foreign Bank participation and Crisis in Developing Countries", World Bank, Cull R. and Peria M., 2007 and Fitch Ratings country reports.
4/ Foreign participation by region based on the weight of each country's bank assets in the total.
5/ Using 2004 data.

Collective or "en masse" behavior in response to adverse news also can bring about a sudden drop in the price of an asset, forcing all participants to settle additional positions. Such behavior exacerbates the price movements of financial assets increasing correlations and volatility levels in turn. In other words, the risk becomes endogenous (Box 3). The result is that the occurrence of so-called "black swans"[3] becomes more likely. Financial regulations have paradoxically contributed to reducing diverse behavior among market participants by increasing their sensitivity to market price behavior.

III. Authorities in the most developed countries failed to identify the origin and anticipate the spread of the crisis quickly enough. Responses were generally tardy and insufficient. There was no clarity with respect to the strategies which needed to be followed[4] or enough coordination between the financial authorities involved.

IV. Serious liquidity problems and the collapse of credit in the financial markets of developed economies rapidly undermined growth prospects, bringing economic activity to a near standstill. The erosion of household wealth stifled consumption along with the production of goods and services with a contagion effect on the real economy and international trade. The upshot was a severe slowdown in the economic activity of both developed and emerging markets irrespective of the conditions individual financial systems were in.

[3] See Box 26 in the 2007 Financial System Report.

[4] Geithner, Timothy, "Remarks by Treasury Secretary Timothy Geithner introducing the Financial Stability Plan", US Department of the Treasury, February 10th, 2009.

Box 3

Persaud's Paradox and Endogenous Risk

Over the past few decades, a concerted effort has been made to understand and better manage the risks involved in the financial markets. Much research has been done into the field which has helped develop models that can be used to manage and quantify financial risks. During the same period, the number of financial crises and failures of large financial institutions has also dramatically grown. The close relationship between the occurrence of financial catastrophes and the growing interest of market regulators and participants in using risk models has led some researchers to ask whether or not the models themselves have contributed to the rise in risk.

For Avinash D. Persaud,[1] the paradox is obvious. The widespread adoption of strategies considered to be low risk turns what are thought to be low-risk assets into risky assets. Most fund managers, explains Persaud, make their decisions based on modern financial theory, in three phases: i) they select the financial instruments that should be included in the investment portfolio (stocks, bonds, currencies, etc.) based on expected yields, volatilities and co-variances. Covariance is the degree of similarity between the yield on two instruments when they move away from their average yield. A high covariance means the two instruments draw away from their average in the same direction and at the same time. The larger the covariance, the greater the risk that two or more assets will undergo simultaneous losses, so a low covariance is considered a risk diversification strategy. ii) Fund managers create an optimum portfolio of financial assets. To optimize a portfolio, managers select instruments that not only offer high expected yields but have low volatility and little covariance among them. iii) The selected portfolio is managed within a specific risk profile. When volatility and the covariance of the portfolios rise, the risk increases. If the expected loss on a portfolio in a given time period reaches the threshold established in the risk profile, managers must reduce the risk by selling off some of the more volatile assets or those with a higher degree of correlation.

When the "optimum portfolios" selected by various market participants are substantially similar to each other, problems arise. Financial information has become practically public domain, and managers often use similar criteria in their investment strategies. So it is no coincidence that more than one portfolio may include the same financial assets, and decisions are guided by similar risk models. This situation creates excess demand for certain financial assets. But finances are not like classical physics, where measurable phenomena do not change their behavior or state as a result of observation. In the financial world, the nature of investment instruments and their correlations change in real time as a result of the decisions that are made based on the conclusions gleaned from financial models. So for instruments known for being high-yield, low-risk assets, similarities between portfolios increases the risk, turning them into overvalued assets unable to provide a yield superior to others. As a result, investors try to unload these instruments in order to conform to their risk profile. Then the sale of less correlated instruments creates an increase in their correlation, and thus their risk. The combined decline in the prices of those instruments in turn produces larger and larger sell orders, affecting their price and correlation. This process turns portfolios that historically offer high yields, low volatility and reduced correlation into portfolios with negative yields, high volatility and high correlation.

This situation is similar to what happens when we go from the world of classical physics (where measurement does not alter the phenomena it observes) to that of quantum mechanics and the principle of uncertainty: phenomena change unpredictably upon being observed. Persaud asserts that this paradox can be proven empirically, and it is the main reason for various phenomena that have occurred in recent years, like the breakup of Long Term Capital Management in 1998.

Jon Danielsson proposes a similar paradox, but with a slightly different focus. For Persaud, risk models are partly to blame for financial crises. Danielsson, on the other hand, believes that economic cycles and the types of events subject to measurement are what influence the reliability of the models.[2] Danielsson calls this phenomenon *endogenous risk*. For this author, endogenous risk can be ignored on a day-to-day basis when we are at the peak of an economic cycle. But in crisis situations, risk appears and the models fail. Rating agencies base their credit ratings on sophisticated statistical models. One of the main problems that was revealed by the subprime crisis was rating agencies' incorrect valuation of investment vehicles. Rating agencies under-estimated the correlation between borrowers' defaults, because they assumed that mortgage defaults were independent events. This assumption may be valid at the high end of an economic cycle, but history has shown that in hard times, the behavior of mortgage debtors becomes highly correlated. Unfortunately, the data bases used by agencies to rate investment vehicles backed by mortgage portfolios did not cover a long enough period of time.

Danielsson and Persaud have proposed various measures to offset endogenous risk. For Danielsson, the usefulness of financial models is limited to small and frequent events. Models can be confusing when they are used to measure longer-term, extensive, and infrequent events —so called "black swans." Alternative solutions include the use of appropriate standards of management and better regulation. Persaud proposes a different approach to analyzing and creating "optimum portfolios." To analyze a financial instrument, portfolio managers must take two components into account, one structural and one cyclical. The first analysis must contain the yield and volatility of the instrument as described. The second should capture the impact of strategic behavior and market positions. For example, the cyclical component should supply information on market concentrations in given instruments. It is not easy to obtain good market concentration measures. Persaud therefore proposes using the covariances of the instruments themselves as an approximation, but interpreting the information obtained in the opposite direction of how it is interpreted now. In other words, instead of assuming that the future is a positive function of the past, we must assume that it will be an inverse reaction to it. So low covariances in the past necessarily mean high covariances in the present, and vice versa. The main weakness of this proposal is that its success would diminish to the extent that it was adopted on a widespread basis, as currently occurs with risk models. Another of Persaud's proposals is to attenuate market cycles through the application of counter-cyclical regulations. This would mean regulatory and fiscal mechanisms designed to work against the direction of the usual incentives investors face. For example, requiring additional reserves above the regulatory minimum, which increase as institutions' leverage rises.[3]

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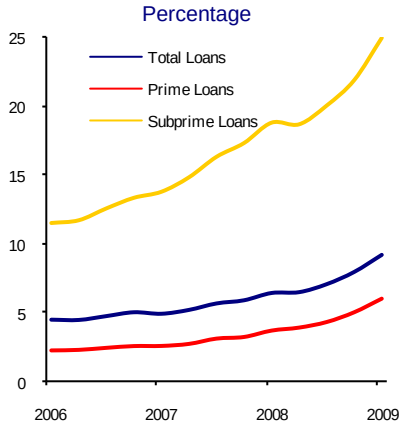
1. Persaud, A. D. (2002), "The folly of Value at Risk".
2. Danielsson, J. (2008), "The paradox of models".
3. Persaud, A. D. (2008), "The light that failed".

2.2. Evolution

The first symptoms of the crisis came to light in 2006 with an increase in subprime mortgage loan defaults (Graph 3a). Factors which contributed to a rise in defaults include the drop, as of 2005, in US house prices (Graph 3b). However, the crisis did not officially break out until August 2007 with the announcement that the French bank, BNP Paribas, had frozen three of its investment funds because it was unable to price their assets.

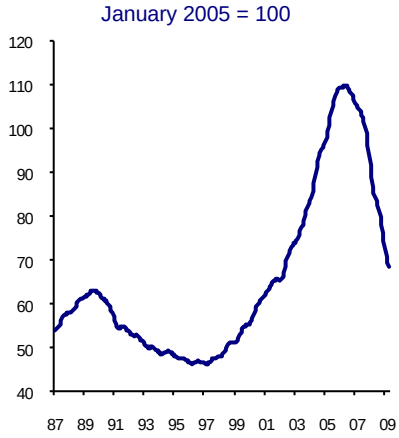
Graph 3
US Mortgage Crisis Indicators

a) US Mortgage Portfolio Delinquency Rate



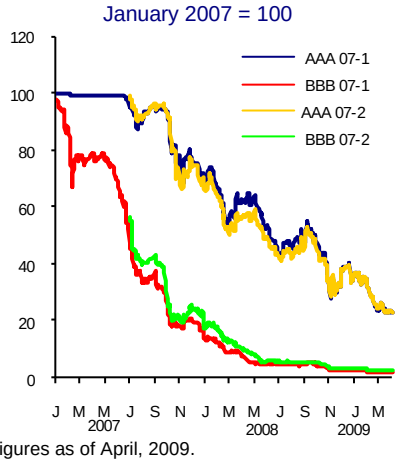
Figures as of March, 2009.
Source: Bloomberg.

b) Case-Shiller US Home Price Index (CSXR)[1/]



Figures as of April, 2009.
Source: Standard & Poors.
1/ CSXR compound index deflated using the consumer price index.

c) Price Indices of Mortgage-Backed Securities Obtained From Credit Default Derivative Indices (ABX)



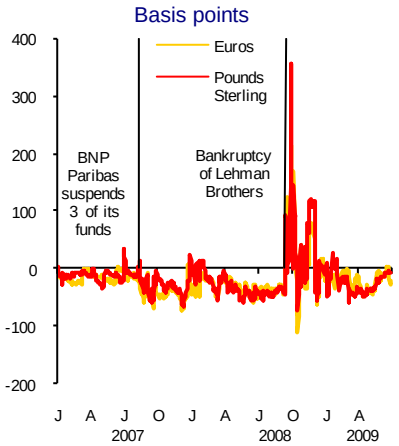
Figures as of April, 2009.
Source: Credit Suisse.

Growing mortgage defaults began to generate heavy losses for many US and European financial entities. Meanwhile mortgage-backed loan credit rating downgrades and doubts about the valuations of structured securities, and the performance of rating agencies in general, triggered sharp decreases in the prices of mortgage-backed securities (Graph 3c). As a result, the asset-backed securities market all but disappeared. At the same time the collapse of the commercial paper market prevented the refinancing of short-term debt using investment vehicles, thus forcing a large number of banks to either provide the required liquidity or consolidate the debt on their balance sheets. The recognition of these losses and undesired increase in balance sheet debt, gave rise to growing liquidity needs, and more particularly capital, among several banks.

Thus, counterparty risk[5] began to dominate the scene at many financial entities causing interruptions in the workings of many markets, especially the interbank one. This was reflected in considerable increases in interbank interest rates and government debt spreads (Graph 4). September 2008 saw a repeat of this situation following the bankruptcy of Lehman Brothers.

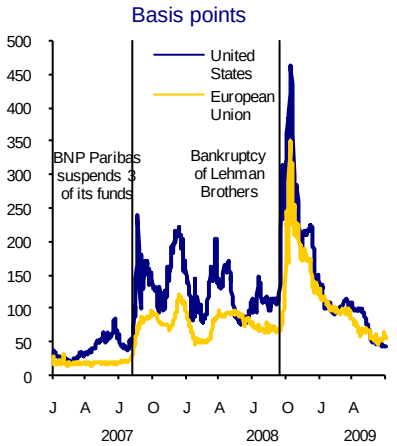
Graph 4
Liquidity Indicators

a) Spread between the implied rate in Dollars of a Foreign Exchange Contract and Three- Month Libor



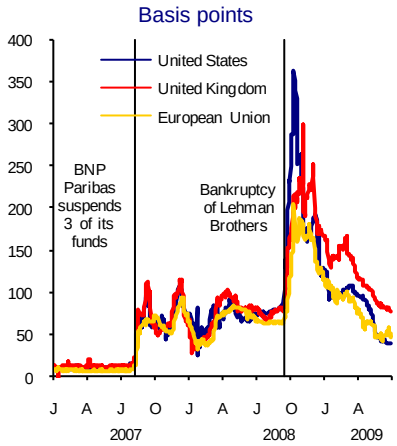
Figures as of June, 2009.
Source: Bloomberg.

b) Spread between LIBOR and the Yield on Three-Month Treasury Notes



Figures as of June, 2009.
Source: Bloomberg.

c) Spread between Three-Month LIBOR and the Three-Month Overnight Indexed Swap (OIS)



Figures as of June, 2009.
Source: Bloomberg.

Movements in the Libor rate usually have a big impact on economic activity due to the large number of loans and debt securities with interest rates that are indexed to it. Its behavior also affects entities which finance a large portion of their assets in the interbank market. It was for this reason that the central banks of the world's main economies decided to inject liquidity into interbank markets because they attributed the increase in the Libor rate to a lack of liquidity rather than deterioration in counterparty risk. However, massive injections of liquidity into the interbank market and other similar measures failed to ease the crisis.

In March 2008, the acquisition of the US investment bank, Bear Stearns, by JPMorgan with the support of the US Treasury was announced.[6] This was followed in September that year by the US government's intervention in mortgage agencies Fannie Mae and Freddie Mac, the bankruptcy of Lehman Brothers and intervention in the insurance AIG. A few days later, the US government announced several guaranty programs for certain types of debt issues, increases in deposit insurance and funds for the acquisition of toxic assets. Lehman Brothers' bankruptcy and uncertainty generated by a lack of clarity with respect to the precise use of government-approved emergency resources to support the US financial system undoubtedly represented an inflection point in the financial crisis. In mid September 2008, these events triggered an overall loss of confidence resulting in a massive flight to safety. The share prices of the main US banks

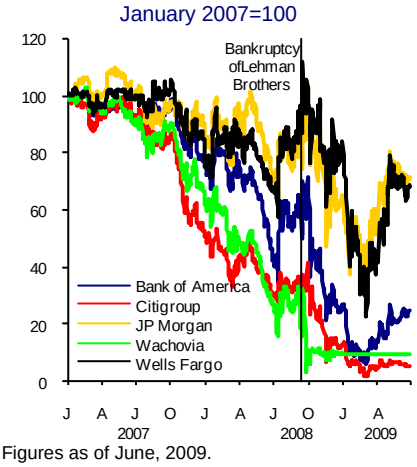
[5] The counterpart risk is the possibility of one of the parties involved in a transaction failing to meet their obligation thus causing the other party to incur a loss.

[6] See Box 7 in the 2007 Financial System Report.

plunged and credit default indices rose (Graph 5). In less than three days, several European financial institutions had to be bailed out. Because of their size and because their operations spanned several countries, some of these bailouts required the involvement of several governments. Thus the speed and size of the crisis continued to catch financial markets off guard. And when a crisis is systemic, it is not easy to stem and reverse an overall loss of confidence (Box 4).

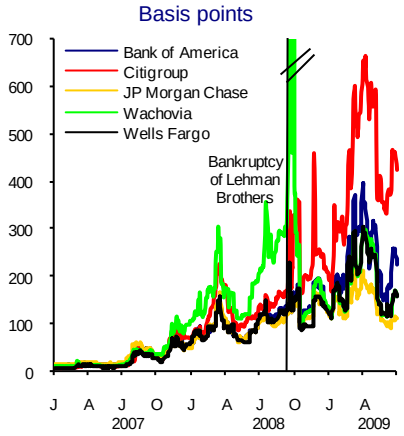
Graph 5
Increase in Risk Aversion

a) US Bank Share Prices



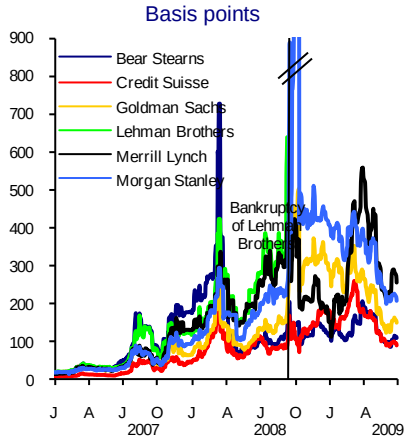
Figures as of June, 2009.
Source: Bloomberg.

b) Commercial Bank Credit Default Derivative Indices



Figures as of June, 2009.
Source Bloomberg.

c) Investment Bank Credit Default Derivative Indices



Figures as of June, 2009.
Source Bloomberg

Box 4
Trust

The current global financial crisis has resulted in what some scholars are calling a "trust crisis"[1]. The following are some definitions of trust or confidence and how it relates to economic growth and the financial system.

Definition

When a person says he or she can trust another, it means that the person expects that the other will perform a beneficial action —or at least not detrimental to them— in the future, and that action has a high probability of occurring. Therefore, the person is willing to cooperate with another. This is how Gambetta (1988) [2] defines trust. Trust is the subjective probability based on which an individual believes that another (agent or group of people) will perform a certain action, assuming that the individual will make his or her decision before being able to monitor that action. Thus, trust is affected by uncertainty about the behavior of the other person and the degree of freedom that other agents have to disappoint us. Trust can therefore be understood as a threshold in the distribution of probabilities of expectations regarding the future behavior of others, on which our present decisions depend.

La Porta *et al*. (1997)[3] say that trust is the propensity of people in society to cooperate and seek out a more efficient result, avoiding non-cooperative traps. Putnam (1993)[4] establishes that confidence is composed of moral resources, which grow with use and diminish if not used. Trust depends on various factors that determine when an agent will trust another. Alesina and La Ferrara (2002)[5] identify, among other factors, the individuals' culture, traditions and religion; the time a person has lived in a community with similar backgrounds, like families or members of the same social, racial or ethnic group; the duration of the interaction with the other agent, since confidence can increase with the expectation of a repeated interaction in the future; belonging to a group that is the object of discrimination; and legal institutions, because agents trust more in societies where wrongdoers are pursued and punished effectively.

Confidence and growth

The economic life of a nation, its level of well-being, and its capacity to compete, all depend on the level of trust inherent to its society, as Fukuyama establishes (1995)[6]. But in a society in which inhabitants express a lack of confidence, a system of legal standards and rules can be created to substitute for it. This generates certain transaction costs in the economy that might have been avoided if such confidence existed. Knack and Keefer (1997)[7] say that economic activities, which require that individuals trust in the future actions of other agents, are carried out at less of a cost in societies where trust is greater. So in societies of higher trust, there is more investment and economic activity, which in turn bring about higher returns on the accumulation of social capital. Finally, Knack and Zak (1998)[8] posit that a sufficient amount of trust is fundamental for economic development; otherwise the rate of investment declines and economic growth slows, generating possible poverty traps.

Trust and the financial system

"While trust is fundamental to all trade and investment, it is particularly important in financial markets, where people part with their money in exchange for promises"[1]. Guiso *et al*. (2004)[9] point out that financial contracts are trust-intensive, because in them money flows are traded for the promise of receiving the principal plus an additional yield in the future. This depends on the legal framework and its observance, as well as the degree of trust between the investor and the institution that receives the funds. Alesina and La Ferrera maintain that trust and social capital can smooth out market imperfections and facilitate transactions in the economy, especially in the financial markets.

On this point, Guiso (2008)[10] says that the decision to invest in the stock market not only implies an evaluation of the inverse relationship between the risk and the yield on an instrument, given the information available to the investor, but it also implies a level of confidence that the data is accurate and the system fair. Thus, trust is based on both the objective features of the financial system (quality of investor protection and adherence to the rules) and on the subjective qualities of the person who bestows that trust (education and religion). These authors present empirical evidence that trust is the most important factor for an investor when deciding whether or not to participate in the stock market.

In its December 2008 survey, the Financial Trust Index found that American households trust more in other people than in banks, bankers, the government, major corporations, stockbrokers and finally, the stock market. From that index, we find that in the last quarter of 2008, household confidence in the financial markets and institutions dropped significantly. This situation explains why many investors chose to sell their shares or withdraw deposits from some banks. The families that reported the lowest levels of trust were those that attributed the current crisis to a lack of adequate supervision and regulation, as well as those who believed it was caused by poor corporate governance and the greed of financial institutions' directors. The results of the second survey, in March 2009, show that the financial trust index declined slightly, while confidence in the stock market increased slightly. But trust in banks and major corporations continued to weaken significantly.

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1. Chicago Booth, Kellogg School Financial Trust Index. [online] URL address: http://www.financialtrustindex.org/resultswave1.htm, http://www.financialtrustindex.org/faq.htm
2. Gambetta, D. (ed), (1988), "*Trust. Making and Breaking Cooperative Relations".*1st. ed., United States, pp. 213 – 237.
3. La Porta, R., *et al*. (1997), "*Trust in large organizations",* The American Economic Review, Vol. 87, No. 2, pp. 333-338.
4. Putnam, R., 1993, "*Making Democracy Work. Civic Traditions in Modern Italy,"* 1st. ed., United States.
5. Alesina, A., *et al*. (2002), "*Who trusts others?*" Journal of Public Economics, Vol. 85, No. 2, pp. 207 – 234.
6. Fukuyama, F. (1995), *Trust. The Social Virtues and the Creation of Prosperity,* 1st. ed., United States
7. Knack, S., *et al*. (1997), "*Does Social Capital Have an Economic Payoff? A Cross-Country Investigation*", The Quarterly Journal of Economics, Vol. 112, No. 4, pp. 1251 – 1288.
8. Knack, S., *et al* (1998), "*Trust and Growth*", IRIS, pp. 1 – 38.
9. Guiso, L., *et al*. (2004), *"The Role of Social Capital in Financial Development*", The American Economic Review, Vol. 94, No. 3.
10. Guiso, *et al.* (2008), "*Trusting the Stock Market*", The Journal of Finance, Vol. 63, No. 6, pp. 2557 – 2600.

Measures adopted by the world's main economies

The financial authorities of the world's main industrialized countries failed to identify the origin and spread of the crisis in time. Likewise, the responses were generally lacking and the measures not always appropriate. Furthermore, a lack of clarity with regard to the strategies to follow and weak initial coordination among the financial authorities of the countries involved, contributed to worsening the crisis.[7] Nevertheless, it should be pointed out that the experience of the 1929 Great Depression resulted in financial authorities taking a very different approach to the current crisis. During the Great Depression, due to the gold standard system which prevailed at the time, the Federal Reserve wound up tightening monetary policy too much in an attempt to defend the dollar. This forced other countries to tighten their monetary conditions as well in order to support their individual exchange rate regimes. Monetary policy tightening within a context of fixed exchange rates helped export the crisis, exacerbating the international economic depression.

Another big difference between the current crisis and the Great Depression is related to contagion channels. At the beginning of the 1930s, one of the main propagation channels was the erection of protectionist barriers which contributed to worsening the slowdown in economic growth.[8] Today on the other hand, it is the high degree of interconnection between economies and financial markets that has contributed to the crisis spreading rapidly.

The lessons of the Great Depression led US authorities to try to reestablish normality in financial markets through massive liquidity injections. However, it soon became evident that the crisis was not limited to the mortgage market and that neither could it be resolved by injecting liquidity alone. Initial manifestations of illiquidity were quickly followed by solvency problems. The speed with which the crisis spread did not permit a satisfactory diagnosis and the situation soon overwhelmed authorities in developed countries.

The responses of developed country authorities to the crisis evolved as events took place. Initially it was assumed that liquidity injections along with an illiquid asset acquisition policy could reestablish normal market workings. However, difficulties setting the prices of these assets as well as controversy surrounding the initial version of the Troubled Asset Relief Program (TARP) forced authorities to use most of the funds to capitalize several banks. The lack of clarity surrounding the use of TARP funds and the bankruptcy of Lehman Brothers evidenced in turn the lack of a coherent strategy. As of that point the crisis became one of unprecedented force and size. Since then different policies aimed at containing its most serious fall-out have been strengthened (Boxes 5 and 6). The origin of the crisis in developed countries and its global spread called for a global response, which resulted in the G-20 assuming a major role in creating an agenda aimed at shoring up the international financial system (Boxes 7 and 8).[9]

[7] One example of this are the criticisms by some governments of the actions of others and policy changes in relation to deposit insurance coverage.

[8] In 1930, the US Congress approved the Smoot-Hawley tariff, which raised import duties to 60%. Several European countries including Italy, France and Germany placed counter tariffs on US imports. As a result, during the period 1930 to 1933 international trade decreased by between 30 and 50%.

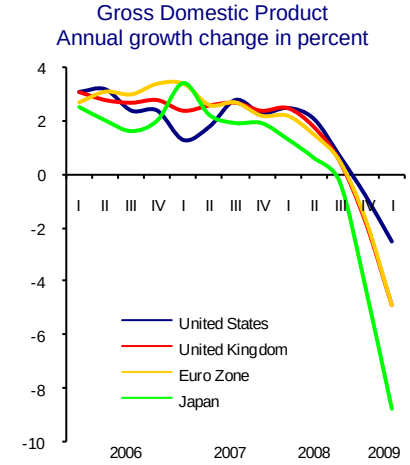
[9] The G-20 is comprised of Germany, Saudi Arabia, Argentina, Australia, Brazil, Canada, China, South Korea, the United States, France, India, Indonesia, Italy, Japan, Mexico, the United Kingdom, Russia, South Africa, Turkey and the European Union.

Impact on economic activity

The outlook for the global economy has rapidly deteriorated as a result of the international crisis. Its recessive effects have been reflected in economic indicators and growth projections for both industrialized and emerging economies. Although the slowdown in the world's most developed economies began at the end of 2007, economic activity did not begin to weaken until 2008, such that in the fourth quarter of that year real GDP for the United States, the Euro Zone, the United Kingdom and Japan registered year-on-year contractions, which worsened in the first quarter of 2009 (Graph 6a). The reduction in the amount of financial intermediation outside of traditional channels, increases in counterparty risk and losses on banks' balance sheets, have encouraged a process of widespread de-leveraging in most developed countries. This will be particularly aggressive in the case of several banks with high asset to equity ratios (Graph 6b). Interbank credit has become notably expensive and long-term financing has decreased, all of which has been reflected in a credit crunch (Graph 6c).

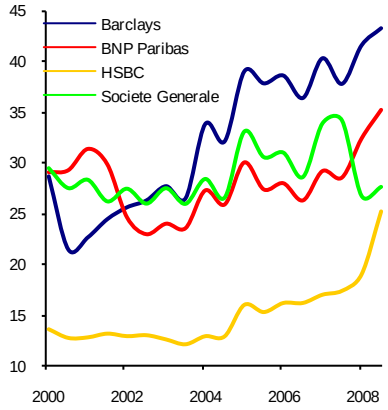
Graph 6
Economic Growth and Credit Restrictions

a) Gross Domestic Product of Developed Countries



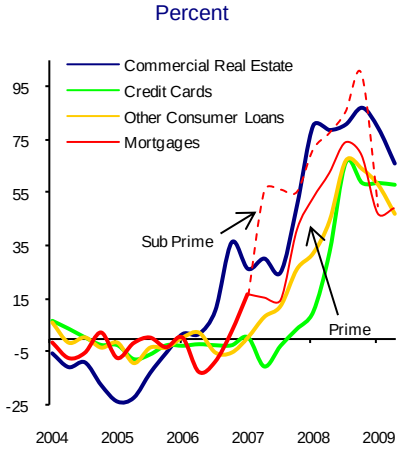
Figures as of March, 2009.
Source: Bloomberg.

b) Asset to Equity Ratio of European Banks



Figures as of December, 2008.
Source: Bloomberg.

c) Percentage of US Banks Which Reportedly Restricted Lending



Figures as of June, 2009.
Source: Federal Reserve "*Senior Loan Officer Opinion Survey on Bank Lending Practices*".

Box 5

Measures Adopted in the World's Largest Economies

The measures taken by authorities in the world's largest economies can be classified into groups according to their objective, as follows:

1. Restoring the Functioning of Interbank Markets
To reverse the rise in interest rates in interbank markets, the following measures have been adopted:

Open Market Operations
The Federal Reserve, the European Central Bank, the Bank of England, Bank of Japan and other central banks have all injected substantial amounts of money through traditional open market operations (OMO) and term auction facilities (TAF). Central banks increased the amounts and frequency of the auctions, and the terms and range of eligible collateral. The Federal Reserve created and later modified its mechanisms in order that institutions could borrow U.S. Treasury Bonds in exchange for high-quality collateral, if their liquidity was affected by increased risk aversion. The purpose of the Term Security Loan Facility (TLSF) is to facilitate intermediaries' the access to market liquidity. [1]

Standing Liquidity Facilities
Several central banks, like England's, Australia's and Mexico's, have extended the terms of their loans and the range of assets that are eligible as collateral for the Discount Window Facility (known as Standing Liquidity Facilities)[2] For example, the Bank of Canada included in its list of acceptable guarantees the asset-backed commercial paper (ABCP). In order to better distribute liquidity among market participants, the Federal Reserve expanded the universe of institutions with access to primary credit, this includes the market makers. The last action was done through the creation of a facility known as the Primary Dealer Credit Facility (PDCF).[1]

Provision of Guarantees for Interbank Loans and Debt Securities from Credit Institutions
Some deposit insurance agencies extended some temporary guarantees on new bank debt. In the United States, for example, the Temporary Liquidity Guarantee Program (TLGP) extended the guarantees on securities debt from those FDIC-insured institutions, certain bank holding companies and thrift institutions. In Germany, Hypo Real Estate, which main function is to finance mortgage companies, developers and real-estate funds, received guarantees among others, from the German Financial Market Stabilization Fund (SoFFin) and the Central Bank of Germany. In addition, guarantee schemes with different characteristics have also been created in Denmark, the United Kingdom, Spain, Australia, New Zealand, Germany, Ireland, Switzerland, Denmark, Korea, Holland, Austria and Italy, among others.

2. Facilitate Commercial Banks' Access to the Foreign Currency
In order that central banks be able to meet its foreign currency liquidity needs, in their local markets and without having to use international reserves or put pressure to the foreign-exchange market, the following mechanism was used:

Foreign Currency Swaps
The Federal Reserve have signed currency swap agreements (exchanging dollars for local currency) with the central banks of Japan, England, Canada, Switzerland and the European Central Bank, as well as the central banks of Brazil, Korea, Mexico (30 billion dollars) and the monetary authority of Singapore, among others. It also agreed to accept pounds, Swiss francs, yens and euros in exchange for dollars, to meet the liquidity needs of U.S. banks in these currencies.

3. Avoidance of Banking Runs
In some countries, in order to reduce the risk of mass deposits withdrawals of those troubled banks (bank run), deposit insurance was increased, meanwhile others decided to create this deposit insurance mechanism by first time.

Extension of the Deposit Insurance Coverage
Among the countries that extended the coverage of their deposit insurance schemes were: Ireland (from 20 to 100,000 euros), Germany (100 percent of deposits), the United States (from 100 to 250 million dollars), the United Kingdom (from 35 to 50 million pounds), France (to 70 million euros), Denmark (100 percent for two years) and Austria (100 percent).

Development of a Deposit Insurance Scheme
Recently, some countries that lack an explicit deposit insurance system have decided to introduce it. This is the case for Australia (100 percent for 3 years) and New Zealand (at the beginning stated at 100 percent and is going to be modified to one million New Zealand dollars).

4. Restoring Financial Institutions Solvency
As banks were unable to meet their capital requirements from private investors and the cost of capital on international markets became increasingly expensive, many governments have been in the necessity to intervene directly in the banks. They did so in a variety of ways, including stock purchases (ordinary and preferred), the issuing of subordinated and convertible notes, or some other type of participation, frequently with limited corporate rights.

Nationalization
The United Kingdom was the first to appeal to a nationalization mechanism when it took over Northern Rock Bank and then Bradford & Bingley. In the Benelux countries, the authorities stepped in to bail out Fortis, which involved the partial nationalization of its conglomerate's operations in Holland, Belgium and Luxembourg.

Stock Acquisitions
Some governments have preferred to intervene in banks by acquiring share participations. In certain cases, these measures have involved the acquisition of more than 50 percent of the institutions' total equity. For example, the government of the United Kingdom acquired a majority stake in the ordinary shares of the Royal Bank of Scotland and it also has a substantial, though minority, position in HBOS and Lloyds.

Issues of Preferred Stock (Unconvertible Subordinated Debentures)
In some countries like the United States, the authorities initially tried to avoid drastic interventions like nationalizing or acquiring common shares. So, authorities decided to re-capitalize institutions by acquiring preferred shares that did not entail any corporate rights through capital purchase program (CPP). At first, restrictions were set on the repurchase of the shares, but they were later relaxed, under certain conditions, so institutions can repay them. Ten of the institutions that have already repaid the funds, which were received through the CPP, are among the twenty largest banks which have used such funding. In Italy, Spain and the United Kingdom this type of acquisition with limited rights has also been used to recapitalize institutions. Preferred shares are similar to unconvertible subordinated debentures.

Issues of Convertible Subordinated Debentures
Another option is to acquire convertible subordinated notes. In the United States, the original capitalization scheme, which was characterized by the acquisition of preferred shares, was modified by the possibility to acquire subordinated debentures convertible into common shares. Thus, through the Supervisory Capital Assessment Program (SCAP), the 19 largest deposit institutions of that country were submitted to stress testing to determine the amount of capital they would require under various scenarios of economic deterioration.[3] The institutions would have a period of six months to raise the necessary capital.

Switzerland, for its part, took measures to strengthen UBS bank's capital by subscribing mandatory convertible notes. Through this scheme, the government did not acquire an immediate stake in the bank's ownership, and it also may withdraw from its commitment during the term of the loan. France used a scheme of "highly subordinated notes" to increase the level of capital of six banks whose capitalization indices were already good before applying the measure.

Purchase of Illiquid Assets
These programs are intended to relieve banks' balance sheet from troubled loan portfolios and illiquid assets. For example, Switzerland, introduced a mechanism to strengthen UBS's balance sheet. The bank created a trust by contributing a certain amount of initial capital. The trust will receive a loan from the central bank, which must be settled fully by UBS bank in a period of up to 12 years. With these funds, the trust will buy the illiquid assets of UBS bank and these ones will remain as collateral on the loan itself. Some other countries that have introduced portfolio purchase programs are Spain, Australia and Italy.

There are other extraordinary cases of portfolio purchases; one case is the one of the United States, which consists of the development of two programs. The first one is the Federal Reserve's acquisition of residential mortgage-backed securities, which were guaranteed by Fannie Mae, Freddie Mac and Ginnie Mae, as well as debt securities that were directly issued by these institutions. The second involves the creation of a public/private fund to acquire banks' loan portfolios and investors' illiquid assets backed securities[4]. Those interested in acquiring these assets will participate in an auction, so the winner will have to create a fund which will consist of its own capital, the financing from the U.S. Treasury or Federal Reserve, and with the guarantee from the FDIC. The authorities hope that the private sector participation in these auctions will help determine a fair price for the assets.

Guarantees for the Portfolio Value
The authorities from the United States decided to guarantee the value of some portfolios of assets from banks in order to cap the maximum losses. Through an asset guarantee program (AGP) the Treasury and FDIC offered protection against possible losses on asset portfolios from Citi and Bank of America. The latter case was the result from the acquisition of Merrill Lynch. The two institutions receive the protection in exchange for the payment of a commission in the form of preferred share issued to the Treasury and the FDIC. Through these schemes the capital burden for these institutions was reduced.

4. Improving Conditions in Debt Markets
In order to improve conditions in these markets, particularly over the longer-term horizon, the following program was introduced:

Purchase of Government Debt Securities
The Federal Reserve began a program of purchasing U.S. Treasury Bonds for up to 300 billion dollars. The acquisitions focused on the long end of the yield curve and will be made over a 6-month period. The Bank of England created an asset purchase facility (APF) to buy up the British government debt of maturities of more than 5 years. The Bank of Japan increased its acquisition of government securities program across all terms.

5. Restoring Lending
Authorities have been taken some measures to reduce the scarcity of financing affecting companies and consumer alike.

Schemes to Reactivate the Market for Credit Asset-Backed Securities
In the United States, a number of schemes were introduced, such as the term asset loan facility (TALF), which consists of giving a loan from the Federal Reserve to finance the purchase of securities backed by consumer loans and small business asset portfolios. The program includes a contribution of Treasury's capital to absorb losses and is intended to reduce the credit contraction that depends largely on portfolio securitization.[5]

To avoid the collapse of the short-term commercial paper market due to scant liquidity and continue risk rising aversion, the authorities have developed a number of programs. In one of them, the Treasury Department temporarily guarantees the stock prices of money market mutual funds (MMMF). In a complementary program, the Federal Reserve crated three facilities to support short-term liquidity funds, which are the Commercial Paper Financing Facility (CPFF), the Asset Backed Commercial Paper (Money Market Mutual Fund Liquidity Facility (AMLF), and the Money Market Investors Financing Facility (MMIFF).

Meanwhile, to increase liquidity and flows of credit in its own corporate markets, the Bank of England began purchasing high-quality private sector assets[6] through an APF (described in the previous section). The government covers the losses associated with this facility.

Clauses that Forced those Banks which Were Recapitalized With Public Funding to Maintain Lending Flows

In the United Kingdom, for example, banks that received public funding support must keep credit available to companies and households for the next three years at levels similar to those of 2007, and at competitive prices. A "lending panel" was created to monitor the compliance with this condition, and supervise the banks' credit flow to individuals and companies, and promote better industry practices in the treatment for borrowers that run into financial difficulties.

Similarly, in Germany legislators are considering a measure to force publicly supported banks to continue extending loans to small and medium-sized businesses.

6. Support for Troubled Borrowers
In order to stem the depletion of mortgage portfolios and assets associated with this type of credit, the following measure was introduced:

Debtor Relief Programs
Some countries like the United States, the United Kingdom and Spain have introduced programs to support borrowers who are having trouble in maintaining current with their payments. The U.S. government has launched a plan that will offer support to 7 and 9 million mortgage borrowers. Part of this program may consist of restructuring mortgages, even when they have already been securitized, and in general it involves an improvement in credit terms, such as lower monthly payments, as a result of longer terms and/or lower rates, even the forgiveness of the principal in certain circumstances.

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1. Box 5 of the Banco de México 2007 Financial System Report provides more details on this facility.
2. Box 30 of the Banco de México 2007 Financial System Report contains an explanation of Standing Liquidity Facilities.
3. A summary of SCAP results is presented in Box 6.
4. Public-private investment program (PPIP), described in Box 6.
5. To support small businesses, another program was introduced whereby the Treasury Department directly acquires assets backed by loans guaranteed by the Small Business Association (SBA) and often sold by banks on the secondary market.
6. Some of these assets are: paper issued with credit collateral, corporate bonds, commercial paper as well as a limited range of asset-backed securities.

Box 6

Supervisory Capital Assessment Program and Public-Private Investment Program for Legacy Assets

Upon taking office, the new U.S. federal government administration announced a set of measures to strengthen banks' balance sheets. The core program elements include: i) the evaluation of the capital needs of the major U.S. banking institutions through stress testing and offering the option of government capitalization; and ii) the introduction of a program to clean bank balance sheets of illiquid assets.

Capital Assessment Program

In February 2009, the Federal Reserve, along with other banking supervision institutions, introduced a Supervisory Capital Assessment Program (SCAP). The purpose was to measure the amount and composition of the additional capital, which any of the 19 largest banks of that country would need in order to exceed the minimum regulatory capital of the year-end 2010, even in an adverse economic environment. Through the "stress test" exercise the level of Tier 1 was evaluated with respect to the amount of risk weighted assets, as well as the proportion of Tier 1 that was constituted by common shares. This indicator is defined by the SCAP as "Tier 1 common capital."

In this exercise, the authorities asked to those participating institutions estimate the potential losses on their loan portfolios, trading operations and investment on securities as well as their off-balance sheet liabilities, under two different macroeconomic scenarios. The institutions also estimated their expected revenues and provisions for the remainder of this year and the next. These estimates were reviewed and compared by the corresponding supervisors in order to obtain an official and unique estimate of potential losses. For this exercise, it was agreed that under the worst-case scenario, institutions must be able to maintain a basic level of risk-adjusted capital of six percent (the regulatory minimum is four percent) and a Tier 1 common capital of four percent (this measure is not among the typical measures of the current regulatory capital indicators).

The stress tests' results reflect that should the worst-case scenario materialize, during 2009 and 2010, the losses of the institutions analyzed could reach up to 600 billion dollars. Seventy-five percent of these losses would come from mortgage and consumer loan portfolios. The authorities found that with this level of potential losses, expected revenues, reserves contributions and those actions taken by various institutions during 2009 to strengthen their capital structure,[2] only 10 of the 19 institutions that were evaluated would require additional resources for an aggregate amount of 74.6 billion dollars (see table below).

Capital Assessment Program Results
Billion dollars

Bank of America	33.9
Wells Fargo	13.7
GMAC	11.5
Citigroup	5.5
Regions; Sun Trust; Key Corp; Morgan Stanley; Fifth Third; PNC.	10
American Express; NYMellon; BB&T; Cap One; Goldman Sachs; JPMorgan; MetLife; State Street; USBancorp.	0
Total	**74.6**

According to this exercise, these 10 institutions presented a plan to adjust their capital requirements and this one must be executed by each institution within six months.

The U.S. Treasury, through its Capital Assistance Program (CAP), has placed funding at the disposal of these 10 institutions in an amount equal to not more than two percent of their risk-weighted assets (or more in certain cases) in exchange for mandatory convertible preferred shares. Also is upon consideration the request for the exchange of preferred capital (the one that was previously injected by the authorities) for mandatory convertible preferred shares linked to the CAP. The mandatory convertible preferred shares are the contingent capital, which can be converted at any time into common stock at the issuer's discretion or the holder's choice but under certain conditions, or it can mandatorily de converted to common stock after seven years.

The authorities consider that the use of these shares is temporary, given that the increased transparency regarding the banks' positions will facilitate their access to private capital. In fact, the eight institutions that the SCAP found to be free of the need for additional capital, along with Morgan Stanley, were among the 10 institutions that have proven, to the authorities' satisfaction, that they were able to raise capital and financing without government support. These 10 institutions participating in the Capital Purchase Program (CPP) since October 2008 have met the requirements for repayment established by the primary banking supervisor of each institution.

Public/Private Investment Program

To address the challenge of legacy assets the US Treasury, in conjunction with the Federal Deposit insurance Corporation (FDIC) and the Federal Reserve, has launched the Public – Private Investment Program (PPIP). It seeks to combine private and public capital and complement it with financing either guaranteed or supplied by the government. With this funding, private investors will participate in auctions to acquire illiquid assets. The PPIP has two parts, one for legacy loans already on the books of banks (primarily mortgages) and another for legacy securities (mortgage-backed securities) currently held by insurance companies, pensions funds, mutual funds and other institutions. The general operational aspects for the acquisition of the loans are:

- The bank selects a loan portfolio to sell it and contacts the FDIC, which is in charge of making an auction for such portfolio among the potential investors, this permit the establishment of a market price for these assets. The bank owner of the portfolio may reject the price offered at the auction.
- Private investors inject capital, while the Treasury contributes with a complementary amount which is approximately equal to the one contributed by the first ones.
- In order to leverage the funds of both private investors and the Treasury, the investors create a public-private investment fund (PPIF), which function is to issue FDIC-backed debt. The guarantee has a cost, but it has not yet been defined. The contributed capital absorbs the first losses of the fund. The losses and gains are distributed on a *pari passu* basis between investors and the Treasury.
- The FDIC decides on a leverage ratio for each portfolio according to an assessment made by an independent specialist. The maximum financing that can be guaranteed is 85 percent. This debt is acquired initially by the bank that sells the assets and it can be re-sold later.

In July, authorities announced that during the summer of 2009 they would conduct tests to evaluate how the funding mechanism of this program was working, through the sale of loans from institutions in liquidation.

The second part of the PPIP is focused on the acquisition of securities, the participation of the FDIC as guarantor of the financing will be replaced by direct financing from the Treasury or the Federal Reserve. When the financing comes from the Treasury, one-third of the funds will be from private capital and one-third will be from Treasury financing (in exceptional cases, Treasury financing can amount to one-half of the funding). When the funding comes from the Federal Reserve, it will be channeled through a facility known as TALF, according to the operating rules of that facility.

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1. *Tier 1 common capital*. Common capital is the first tranche of the capital structure for absorbing losses, so it provides protection to the more senior tranches.
2. It is like the exchange of preferred for common stock announced by Citigroup, which includes the resources injected by the Treasury through the CPP.

Box 7

G-20 Recommendations

To address the current crisis, the G-20 has created four working groups to analyze various aspects of the financial system and make recommendations to improve it. The first of these groups focused on enhancing sound regulation and strengthening transparency. Its central recommendations were the following:

i. Supplement the basic mandate of all financial regulators, central banks and supervisory authorities to include financial stability. The International Monetary Fund (IMF) and World Bank must ensure that national authorities comply with this recommendation within the next two years.
ii. Within each country, there should be an effective mechanism for national financial sector authorities to jointly assess systemic risks and coordinate policy responses to avoid their materialization.
iii. Authorities should have appropriate macro-prudential tools for mitigating systemic risks.
iv. The IMF, in consultation with the International Payments Bank and Financial Stability Board (FSB) should prepare guidelines to assist national authorities in determining whether an institution, a market, or a financial instrument is systemically important.
v. The limits of the regulatory framework should be regularly reviewing the light of recent financial innovations.
vi. All credit rating agencies whose evaluations are used for regulatory purposes should be subject to a regime of regulatory supervision that includes registry and adherence to a code of conduct established by the International Organization of Securities Commissions (IOSCO).
vii. Private capital funds, including hedge funds, must be registered with the financial authorities and disclose all appropriate information.
viii. All members of the G-20 must carry out a Financial Sector Assessment Program (FASP). [1] Previously, various countries of the G-20 had not requested assessment through this program.
ix. The FSB and the Basel Committee must develop and implement supervisory and regulatory schemes to mitigate procyclicality in the financial system. Moreover, the accounting standards setters must examine the changes in the corresponding rules to stem adverse dynamics which are associated with fair value accounting.
x. The Basel Committee should develop standards to promote the creation of capital buffers during periods of expansion, which can be drawn down during periods of stress. Additionally, G-20 leaders should support the gradual adoption of the Basel II capital framework.
xi. Supervisors and central banks should deliver a global framework in order to promote a better liquidity risk management at banks.
xii. Major financial institutions should ensure that their remuneration frameworks are consistent with their long-term objectives and with a prudent risk-taking. Simultaneously, prudential supervisors should enhance their oversight on the remuneration systems and take them into account when evaluating those institutions' risk management.
xiii. The accounting standard setters should step up efforts to reduce the complexity of financial instruments accounting and facilitate a convergence toward a single set of high-quality accounting standards.

The second working group made recommendations to reinforce international cooperation and promote the integrity of the financial markets. Among its core recommendations were:

i. Establish supervisory colleges for all major cross-border financial institutions.[2] With this respect, substantial progress has already been made, and most of the largest international banks have such a supervisory college.
ii. National and regional financial authorities should strengthen their regulatory cooperation, share information on possible risks posed to financial stability and ensure that their legal provisions are adequate to address these threats.
iii. Regulators should take all steps necessary to strengthen cross-border crisis management arrangements. On this matter, authorities must review resolution regimes and bankruptcy laws.
iv. Authorities must ensure that temporary measures to restore stability and confidence in financial institutions (e.g., bank debt guarantees) have only minimal distortions and that measures will be unwound in a timely and well-coordinated manner.
v. The FSB must expand to a broader membership of emerging economies. On March 12, it announced that it would broadened its membership to include Argentina, Brazil, China, India, Indonesia, South Korea, and Mexico. Spain and the European Commission will also be members. In addition, Mexico has recently joined the Basel Committee on Banking Supervision (BCBS).
vi. The IMF and FSB must conduct coordinated early warning exercises and realize more efforts to integrate regulatory and supervisory responses into the macro-prudential policy framework.
vii. The authorities should monitor changes in asset prices and their implications for the macroeconomy and financial system.
viii. The authorities should review business conduct rules to protect markets and investors, especially against market manipulation and fraud. In the event of misconduct, there should be an appropriate sanctions regime.
ix. Authorities should implement national and international measures that protect the global financial system from uncooperative and non-transparent jurisdictions that pose risks of illicit financial activity.

The third and fourth working group focused on the reform of the IMF and on the World Bank's role, as well as other multi-lateral development banks. In their reports, they suggested the IMF to enhance its oversight of the financial system and to give emerging markets a greater voice. They also recommended giving a more active role to multi-lateral banks during the crisis, particularly in support of developing countries, and increasing the funding of both the IMF and the World Bank as well as other multilateral banks. As a result of the extension of IMF resources, Mexico obtained a flexible credit line totaling 47 billion dollars. Other groups also made proposals on improving the financial system, among them the Larosiére report[3], the NYU Report[4], the Geneva Report[5], the G30 Report[6] and the Corrigan Report[7]. In general, these reports coincide substantially with the recommendations of the G-20, although each places special emphasis on certain aspects of the global financial system.

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1. The FSAP is a joint exercise of the IMF and the World Bank to assess the financial systems of member countries.
2. Supervisory colleges are collaboration agreements between supervisors of the parent company of an international bank and supervisors of its subsidiaries to promote a better risk assessment, information-sharing and coordination.
3. Larosiére, J., "The High-Level Group on Financial Supervision in the EU", February 25, 2009.
4. Acharya and Richardson, "Restoring Financial Stability: How to Repair a Failed System", NYU Stern School of Business, 2008.
5. Brunnermeier, M., Crocket, A., Goodhart, C., Hellwig, M., Persaud, A. and H. Shin, "The Fundamental Principles of Financial Regulation", ICMB-CEPR, January 24, 2009.
6. G30, "Financial Reform-A framework for Financial Stability", January 15, 2009.
7. CRMPG, "Containing Systemic Risk: The Road to Reform", August 6, 2008.

Box 8

U.S. Financial Regulatory Reform Plan

In June 2009, the U.S. authorities presented a plan to overhaul financial regulation in that country. The reform includes actions in five areas, which are summed up below:

Promote a Robust Supervision and Regulation of all Financial Firms.
According to the U.S. financial authorities, the current supervision and regulation regime for financial institutions suffers from numerous loopholes, weaknesses and duplicated functions. It is also based on an outdated concept of financial risk, because it concerns itself only with the solidity of individual institutions, but fails to take into account the interconnection and relationships between them, or the stability of the financial system as a whole. Oversight has been lax and inconsistent among the various regulators. Many major institutions with high degrees of interconnection have managed to elude consolidated supervision. Accordingly, the authorities proposed:

- The Creation of a Financial Services Oversight Council (FSOC) to supervise systemic risk, which is chaired by the Treasury and integrated also by seven members representing the primary financial regulators: The Federal Reserve, FDIC, SEC, CFTC[1], FHFA[2] and two newly-created agencies: The NBS (which substitutes the OTS and OCC) and the CFPA. This Council will:
  - fill gaps in supervision
  - facilitate coordination of policy and resolution of disputes
  - identify emerging risks in firms and market activities
- All institutions that are systemically significant because of their size, leverage or interdependence with the rest of the financial system, will be regulated and supervised in a consolidated manner by the Federal Reserve. These institutions, defined as Tier 1 Financial Holding Companies (FHC) are not required to own a depository institution.
  - Tier 1 FHCs will be subject to stricter standards of capital requirements, liquidity and management risk.
- The setting of stricter capital and management requirements for all parent companies of financial institutions. Those that own banks will be subject to robust oversight and regulation by the Federal Reserve.
- Two working groups, chaired by the Treasury, will conduct studies and their results will be used for the proposed regulation:
  - Reassessment of the supervision of banks and their holding companies (a report will be submitted in October 2009); and
  - Fundamental reassessment of the design and structure of the existing regulatory capital requirements (a report will be submitted in December 2009).
- A National Bank Supervisor (NBS) will be created, as an agency dependant from the Treasury, to regulate and supervise federally-chartered depository institutions and subsidiaries, as well as foreign banks agencies (assuming the responsibilities of the OCC and the OTS).
- The Office of National Insurance will also be created within the Treasury Department to enhance oversight of insurance institutions.
- Removal of the Federal Thrift Charter because it had provided a loophole for depository institutions with regard to Federal Reserve regulations that are applicable to federally chartered banks.
- Hedge Funds and other private funds must be registered with the SEC.
- Issuance of guidelines and standards by regulators, to ensure that executive remuneration is aligned with long-term shareholder value.
- Firewalls between banks and their affiliates should be strengthened as well as the accounting standards.

Strengthen the Regulation of Critical Markets and their Infrastructure.
The authorities recognize that in recent years, there have been dramatic changes to the financial system infrastructure, with a marked increase in financial activities which are not part of the traditional banking system. The markets for mortgage-backed securities and other assets backed securities, credit default swaps (CDS), repos and lending securities have become critical elements for the financial system. However, regulations have not kept up with the pace of this financial innovation.

- As a result, regulators have been incapable of perceiving and preventing the accumulation of risk, which was a crucial factor in the formation of this crisis. Authorities therefore propose:
- Stronger supervision for asset-backed securities and CDS markets, as well as other derivatives traded on OTC markets.
  - Credit originators must retain at least five percent of the credit risk of securitized exposures.
  - Enhanced transparency and standardization of securitized assets.
  - Strengthen regulation of credit rating agencies.
- Give the FSOC authority to require reports from any U.S. financial institution in order to determine whether its activities imply a risk to financial stability.
- Give the Federal Reserve Authority power to supervise and strengthen the payment infrastructure and clearing and settlement systems.

Provide Greater Protection for Consumers.
The failure to detect the widespread of abusive practices in the subprime mortgage market and the lax regulation of consumer protection have contributed in a significant way to the current financial crisis. The financial crisis revealed that measures to protect investors and consumers were insufficient in a wide range of products and financial markets. Financial products are highly complex and sometimes, even for the most smart consumer, it is hard to identify the risks that these instruments pose. To ensure that consumers have the protection and representation they deserve, the plan proposes:

- Creation of a Consumer Financial Protection Agency (CFPA) to protect consumers of credit, savings and payment transactions, in pursuit of five fundamental criteria: transparency, simplicity, fairness, accountability and access.

Provide the Government with the Tools it Needs to Efficiently Manage Financial Crisis.
In the past two years, the financial system has been threatened by the insolvency of some of its largest and most inter-connected institutions. The capacity of the federal government to manage those cases has been limited by the lack of a regulation that would allow an orderly resolution of a failure of non-bank financial firms. On this matter, it proposes:

- Creating a new authority to address the potential failure of non-bank financial firms that entail a risk to financial stability.
  - This regime will be modeled and supplemented on the existing resolution regime for insured depository institutions under the FDIC Act (P&A, bridge institutions, etc.)
  - Special resolution powers may be invoked by the Treasury upon consultation with the Chairman and the written recommendation of two-thirds of the members of each, the Federal Reserve Board the FDIC's, or SEC's when necessary (a systemic clause that already exists in the FDIC Act).
  - The resolution regime would give the Treasury the authority to appoint either the FDIC or the SEC to act as conservator or receiver of an institution, for which it would have broad powers to sell or transfer assets, assign loans, assume liabilities or inject capital.
- The Tier 1 FHCs must be subject to an early warning regime, which will be similar to the one applicable to banks. Each Tier 1 FHC must provide the Federal Reserve, and continuously update, a credible resolution plan for its execution, in the event of severe stress.

Improve International Cooperation and Regulatory Standards.
The crisis has shown that problems in the financial system of any country can be spread quickly and easily across the global financial system. Regulations have basically a domestic scope, while financial markets today have assumed global dimensions. Under these circumstances, international cooperation is imperative, so U.S. authorities propose a series of actions which are consistent with the G-20 agenda[3].

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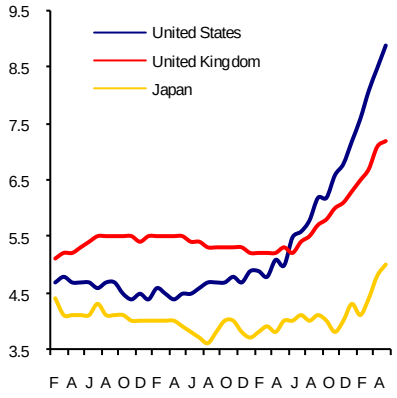
1. *Commodity Futures Trading Commission.*
2. *Federal Housing Finance Agency.*
3. See Box 7.

One of the corollaries of the deterioration in the economic activity of developed economies has been rising unemployment rates. The strength and timing of the impact has varied among countries in accordance with labor market characteristics (Graph 7a). Unemployment plays a fundamental role in the economic impact of the crisis because it affects aggregate consumption, thus further weakening economic activity.

One of the channels through which the financial crisis has spread globally has been international trade. The reduction in wealth and credit brought on by the crisis contributed to a pass-through of its effects from the financial sector to the real sector. Both led to a sharp contraction in demand for goods across international markets, clearly evidenced by the trend in the value of trade of the world's leading exporters and importers (Graph 7b and c), as well as maritime transport costs (Graph 8a). The contraction in global demand for goods has translated into a slower rate of economic activity in producer countries, magnifying the recessive effects of the contraction in domestic demand within those economies.

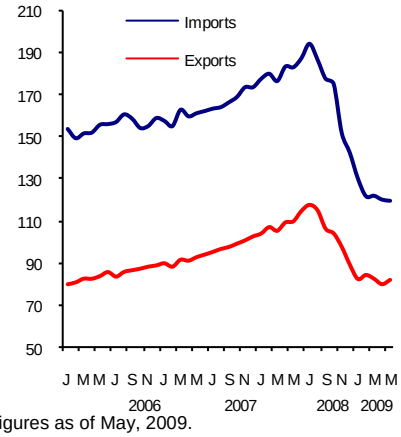
Graph 7
Unemployment Rate and International Trade

a) Unemployment Rate of Developed Countries



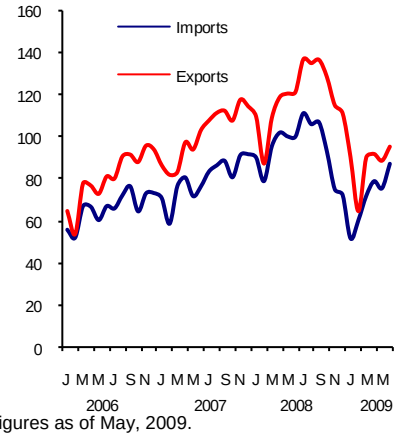
Figures as of May, 2009.
Source: Bloomberg.

b) United States International Trade



Figures as of May, 2009.
Source: Bloomberg.

c) China's International Trade



Figures as of May, 2009.
Source: Bloomberg.

Another channel through which the financial crisis has spread is commodity prices, energy in particular. The sharp drop in demand for goods from the most advanced economies has given rise to rapid inventory accumulation in diverse industries, especially in the manufacturing sector. This has translated into a rapid decrease in production and a severe contraction in demand for commodities.

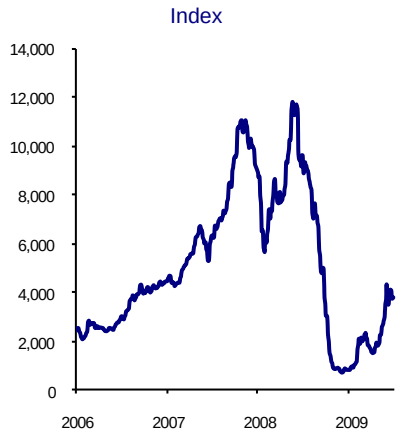
Before the financial crisis, commodity prices in general showed a strong uptrend. However, during 2008 they suddenly began to fall, reflecting new economic conditions. Diverse indicators at the time of writing appear to confirm that the global economy is on a moderate recovery path. Industrial output figures for China and Japan have contributed to putting commodity prices back at levels similar to those observed at the beginning of 2007 (Graph 8b).[10] Graph 8c shows

[10] In the case of farm good prices, factors other than the financial crisis, such as changes in harvest volumes, have played a key role in their recent trend.

the impact of the decline in economic activity on the world's main stock markets as well as their recovery following the release of better economic data.

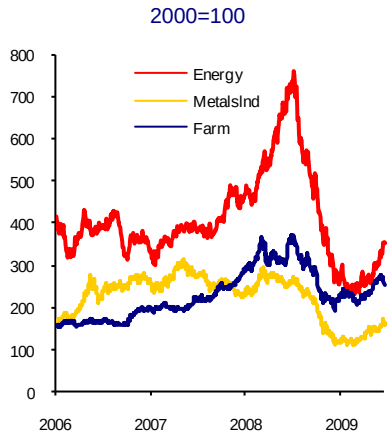
Graph 8
Transport Costs, Commodity Prices and Stock Market Indices

a) Baltic Dry Maritime Cost of Transport Index



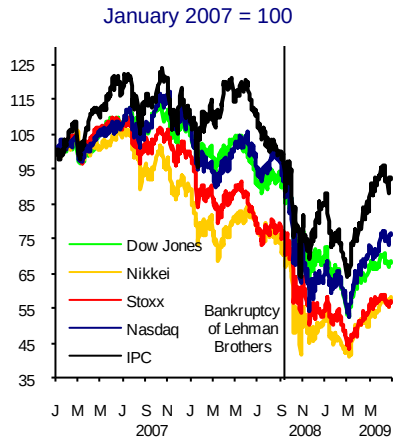
Figures as of June, 2009.
Source: Bloomberg.

b) Commodity Price Indices



Figures as of June, 2009.
Source: Bloomberg (Dow Jones AIG Spot Index).

c) Stock Market Indices



Figures as of June, 2009.
Source: Bloomberg.

The sharp decrease in commodity prices and fall in the rate of economic activity have given rise to much lower global inflation, which only a year ago was cause for concern (Graph 9a). Although inflation has come down in both advanced economies and emerging ones, absolute levels of inflation are considerably lower in the former. Some experts even forecast that a decrease in the consumer price indices of the United States and Japan in 2009 could lead to deflation.[11] However, deflation fears have eased following the release of economic data which signals the beginning of an economic recovery.

The rapid slump in international trade, fall in commodity prices and decrease in the inflation rates of the world's most advanced economies have had huge repercussions on emerging economies, especially ones with manufacturing or commodity export advantages, leading the monetary authorities of the former to apply an unprecedented monetary stimulus led by the United States (Graph 9) to re-start economic growth. The next section looks at the impact of the crisis on emerging economies.

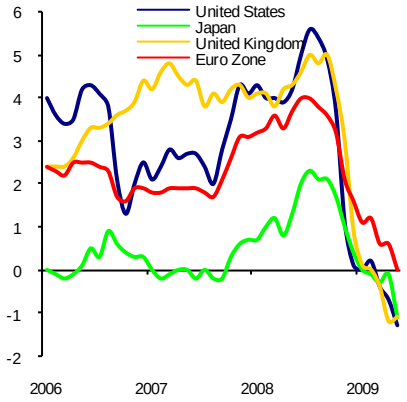
The recent publication of several economic indices appears to confirm an incipient global economic recovery. Likewise, there has been some portfolio restructuring by institutional investors and leveraged funds in favor of riskier assets. However, the economic recovery will not be sustainable until the domestic demand of the world's main developed countries recovers. The weakness of their financial systems and deleveraging processes among their institutions could be a drag on this recovery process. Furthermore, greater financing needs in the United States have put pressure on interest rates at the long end and in the middle of the yield curve (Graph 9c).

[11] See Box 2 in Banco de México's January-March 2009 Inflation Report.

Graph 9
Consumer Price Indices and Interest

a) Advanced Economy Consumer Price Indices

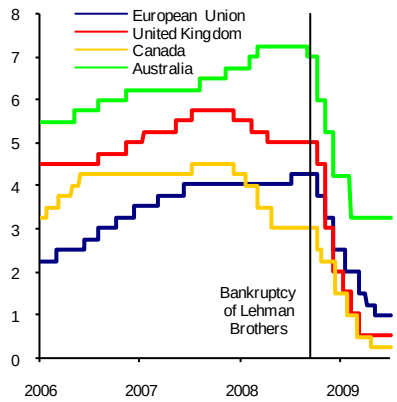
Real annual change in percent



Figures as of May, 2009.
Source: Bloomberg.

b) Monetary Policy Benchmark Rates

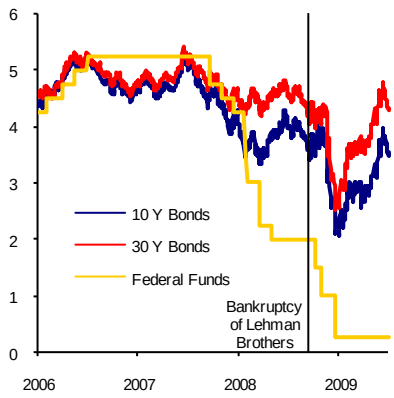
Percentage



Figures as of June, 2009.
Source: Bloomberg

c) US Treasury Bond Yields and the Federal Funds Rate

Percentage



Figures as of June, 2009.
Source: Federal Reserve

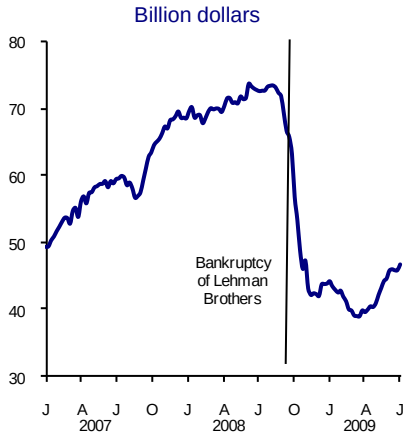
Impact on emerging economies

As we remarked earlier, the financial crisis did not initially have any major impact on emerging economies. At one point, mention was even made of a decoupling from developed countries and events elsewhere in the world on the presumption that the wide interest margins most emerging market banks had taken advantage of had dissuaded them from investing in riskier assets. This contrasted with the situation US and European banks were in. The application by many developing countries of tight fiscal and monetary policies aimed at improving the regulatory framework and oversight of their financial entities was also an influencing factor. Consequently, when the crisis began, emerging economies found themselves in a relatively sound position, which enabled them to cope, albeit temporarily, with the international financial turbulence.

However, the worsening of the crisis had major effects on developing economies, which were transmitted through diverse channels. The bankruptcy of Lehman Brothers in September 2008 and lack of clarity about the use of funds from the United States' financial system bailout program triggered a massive asset sell-off. Consequently, during the fourth quarter of 2008, investment inflows to emerging economies suddenly shrank (Graph 10a). At the same time, the increase in risk aversion globally was reflected in big increases in credit default derivatives (Graph 10b). This period also saw a significant expansion of emerging economy sovereign debt and US Treasury yield spreads (Graph 10c).

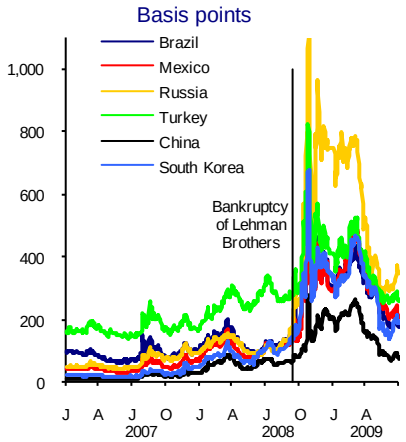
Graph 10
Impact on Emerging Economies

a) Emerging Market Fund Inflows



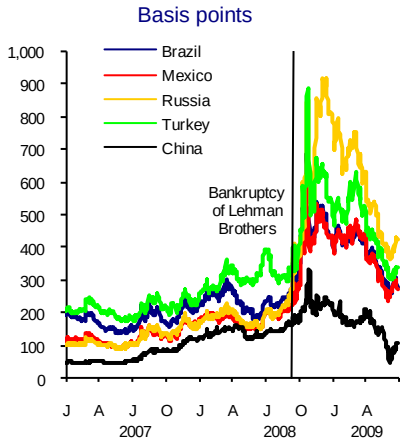
Figures as of July, 2009.
Source: Emerging Portfolio.

b) Emerging Market Credit Default Derivatives



Figures as of June, 2009.
Source: Bloomberg.

c) Emerging Markets Bond Index (EMBI)

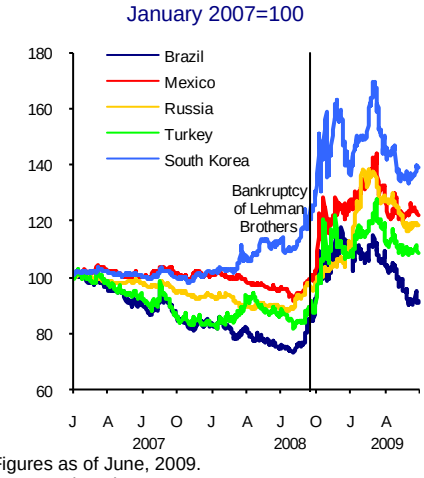


Figures as of June, 2009.
Source: Bloomberg.

The massive asset sell-off impacted emerging economies' exchange rates, domestic interest rates and stock markets (Graph 11). Consequently, during the final quarter of 2008, emerging market currencies succumbed to sharp depreciations as investment fund flows receded. At the same time, medium and long-term interest rates suddenly rose as investors sold positions to meet liquidity needs. Thus stock market indices, which had already begun a downtrend, accelerated their declines in response to a much weaker economic outlook.

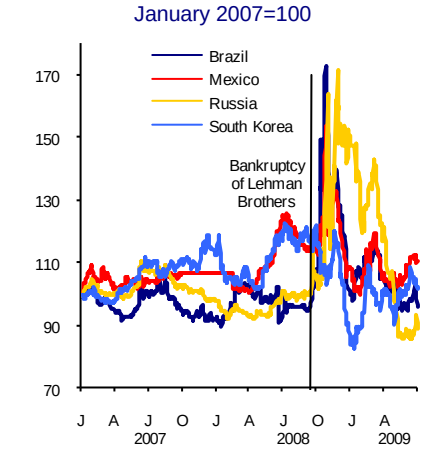
Graph 11
Impact on Emerging Economies

a) Exchange Rates



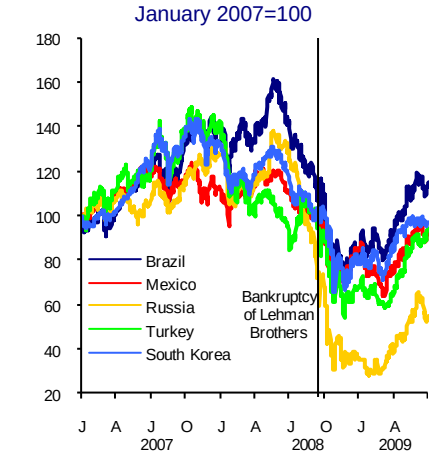
Figures as of June, 2009.
Source: Bloomberg.

b) Long-Term Government Bond Yields (10Y)



Figures as of June, 2009.
Source: Bloomberg.

b) Stock Market Indices



Figures as of June, 2009.
Source: Bloomberg

Similar to developed countries, the prolonged period of macroeconomic stability and abundant liquidity which preceded the crisis resulted in some economic agents in emerging markets underestimating exchange rate risk. These circumstances encouraged some non-financial companies to assume excessive

risks related to derivative transactions in a bid to obtain additional gains to those of their main businesses.

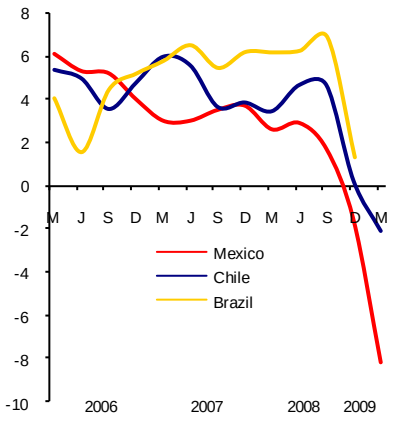
Therefore, the depreciation of exchange rates against the dollar had an added and surprise impact on some emerging economies resulting in significant losses for some companies located mainly in South Korea, Brazil and Mexico.[12] These losses compounded instability and uncertainty in these economies, as companies which found themselves in this situation were forced to obtain funds at a time when credit was contracting. Likewise, and within days, foreign exchange markets witnessed sudden and unexpected demand for dollars. In some countries this situation forced the financial authorities to intervene to stabilize the market (see the section Financial Markets).

However, it was lower fund inflows that had the biggest impact on emerging markets, an impact which ranged from lower remittances from advanced economies, a decrease in international trade and a fall in commodity prices, to an increase in credit risk globally. These factors contributed to weakening consumption and private investment leading banks in those economies also to restrict credit. Thus, these economies, especially major exporters of manufactured goods or commodities, saw demand plunge, which was very quickly reflected in a slowdown of economic activity (Graph 12).

Graph 12
Gross Domestic Product

a) Mexico, Chile and Brazil

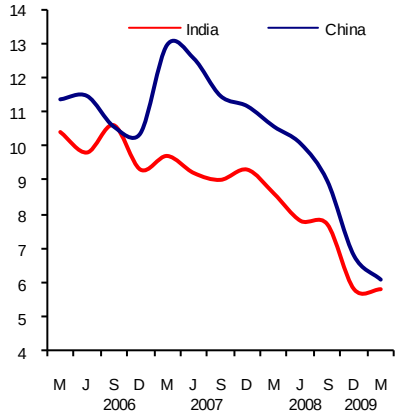
Real annual change in percent



Figures as of March, 2009.
Source: Bloomberg.

b) China and India

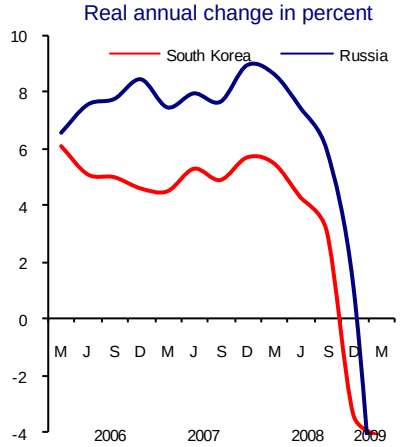
Real annual change in percent



Figures as of March, 2009.
Source: Bloomberg.

c) Russia and South Korea

Real annual change in percent



Figures as of March, 2009.
Source: Bloomberg.

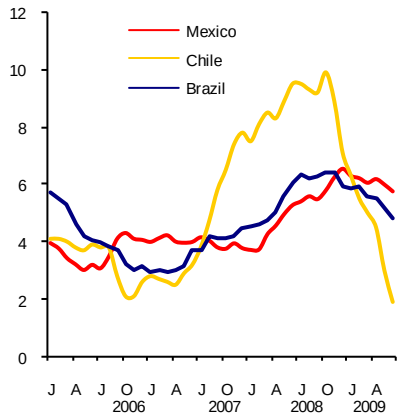
Finally, in contrast with the inflation of advanced economies, in emerging economies this variable has shown a mixed trend. Following a sharp rebound due to a rise in commodity prices, in some economies inflation has eased, especially in China where the use of commodities in economic activity is less intense. In contrast, in other emerging economies such as Brazil, India, Mexico and Russia, inflation is only just beginning to come down (Graph 13).

[12] Companies in Indonesia, Malaysia, China, Sri Lanka, India and Poland were also affected by very similar circumstances. These companies were hurt by derivate-related transactions in which the value of the dollar was the underlying asset.

Graph 13
Consumer Price Index

a) Mexico, Chile and Brazil

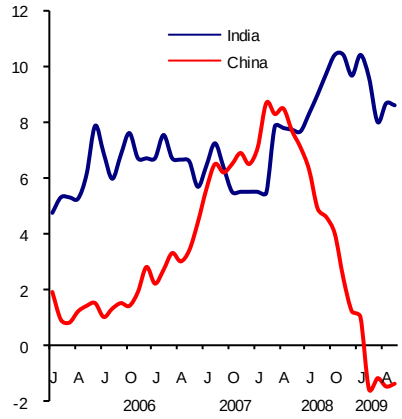
Real annual change in percent



Figures as of June, 2009.
Source: Bloomberg.

b) China and India

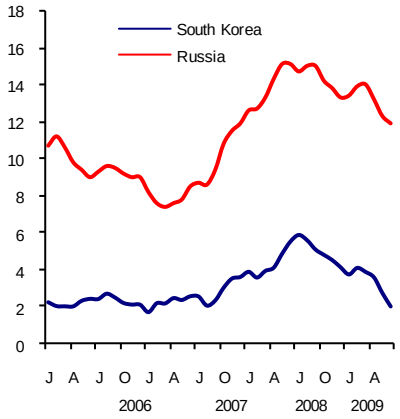
Real annual change in percent



Figures as of May, 2009.
Source: Bloomberg.

c) Russia and South Korea

Real annual change in percent



Figures as of June, 2009.
Source: Bloomberg.

The recent crisis has exposed the vulnerability of economies with financial systems which at given point in time expanded credit using foreign funds. This is also the case of economies in which the size of banks' balance sheets exceeds gross domestic product. Some countries, such as Central and Eastern European ones, are a good example of the former situation. Banks in those countries captured a huge amount of funds from abroad in order to grant Swiss franc and euro-denominated mortgage loans. The total amount of foreign currency-denominated loans as a percentage of non-banking private sector total loans is above 55 percent in Croatia and Hungary while in countries like Poland and the Czech Republic, levels are around 25 percent and 10 percent, respectively.[13] The currencies of some of these countries have experienced strong depreciations, especially as of the second half of 2008. Exchange rate devaluation undoubtedly increases the value of foreign currency-denominated debt and therefore default indices with the consequent impact on their banking systems.

In the second situation are economies where banks' individual assets are similar to or larger than the gross domestic product of the country they are located in. Given their size, institutions in these circumstances could be susceptible to a government bailout should they face difficulties. However, the amount of funds required to bail them out could threaten the very solvency of the country in question. It could also set a bad precedent for promoting good banking practices in the future. Iceland is a clear example of the complexity of this problem, and other small economies are not immune (Box 8).

[13] Source: Austrian Bank, Financial Stability Report, December 16, 2008.

2.3. Impact on Mexico

The international crisis was transmitted to the Mexican economy through the same channels it reached other emerging economies. The slowdown in the economic activity of the world's main economies and reduction in international trade as well as a fall in energy prices had an unfavorable impact on Mexico. However, the domestic economy's high degree of dependence on the US economy has made the contagion via the real sector particularly severe.

When the first signs of the international financial crisis emerged, Mexico was estimated to be in a much more solid position than in the past, and so the fall-out from the crisis was not expected to be as harsh. In particular, it was noted that greater export diversification, dynamic private sector bank financing and the fact US industrial sector activity had not contracted would enable the domestic economy to maintain a modest growth pace.

Furthermore, unlike in the case of numerous US or European-based banks, the balance sheets of Mexican-based banks did not include assets related to the US mortgage market (the so-called "toxic assets"). Likewise, no one stopped to think that troubled foreign institutions could have a contagion effect on the Mexican financial system despite some of them being the parent companies of Mexican-based banks. This is because Mexican legislation places strict limitations on banks' operations with related parties.[14] However, as discussed, the massive asset sell-off which followed the bankruptcy of Lehman Brothers and uncertainty arising from a lack of clarity about the precise use of emergency funds to support the US financial system, pushed up interest rates and triggered devaluations of emerging economy currencies.

In the specific case of Mexico, the real sector was the main contagion vehicle. The slowdown in the rate of global economic activity and drop in commodity prices has brought about a drastic change in the terms of trade. The special characteristics of the Mexican economy have resulted in some of these shocks having a particularly negative effect. For example, the slowdown in global economic activity has affected all economies that are open to international trade. However, as Mexico is highly dependent upon the United State for foreign trade, especially where manufacturing exports are concerned, the slowdown in US economic activity has had on the Mexican economy adverse effects. Furthermore, and as is usually the case during big international crises, problems popped up in unexpected places, specifically, on the balance sheets of several private companies.

The prolonged period of macroeconomic stability Mexico has enjoyed in recent years led to some private companies underestimating financial market inherent risks and taking inappropriate risks. Some leading companies had huge amounts of money tied up in risky foreign exchange and interest rate derivatives.[15] For several years, exchange rate stability had enabled these companies to make huge profits from such transactions, but the sharp depreciation of the peso in the fourth quarter of 2008 triggered a rapid deterioration in their financial situation.

[14] The Credit Institutions Law (Ley de Instituciones de Crédito) states that banks' operations with related parties may not exceed 50 percent of the Tier 1 capital of their regulatory capital.

[15] This situation also occurred in other emerging economies including South Korea, Brazil, Indonesia, Malaysia, China, Sri Lanka, India and Poland.

Box 9

When a Bank's Assets Are Greater Than the GDP of its Home Country

The global process of financial deregulation has been accompanied by a sharp rise in cross-border lending and fundraising. There are several banks that manage and have assets (and liabilities) in amounts well above the country's GDP. For instance, in Iceland, where the population reaches 320,000 individuals, the largest banks manage assets equivalent to several times the country's GDP (see table).

Banks' Assets as Percentage of the Country's GDP

Country	Bank Name	GDP 2007 (€bn)	Total Assets 2007 (€bn)	Total Assets/GDP 2007 (%)
Switzerland	UBS	309	1,372	444
Iceland	Kaupthing	14	59	417
Holland	ING	473	1,370	290
Switzerland	Credit Suisse	309	821	266
Belgium and Luxembourg	Fortis	349	886	254
Cyprus	Bank of Cyprus	13	32	253
Iceland	Landsbanki	14	33	237
Iceland	Glitnir	14	20.7	230
Belgium and Luxembourg	Dexia	349	605	173
Spain	Santander	693	913	132
United Kingdom	RBS	1,645	2,079	126
Holland	Rabobank	473	571	121
France	BNP Paribas	1,624	1,694	104
Ireland	Bank of Ireland	180	183	102
Belgium and Luxembourg	KBC	349	356	102
Ireland	Allied Irish	180	178	99
United Kingdom	HSBC	1,645	1,608	98
United Kingdom	Barclays	1,645	1,542	94
France	Credit Agricole	1,624	1,414	87
Germany	Deutsche Bank	2,237	1,917	86
Austria	Erste Bank	242	206	85
Italy	Unicredit	1,285	1,022	80
Iceland	Straumur	14	6	73
Spain	BBVA	693	502	73
Portugal	Millennium BCP	132	88	67
France	Socgen	1,624	1,072	66

Source: Banco de México and Eurostat; KBW; IMF; Financial Times "*Are European banks too big to fail?*", September 30, 2008.

During the period 2004-2008, Icelandic banks' assets jumped from one hundred to one thousand percent of the country's GDP. During the same period, the rates of consumption and leverage of Icelandic homes and companies significantly increased. Much of that debt was denominated in foreign currencies. In fact, the build-up of leverage in Icelandic banks took substantial amounts of cash from overseas (primarily Euros and Swiss Francs) to fund loans denominated in the same currencies to Icelandic residents, at interest rates lower than those prevailing for local-currency denominated loans. The economic deterioration of Scandinavian countries and the United Kingdom (where Icelandic banks operate) drove up the cost of funding for Icelandic banks and prevented them from refinancing their foreign-currency denominated liabilities. According to the International Monetary Fund, these liabilities rose up to 462 percent of GDP of which 70 percent was short-term debt. In addition, the market perceived that the size of the Icelandic banking system compared to that of the economy, posed an additional risk, because the government would be unable to support banks should they go bust. As a result, investors reduced their risk positions in both financial and non-financial firms. At the same time, some foreign depositors withdrew their deposits in Icelandic banks and this action suppressed the credit flow to the country's households and companies. Consequently, in the second half of 2008, the Icelandic krona lost more than 85 percent of its value against the euro and its stock market plunged by more than 75 percent. Moreover, Landsbanki, the second largest Icelandic bank in terms of assets and with a strong presence in the United Kingdom, suffered a bank run on its United Kingdom branches when it became clear that other Icelandic banks were in trouble. On October 7, 2008, the Icelandic government took control of Landsbanki and Glitnir banks and announced that it would protect all Icelandic residents' deposits, but would provide a limited protection to overseas depositors, this in accordance with the European deposit insurance scheme criteria (i.e. 20,000 euros). The British government questioned the discriminatory treatment of clients residing in the United Kingdom and announced a freeze order on the assets of Landsbanki's British branch (Icesave), by invoking British anti-terrorism laws.[1]

Landsbanki bank also operated in the United Kingdom through a subsidiary: Heritable Bank Public Ltd. Through an emergency legislation (the Banking Special Provisions Act of 2008), the British government transferred all retail deposits from Heritable to ING Direct. Even though this subsidiary has been subject to a precautionary intervention, the bank is still operating.

The British government began immediately a precautionary intervention in the British subsidiary of Kaupthing (Kaupthing Singer & Friedlander). The measures adopted by the British authorities prevented the parent company from fulfilling its obligations. The Icelandic government was then forced to take over the parent company. In Sweden, on the same day, the central bank provided extraordinary liquidity to Kaupthing's Swedish subsidiary (Kaupthing Bank Sverige AB) in the amount of 730 million dollars. This support was granted on the basis of the solvency rating assigned by a supervisory authority. Among other guarantees, the central bank demanded that all shares issued by the Swedish subsidiary were posted as collateral. The purpose of the loan was to deal with the liquidity problem and so avoid a contagion to the rest of the Swedish banking system. On March 2009, the subsidiary was sold to a Finnish bank and the special loan from the central bank was repaid in full.

The purpose of the measures adopted by the British government was to protect depositors and taxpayers. Other countries have also introduced legislation to protect their citizens when they make deposits in local branches of foreign banks. These measures allow the freezing of assets of foreign bank's branches when those banks face solvency problems. This process is known in the specialized literature as ring-fencing of assets. Upon taking control of its three largest banks, the Icelandic government injected capital equivalent to around 30 percent of the GDP. In addition, the government reorganized the banking system into "new banks," those that provide local banking services and "traditional" banks, which would negotiate most of the overseas liabilities. It also introduced an exchange-rate control mechanism and raised interest rates. The short-term purpose of these measures was to stabilize the krona.

The total cost of the banking bailout was estimated at around 6 billion dollars. On October 24, 2008, the IMF announced an emergency financing package under which it would contribute 2.1 billion dollars. A number of countries have announced their intention of contributing to the program. The United Kingdom, Holland and Germany have been very emphatic in demanding that the deposits of thousands of their citizens in Icelandic banks be fully supported by the government. After an intense period of negotiations, the IMF's final support plan was made conditional upon protection of the deposits of foreign residents, in accordance with European Union guidelines. The cost of the bailout is estimated at about 85 percent of Iceland's GDP. It is also expected that this country's GDP will shrink by 10 percent and that at the end of 2009, the budget deficit will rise to 13 percent of GDP. On the other hand, its long-term sovereign debt rating was dramatically reduced. The debt represents 108 percent of GDP. It is clear that in such cases like Iceland's, the country's capacity to support its own banks turn out to be very limited. As a result, it is important that financial authorities have in place mechanisms to avoid this type of scenario. Moreover, the disagreement between the United Kingdom and Iceland makes it clear the need for governments to strengthen the schemes for managing cross-border crises, including reciprocal communication and cooperation agreements. The G20 recognizes the importance of these challenges and to this end, with the support of the Financial Stability Forum, has taken the initiative on this issue.

1. The law states that a branch does not have an independent legal status from its parent company. Instead, a subsidiary does have its own legal status which is different from its parent company and thus is subject to the laws of the country in which it resides.

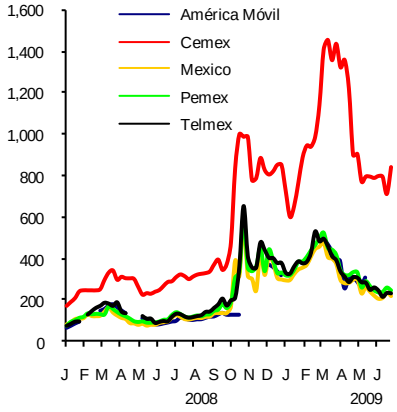
The disclosure of some of these practices only added to the prevailing uncertainty in equity markets, especially as participants were unaware of the identity of all of the companies involved as well as the true size of the losses. This situation made it even more difficult for domestic companies to tap international markets for financing. As a result, in the case of some public and private Mexican companies, during October and November 2008 margins on credit default swaps[16] increased between 400 and 600 basis points (Graph 14a), thus increasing the cost of external financing.

The risk-adverse environment prevailing in international markets spread to the Mexican market where it had a disruptive effect on the commercial paper market, so much that several domestic companies began to have problems refinancing their debt maturities while others were faced with increases of up to 300 basis points in the cost of credit (Graph 14b). The shortening of financing terms from banks and debt markets (Graph 14c) was an exacerbating factor.

Graph 14
Credit Default Swaps and Credit Restrictions

a) Mexican and Corporate and Sovereign Bond Credit Default Swaps

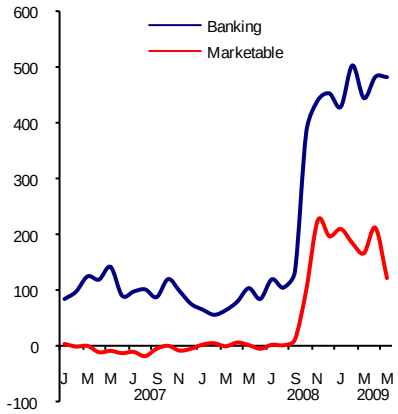
Basis points (weekly average)



Figures as of June, 2009.
Source: Bloomberg.

b) Mexican Companies' Cost of Financing. Spread Versus 28d TIIE[1/]

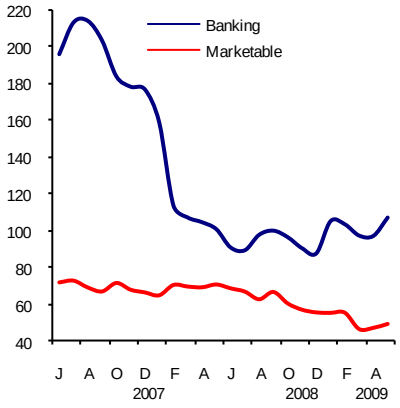
Basis points



Figures as of May, 2009.
Source: Banco de México.
1/ Only considers companies that issued commercial paper in 2007 and 2008.

c) Mexican Companies' Financing Term[1/]

Average number of days



Figures as of May, 2009.
Source: Banco de México.
1/ Only considers companies that issued commercial paper in 2007 and 2008.

Consequently, Mexican companies saw their ability to tap external financing greatly reduced (Graph 15a). This, together with greater risk aversion, forced many companies to resort to credit lines with Mexican banks (Graph 15b). The increase in the cost of funds in international markets and climate of general uncertainty made these lines more expensive (Graph 15c).

The situation unleashed by derivative transactions has given rise to a series of important questions. The fact that some Mexican companies had

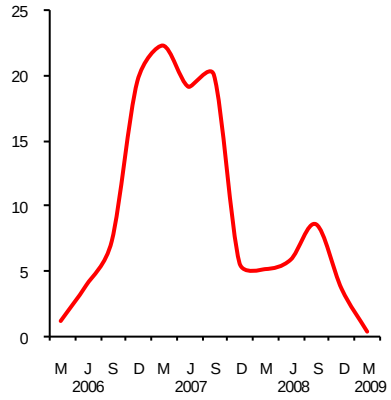
[16] It should be recalled that credit default swaps are financial instruments which in the event of default on the part of the issuer give the holder the right to sell the related bonds at nominal value. To be entitled to do so, holders of these instruments must make periodical payments to the issuer during the life of the secured bonds. The sum of the one-year payments expressed as a percentage of the nominal value of the bond is known as margin, which is like an insurance premium. Thus an increase in margin automatically reflects the perception of increased default risk.

acquired financial instruments capable of putting their solvency at risk, that the market was not punctually and properly informed of these risks and that partial disclosure of this information exacerbated risk aversion, has underscored the need to improve the transparency and timeliness of information disclosed by private companies which issue securities in capital markets (see the section Financial Markets).[17]

Graph 15
Financing to Non-Financial Private Firms

a) External Financing of Mexican Companies

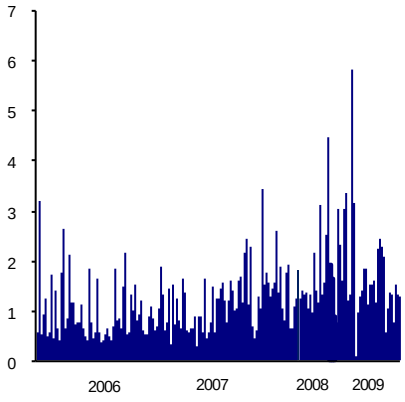
Annual change in the dollar balance in percent



Figures as of March, 2009.
Source: Banco de México.

b) Bank Loan Drawdowns by Larger Firms

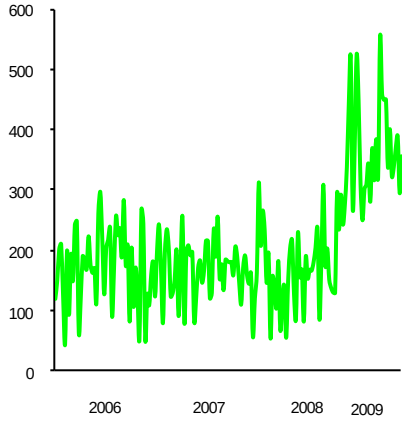
Billion pesos



Figures as of May, 2009.
Source: Banco de México.

c) Interest Rate on Bank Credit Lines, Six Largest Banks

Basis points versus 28d TIIE



Figures as of May, 2009.
Source: Banco de México.

The current international financial crisis has not only affected financing conditions for private and public Mexican firms, but also for financial intermediaries and the Federal Government. The intensification of risk aversion and reduced liquidity in debt markets were reflected, for example, in an increase in the spread between the yield on Federal Government bonds and the medium-term (3 and 5 year) bonds of the Bank Deposit Insurance (Instituto para la Protección del Ahorro Bancario, IPAB), due mainly to the difference in liquidity (Graph 16a). Meanwhile, the yield on public debt with a maturity of one year or more increased as of the last quarter of 2008 (Graph 16b) and the yield curve has tended to steepen (Graph 16c).

The impact of the crisis on economic activity

Amid an adverse international environment during the first nine months of 2008, economic activity in Mexico began to lose steam as external demand weakened. In the fourth quarter of 2008 and the first quarter of 2009 in particular, exports shrank due to an economic slowdown in the world's main developed countries (Graph 17a). As explained below, weaker external demand has been reflected in domestic demand components. Consequently, the Mexican economy experienced real decreases in growth in October, November and December of 2008, a trend that was exacerbated during the first quarter of 2009 (Graph 17b). It is worth noting that although public spending, particularly investment, maintained

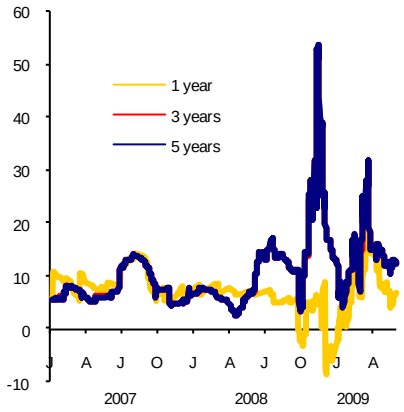
[17] Publicly-listed companies are required to disclose information to the public every so often as well as to inform the market of relevant events. However, the information disclosed failed to specify the risks that were being taken.

a positive trend, domestic demand contracted due to a slump in private spending and investment in Mexico.

Graph 16
Interest Rates in Mexico

a) Spread Between the Yield on Federal Government and IPAB Bonds

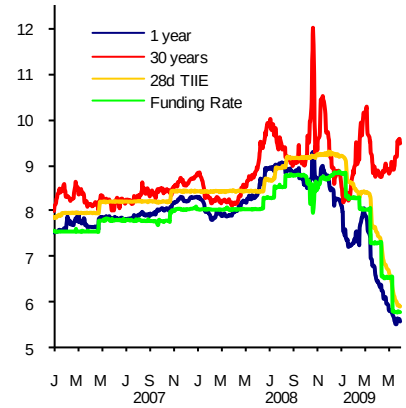
Percentage points



Figures as of June, 2009.
Source: Valmer.

b) Interest Rates on Different Maturities

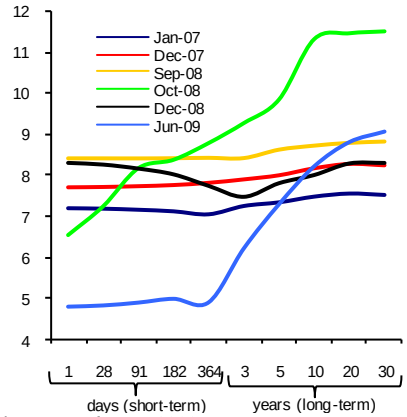
Percentage



Figures as of June, 2009.
Source: Banco de México and Valmer.

c) Government Bond Yield Curve

Annual change in percent



Figures as of June, 2009.
Source: Valmer.

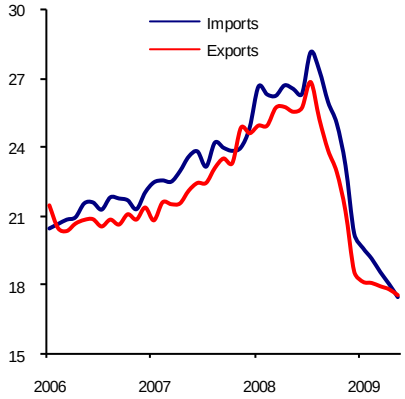
There are four reasons for the drop in private spending: i) a sharp decrease in formal employment (Graph 17c), given lower industrial and manufacturing output due to lower external demand for Mexican goods; ii) a decrease in corporate financing in debt markets (both domestic and foreign); iii) a tightening of bank credit flows to the private sector, from consumer and mortgage loans to corporate loans; and iv) a strong decline in stock market indices due to the international crisis. The combination of these four factors caused a contraction in both consumption and private investment.

Finally, at the end of April, beginning of May 2009, there was an outbreak of influenza in several cities in Mexico, which triggered an international epidemiological alert that required emergency measures to stop the virus from spreading. These measures included the suspension of classes at all levels of education, a decrease in activity or stoppages at government entities and private firms and the temporary suspension of activities in public places. These measures brought many types of economic activities to a standstill for several days, especially in the retail and services sectors, further worsening domestic economic activity in the second quarter of 2009. Nevertheless, the economic cycle is expected to stabilize as of the third quarter of the year (Box 10).

Graph 17
Indicators of Economic Activity in Mexico

a) International Trade

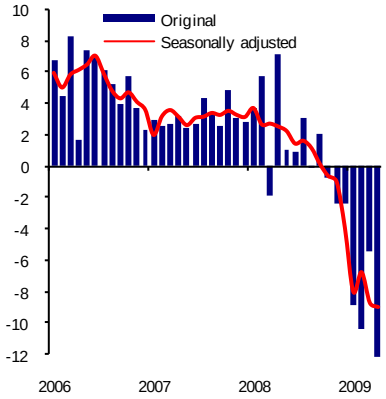
Billion dollars, seasonally-adjusted data



Figures as of May, 2009.
Source: Banco de México.

b) Global Indicator of Economic Activity

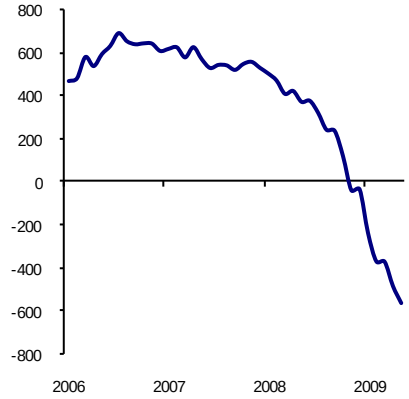
Annual change in percent



Figures as of April, 2009.
Source: INEGI.

c) Formal Employment in Mexico

Annual change in thousands of persons



Figures as of May, 2009.
Source: IMSS.

Measures adopted by Mexico to face the crisis

The first measures adopted in Mexico to face the crisis were implemented in March 2008 with the Federal Government's announcement of the Economic Support Program, which contemplated various fiscal measures. Since then, numerous measures with a more precise focus and greater scope have been announced to tackle a problem which has grown in complexity and depth. Overall the main aim of the measures has been to stimulate economic activity and stabilize the functioning of financial markets (Box 11). In relation to the latter, those taken with respect to the foreign exchange market are worth highlighting.

In Mexico, as in other emerging economies, the foreign exchange market came under liquidity pressures related to asset sell-offs in response to risk aversion and overall de-leveraging. Furthermore, the third quarter of 2008 saw a strong increase in demand for dollars from some companies in order to cover derivative positions in that currency. Finally, the deterioration in the external revenue sources of these economies amid a credit crunch in international financial markets, added to uncertainty regarding their ability to finance current account deficits.

Box 10

Economic Effects of an Influenza Epidemic

In 2003, the World Health Organization, following the outbreak of the Severe Acute Respiratory Syndrome (SARS), issued warnings on the risks that a new pandemic, particularly a pandemic influenza outbreak[1] could pose to public health and economies. Although, it is very difficult to predict the damage impact of an influenza pandemic in a population, the WTO, based on its experience of the pandemic influenza of 1968 (that was considered as being mild), estimated that a new pandemic might result in 2 to 7.4 million deaths. This is because mortality rates depend on the severity and patterns of spread of the virus, the number of cases, persons infected characteristics (like group age) and the effectiveness of preventive measures taken by public health authorities.

On April 2009, in Mexico, the A/H1N1 virus outbreak brought back the importance of WTO's proposals. Public health authorities of Mexico and other countries took immediately measures. Most often, the costs related to the execution of preventive measures (still if those are perceived as exaggerated) are much lower, even though the virus turns out to be relatively harmless, than the ones generated later, by delaying measures, if the virus resulted to be too severe.

The most notorious pandemic outbreaks of modern times occurred in 1918 (the Spanish flu), 1957 (the Asian flu), 1968 (the Hong Kong Flu) and 2003 (SARS). Table A shows some characteristics of each of these.

Table A
Contrast of the Most Known Pandemics of the 20th and 21st Centuries

Historic Pandemics	Affected group	No. of waves	Mortality rate (percent)	No. of deaths	Regions affected
Spanish flu (1918-19)	15-44 years old	3	2-2.5	40-50 million	Untied States, Europe, India, Australia and New Zealand
Asian Flu (1957-58)	Children, students, and older persons	2	0.03	2 million	China, Hong Kong, Singapore, some regions of Europe, North America, Russia and Japan
Hong Kong Flu (1968-69)	Children, students, and older persons	0	0.03	1-3 million	China, Hong Kong, United States, Europe, South America and South Africa
SARS (2003)	Particulary older persons with chronic illness	0	10	800	China, Hong Kong, Singapore, Vietnam, and to a lesser extent another 26 countries and 3 regions

Source: World Health Organization; Health Protection Agency of the United Kingdom; MacKellar, L. (2007), "Pandemic Influenza: A Review", Population and Development Review, 33 (3) pp. 429-451 and Brainerd, E. (2003), "The Economic Effects of the 1918 Influenza Epidemic", CEPR Discussion Paper No. 3791.

The magnitude of a pandemic's effects on economic activity depends on its duration and the amount of work absenteeism that it causes. Analysts who studied the SARS epidemic believe the negative impact on economic activity tends to focus on given sectors, such as tourism, retailing and transportation (see table B), and that these effects last for relatively short periods of time.[2]

The economy often recovers rapidly when the economic effects of an epidemic are reflected in a reduction of demand because of uncertainty rather than a depletion of productive facilities.[3]

Table B
Negative Effects of SARS Pandemic in Asia

Change in percent

	Hong Kong	Asian Region
No. of tourists	-10.4	From -20 to -71[1]
Retail sales	-15.2	From -10 to -51[1]
Estimated impact on GDP	-1.8	-0.6
Public transportation passengers	Between -10 and -20	NA

Source: IMF-Asia and Pacific Regional Economic Outlook, May 2006; Siu A. and R. Wong (2004), "Economic Impact of SARS: The Case of Hong-Kong", Asian Economic Papers 3:1 MIT Press and Xiaoquin, E. (2004), "SARS: Economic Impacts and Implications", Asian Development Bank.

Measures to stem the spread of a pandemic can also have additional effects, such as:[4]

i. Risk aversion, which may spur greater demand for liquidity, particularly in cash or low-risk financial assets.
ii. Decline in net capital flows from overseas and a rise in the rate of return on financial securities of companies and markets located in the affected country.
iii. Indirect effects, particularly in the banking system. The deterioration of economic activity and loss of jobs can diminish households and firms' capacity to cover their debts. In a second phase, it may increase the rate of loan defaults and thus deteriorate bank's balance sheets. In order to prevent a further impact on the economy, it is important to ensure that this does not translate into a restriction of lending.

The WTO has established a scale of pandemic alerts as a tool for the adoption of measures to counter the risks involved in the outbreak of a global epidemic. The WTO establishes guidelines on the actions that countries should take at each alert level. But the corresponding notches on the scale do not take into account the severity of the virus, its progression, or the number and type of persons or regions infected. As a result, the alerts and the changes in the scale announced by the WTO, as well as the adoption of inadequate measures in some countries, have sparked confusion, panic, and uncertainty.

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1. According to the WTO (Pandemic Influenza preparedness and mitigation in refugee and displaced populations, Geneva 2008), an influenza pandemic occurs when a novel influenza virus appears against which the human population has limited or no immunity, and which transmits efficiently from person to person resulting in several simultaneous epidemics worldwide with the potential for considerable morbidity and mortality.
2. Credit Suisse (2009), "The Pandemic Risk: SARS Revisited" and Siu and Wong (2004), "Economic Impact of SARS: The Case of Hong Kong", HIEBS working paper 1084.
3. Kennedy, S., Thomson, J. and P. Vujanovic (2006), "A Primer on the Macroeconomic effects of an Influenza Pandemic", Australian Treasury Working Paper 2006-01.
4. IMF (2006), "The Global Economic and Financial Impact of an Avian Flu Pandemic and the Role of the IMF".

Box 11

Measures taken in Mexico to deal with the crisis

Mexican authorities have taken a series of measures that can be classified according to their goals, as follows:

Fiscal Measures

1. Economic Support Program.
Announced in March 2008, it offers tax incentives to companies and self-employed individuals, simplifications for foreign trade, a 5 percent rollback on IMSS contributions, increased budget funding for the National Employment System, more spending by Pemex, promotion of productive centers in disadvantaged zones, and reduction of electricity rates for peak hours.

2. Increase debt with multilateral financial organizations under preferential conditions.
The federal government made the decision to take out additional 5 billion dollars in debt from multilateral financial organizations.[1]

3. Program to Promote Growth and Employment (PICE).
Announced in October 2008, the plan offers a series of fiscal measures to stimulate the economy. Among these are increased public spending on infrastructure, totaling 65.1 billion pesos, and greater direct funding and through development banks.[2]

4. National agreement in favor of Household Economies and Employment (ANAFE).
This agreement was announced in January 2009 and consists primarily of increased funding for the Temporary Program for Employment , an increase in the amount of retirement savings withdrawals allowed for unemployment, a temporary extension of IMSS coverage in the event of job loss, a gasoline price freeze, a reduction on natural gas prices and electricity rates, an expansion of financing for housing, support for the competitiveness of firms and small and medium enterprises (PyMEs) through financing from development banks and development trusts, an increase in infrastructure investment primarily through Pemex, and actions to make budget spending more efficient and transparent.[2]

Measures to Promote Liquidity and Stability in the Foreign Exchange Market

1. Daily and extraordinary dollar auctions with a set minimum price.
In order increase liquidity in the foreign exchange market, the Foreign Exchange Commission determined in October 2008 to re-launch dollar sales by Banco de México in amounts of up to 400 million dollars a day, in auctions with a set minimum price two percent higher than the fix rate for the previous day. Also, under exceptional circumstances -as has been the case- extraordinary auctions may be held. [1,3]

2. Foreign currency swaps with the U.S. Federal Reserve.
In October 2008, Banco de México agreed on currency swap lines with the Federal Reserve for up to 30 billion dollars in order to supply liquidity to the foreign exchange market.[3]

3. Dollar auctions with no set minimum price.
Given the persistent lack of liquidity in the foreign-exchange market, the Foreign Exchange commission decided that for the period of March-June 2009 up to 100 million of the 400 million dollars from daily auctions would be auctioned with no set minimum price.[4]

Measures to Restart Lending

1. Refinancing support.
Nacional Financiera and Mexico's Eximbank introduced a support program for refinancing commercial paper issued by businesses and financial firms. [1,3]

2. Support for mortgage brokers.
The Federal Mortgage Company (SHF) decided to extend support and refinancing to allow non-bank home mortgage institutions to meet their closest maturing liabilities. Furthermore, to encourage the growth of the mortgage industry, it extended medium-term credit lines for bridge funding, and long-term financing for individual loans. It will also continue its support for purchases and sales of mortgage-backed securities, encouraging greater liquidity in this market.[1]

3. Credit line with the International Monetary Fund (IMF).
To support employment, open access to credit for companies and households, encourage economic stability and growth, the Foreign Exchange Commission negotiated and obtained a flexible credit line from the International Monetary Fund for close to 50 billion dollars for a one-year term.[4]

4. Credit auctions in US dollars based on foreign-currency swaps obtained from the U.S. Federal Reserve.
Through a dollar credit auction mechanism, in April 2009, Banco de México offered commercial and development banks dollars from the swaps taken out with the U.S. Federal Reserve. This measure was intended to facilitate company access to dollar financing.[4]

Measures to Stabilize the Financial System

1. New Banco de México liquidity mechanisms.
Beginning in October 2008, in addition to the previously accepted guarantees for operational facilities, Banco de México accepts new assets as collateral on liquidity loans at a rate of 1.1 times the one-day target rate determined by Banco de México's Board of Governors. Among accepted assets are Monetary Regulation Deposits and securities that were formerly not accepted, the secondary market for which was affected by the crisis. Additionally, in December of the same year new liquidity schemes were expanded to accept collateral in the form of loans from banks to federal and municipal governments whose repayment source or collateral consisted of federal funding included in branches 28 or 33 of the Federal Spending Budget for the year in question.[1]

2. Interest rate swap auctions.
In October 2008, Banco de México agreed to hold interest rate swap auctions to mitigate the impact of fluctuations in the long-term fixed-rate yield curve. In these auctions, Banco de México offered the 28-day interbank equilibrium rate as the floating rate.

3. Lower placement of medium- and long-term securities and higher placement of short-term issues.
Both the Ministry of Finance (SHCP) and the Deposit Insurance Agency (IPAB) modified their auction schemes for the fourth quarter of 2008, reducing long-term placements and replacing them with short-term placements or financing.[1,3]

4. Repurchase of IPAB bonds by Banco de México.
To improve market liquidity, Banco de México introduced an auction mechanism to acquire 150 billion pesos in IPAB bonds.[1,3]

5. Repurchases of Udibonos and Bonos M.
In order to increase liquidity in the markets, in October 2008, the federal government announced a program to buy back Udibonos and Bonos M through Banco de México.[3]

6. Facilitate restructuring of mutual funds' portfolios.
The CNBV issued a new rule allowing the purchase and sale of government securities between mutual funds and financial firms belonging to the same financial group during a six-month period beginning in October 30, 2008. The purpose of this measure is to facilitate the restructuring of mutual funds' portfolios.[1,3]

7. Support for mortgage Sofoles and Sofomes.
The SHF extended a 65 percent guarantee on the debt issues of mortgage Sofol Patrimonio and mortgage Sofomes Su Casita, Fincasa, Casa Mexicana, Vértice and Crédito Inmobiliaria, as a consequence of being in a sound financial condition and managed responsibly and transparently.

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1. For more information, see Box 4 of the July-September 2008 Inflation Report published by Banco de México.
2. For more information, see Box 8 of the October-December 2008 Inflation Report published by Banco de México.
3. For more information, see section 3.3.2.2 of the October-December 2008 Inflation Report published by Banco de México.
4. For more information, see section 3.2.2.2 of the January-March 2009 Inflation Report published by Banco de México.

Against this backdrop, Banco de México and the Federal Government have implemented diverse measures with a view to dissipating the above-referred uncertainty and providing the foreign exchange market with liquidity. The main actions adopted include: i) different measures implemented by the Foreign Exchange Commission to supply the foreign exchange market with liquidity and guarantee that a significant portion of 2009 projected reserves are sold in the market;[18] ii) the April 17th 2009 approval by the International Monetary Fund of a "Flexible Credit Line" (FCL) for Mexico amounting to 31.528 billion in Special Drawing Rights (around 47 billion dollars) over a one-year period with the possibility of renewal[19]; and iii) the central bank's April 21st 2009 dollar loan auction between commercial banks and development banks using the funds from the first drawdown on the temporary mechanism for foreign currency exchange (called a "swap line") set up with the United States Federal Reserve.[20]

[18] See the Foreign Exchange Commission's October 2008, February 2009 and March 5th and 29th 2009 press releases.

[19] Access to this credit line is precautionary; it underscores certainty and confidence in the Mexican economy by ensuring that external accounts can be financed, even in the event of a greater deterioration in international financial markets. It should be highlighted that this credit line does not impose conditions on Mexico in terms of economic policy. See the Foreign Exchange Commission's April 1st and April 17th, 2009 press releases.

[20] This line was announced on October 29th 2008 and is good until October 30th 2009 (see Banco de México's October 29th, 2008 and February 3rd, 2009 press releases). 3.221 billion dollars of this auction amounting to 4 billion dollars was assigned.

3. Financial Position of Households, Firms and the Public Sector

This section examines the balances of the private, public and external sectors and outlines their structure. It also does an in-depth analysis of the financial position for households, non-financial private firms and the public sector, describing recent trends in savings, indebtedness and debt service in these sectors.

The year 2008 was characterized by less accessible financial markets and, for the last quarter, by a strengthening and widening financial crisis as well as by a sharp slowdown of the world economy. Emerging markets, in particular, have seen their ability to obtain financing in international markets severely curtailed. Furthermore, high risk aversion among investors and the global de-leveraging process led to asset sell-offs in financial markets. These two processes affected foreign exchange markets as well as other financial markets, especially in emerging economies, restricting financing in domestic debt markets and tightening bank credit flows.

In this context the financial conditions faced by the above-referred sectors, particularly in the fourth quarter of 2008, led to changes in their balances, greater financial restrictions and higher costs.

3.1. Sources and uses of funds in the economy

The financial balances of the public, private and external sectors are useful for assessing the risks associated with financial flows within an economy. Generally speaking, the sum of the public and private sector balances is equal to the external sector balance. That is why these balances reflect the result of financial restrictions on sectors, and allow the identification of both the change in the net creditor or debtor positions of each sector, as well as the origin and destination of financial resources.

In recent years, the public sector balance measured by the Public Sector Borrowing Requirements, PSBR, (Requerimientos Financieros del Sector Público, RFSP), has shown a deficit which has been financed with private sector savings as well as with external savings (current account deficit) (Table 3).[1] However, in 2004-2007 there was a big reduction in the public sector deficit, from 1.6 percent to 0.9 percent of GDP. This meant that, despite reductions in private sector net savings, up until 2006 the economy needed less external savings. During 2008, the public sector position implied financial needs equivalent to 1.8% of GDP (excluding the fiscal cost of the ISSSTE Reform Act (Reforma a la Ley del ISSSTE)). Although the private sector's creditor position increased slightly to 0.3 percent of GDP, most of the Public Sector Borrowing Requirement deficit was

[1] Public Sector Borrowing Requirements measure total public sector financial resource needs (both domestic and external) in the broadest sense. This concept integrates the financial operations of: a) the economic public sector (Federal Government and Public Agencies and Companies); b) the financial intermediation of development banks and development trust funds; and c) additional liabilities (IPAB, Pidiregas, FARAC, the contingency associated with the subsidy implied in the interest rate swap of the bank loan restructuring scheme in UDIs and bank debtor support programs). The measurement of PSBR used here is based on the sources of funds methodology (see 3.5 of this chapter).

financed in net terms through higher external savings (a current account deficit of 1.5 percent of GDP).

Table 3
Flow of Funds by Type of Sector[1/]
Flows as a percentage of GDP

	2004	2005	2006	2007	2008
Private sector's balance [2/]	**-0.9**	**-1.0**	**-0.4**	**0.0**	**-0.3**
Domestic	-1.7	-2.2	-1.7	-1.6	-3.4
Financial instruments	-3.5	-5.4	-6.4	-2.9	-5.0
Financing	1.1	1.7	2.1	2.8	1.3
Other financial system items	0.6	1.5	2.6	-1.4	0.3
External	0.8	1.2	1.3	1.6	3.1
Foreign direct investment	3.1	2.6	2.0	2.6	2.0
Net foreign financing	-1.8	-0.9	-1.3	-0.8	1.3
Errors and omissions (Balance of payments)	-0.5	-0.4	0.6	-0.2	-0.2
Public sector's balance [3/]	**1.6**	**1.5**	**0.8**	**0.9**	**1.8**
Domestic	1.2	1.3	2.6	1.5	1.7
External	0.5	0.2	-1.8	-0.7	0.1
External Sector's Balance (Current Account) [4/]	**-0.7**	**-0.5**	**-0.5**	**-0.8**	**-1.5**

Figures as of December, 2008.
Source: Banco de México.
1/ Given as a percentage of annual average nominal GDP. It excludes banking system balance operations. A positive sign denotes a deficit while a negative sign denotes a surplus. The effect of variations in Mexican peso exchange rates is eliminated. Preliminary figures. Figures may not add up due to rounding.
2/ The private sector includes firms, households and non-bank financial intermediaries.
3/ The public sector is measured as Public Sector Borrowing Requirements (*Requerimientos Financieros del Sector Público*, RFSP) by Banco de México using the sources of financing methodology, including non-recurrent revenues. Excludes the fiscal cost of the Social Security Reform Act, (Reforma a la Ley del ISSSTE).
4/ Drawn from the current account balance of payments. A negative figure means foreign financing for the domestic economy (external sector surplus), which equals Mexico's current account deficit.

The 2008 increase in the PSBR deficit was mainly due to indebtedness from Long-Term Productive Infrastructure Projects (Pidiregas) and greater financial intermediation for development banks.[2] Regarding the latter, in the fourth quarter of the year, within a context of greater credit restrictions and financing problems faced by several companies, development banks increased credit granting, partially offsetting the decrease in credit granted by commercial banks. As Section 3.5 states, for 2009 and 2010 the public sector is expected to register higher PSBR deficit levels compared to 2008 due to fiscal stimulus programs aimed at boosting domestic demand, and a possible deterioration of the government revenue.

Regarding external savings, in the first two months of 2009, the deterioration of the outlook for external revenue and tight conditions in capital markets gave rise to uncertainty about the amount of funds available to finance the current account deficit. In order to dissipate this uncertainty, in March 2009, the Foreign Exchange Commission published a study of the expected behavior of

[2] It should be noted that the traditional public sector balance (economic deficit) was close to zero (0.1 percent of GDP).

this year's balance of payments, which concludes that Mexico will not have any problems to finance the estimated current account deficit.[3]

Subsequently in May 2009, the Foreign Exchange Commission presented a revision of the expected behavior of the balance of payments confirming that Mexico would have no difficulty in financing the current account deficit for 2009.[4] In particular, due to a bigger-than-expected slowdown in economic activity the trade balance deficit should become smaller. Although a reduction in the capital account surplus is expected, it should be less than the reduction in the current account. In addition less restrictive conditions for credit granting as well as a less volatile exchange rate are expected due to an improvement in financial conditions of international markets as well as measures taken by Mexico to restore the orderly functioning of financial markets.

It should be noted that a greater use of funds by the public sector and a lower current account deficit generate the need for an increase of the private sector surplus. As a result, financing for this sector could be limited compared to the recent past.

3.2. The structure of sources and uses of funds

During 2008, the financial sources in the economy experienced a major change of trend, especially in the last quarter of the year. During the first three quarters of 2008, growth in the domestic financial sources was modest. However, in the last quarter, and more so in December, growth in these sources rebounded due to the effect of the ISSSTE Reform Act (Reforma a la Ley del ISSSTE) on private sector financial assets as well as a temporary increase in voluntary financial savings from residents; this last one encouraged, among other things, by a restructuring of the private sector portfolio in favor of assets with a safer nominal return.[5] In contrast, and responding to greater global risk aversion, as of the last quarter of 2008 there was a reduction in holdings of financial assets by non-residents.[6] During 2008, the monetary aggregate M4 recorded an average real annual growth of 7.3 percent, similar to the previous year.[7] It should be pointed out that in the last quarter of 2008, exchange rate depreciation had an impact on the peso valuation of external sources of funds.

Between January and May 2009, the monetary aggregate M4 recorded an average real annual growth of 8.5 percent, reflecting the effect, on an annual basis, of the change in the pension fund regime of the State Worker Social

[3] See the Foreign Exchange Commission's March 5th, 2009 press release. With regards to other measures adopted by Banco de México and the Federal Government to preserve the sound functioning of foreign markets in Mexico, see Table 11.

[4] See the Foreign Exchange Commission's May 29th, 2009 press release.

[5] The ISSSTE Reform Act (Reforma a la Ley del ISSSTE) affected wide monetary aggregates through two channels. First, the Federal Government made deposits to its account with Banco de México for workers who opted for the new ISSSTE pension scheme. The funds are managed by Pension Fund Managers (Afores), in this case mainly the PENSIONISSSTE Afore. Second, an ISSSTE Pension Bond was issued, which represents a liability for the Federal Government and an asset for ISSSTE workers. The new ISSSTE pension scheme implied recognizing a Federal Government labor liability whose counterpart is a financial asset belonging to the workers which opted into the new individual accounts scheme.

[6] While in September savings by non-residents in domestic financial instruments amounted to 399.3 billion pesos, in the last quarter of the year they decreased by 42.2 billion pesos.

[7] The monetary aggregate M4 includes the holding by the resident and non-resident private sector of bills and coins in public hands, the holding of domestic financial assets, as well as the deposits in Mexican bank branches and agencies abroad.

Security and Services Institute (Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado, ISSSTE). However, its recent development has been characterized by a slower rate of growth due to the effect of the economic slowdown on voluntary savings.

The exposure of fund sources in the economy to movements in the exchange rate has decreased in recent years. On September 2008, foreign currency denominated fund sources, made up of external financing and some foreign currency denominated M4 assets (3.6 per cent of M4) accounted for 24 percent of the total while at the end of 2004 they accounted for 34 percent of the total (26.8 percent in December, 2008).[8] This was largely due to the reduction in the public sector's external debt.

For 2008, fund sources in the economy accounted for 72.6 percent of GDP, 6.7 percentage points more than the previous year level (Table 4).[9,10] The monetary aggregate M4 was equivalent to 55.2 percent of the 2008 GDP, 4.3 percent more (in 2008 GDP terms) than the year before.[11] The impact of the ISSSTE Reform Act (Reforma a la Ley del ISSSTE) on the monetary aggregate M4 implied an increase of 1.9 percentage points of GDP in the holding of financial assets by the private sector. Meanwhile, the depreciation of the peso in the fourth quarter of the year was the main reason for the increase in the external financing balance which increased, as a share of GDP, from 13.6 percent in the third quarter of 2008 to 17.3 percent in the final quarter of the year. The effective revalued flow of external financing was virtually nil, in line with the more restrictive conditions in international financial markets. [12]

[8] In order to isolate the effect of peso depreciation in the fourth quarter of 2008 comparisons with September 2008 are made.

[9] The fund sources exclude foreign direct investment and stock market.

[10] In the national accounts methodology, total savings is considered a flow item equal to gross fixed capital formation in construction, machinery and equipment plus variations in inventories. On the other hand, the economy's financial savings refer to the stock of domestic financial assets. These resources are intermediated by the financial system and can be used to finance the private sector (consumption and investment expenditure), the public sector or the external sector (current account surplus).

[11] Despite the increase of the monetary aggregate M4 with respect to GDP, its share in the fund sources for the economy decreased from 77.3 percent in 2007 to 76.1 percent in 2008.

[12] The effective revalued flow excludes the effect of movements in the exchange rate.

Table 4
Sources and Uses of the Economy's Financial Resources
Stocks as a percentage of GDP

	2004	2005	2006	2007	2008	Structure % 2008
Total sources	**66.2**	**66.8**	**65.9**	**65.9**	**72.6**	**100.0**
M4	45.6	48.9	49.8	50.9	55.2	76.1
Held by residents	44.4	47.3	48.0	48.3	52.4	72.2
Held by non-residents	1.2	1.6	1.8	2.6	2.9	3.9
External financing	20.7	17.8	16.1	15.0	17.3	23.9
Total uses	**66.2**	**66.8**	**65.9**	**65.9**	**72.6**	**100.0**
Public sector[1/]	36.8	35.2	32.4	31.4	35.8	49.3
States and municipalities	1.5	1.4	1.3	1.3	1.4	2.0
Private sector	24.8	25.2	26.9	28.6	30.7	42.2
Households	10.3	11.3	12.2	12.8	12.4	17.1
Consumer	2.5	3.5	4.1	4.7	4.4	6.0
Housing[2/]	7.8	7.9	8.0	8.1	8.0	11.1
Companies	14.5	13.9	14.8	15.8	18.2	25.1
Credit from financial intermediaries[3/]	6.2	5.9	6.4	7.6	8.4	11.6
Securities issued	1.9	1.8	1.7	1.7	1.8	2.5
External	6.4	6.1	6.7	6.6	8.0	11.0
International Reserves[4/]	8.0	7.9	7.0	7.6	9.8	13.4
Other Items[5/]	-4.9	-2.9	-1.8	-3.1	-5.0	-6.9

Figures as of December, 2008.
Source: Banco de México.
Figures may not add up due to rounding. Stocks as at December of each year expressed as a percentage of annual average nominal GDP of the corresponding year.
1/ Refers to the Historical Stock of Public Sector Borrowing Requirements (PSBR) reported by the Ministry of Finance. During 2008, PSBR as a percentage of GDP for the last quarter of that year was 34.5 percent.
2/ Total portfolio of financial intermediaries and of the Public Housing Fund (Infonavit) including restructuring programs.
3/ Total portfolio of financial intermediaries including restructuring programs.
4/ As defined by the law governing Banco de México.
5/ A positive (negative) stock in this item constitutes a net use (source) of financial resources. Therefore, a negative stock in this category means that the sources of funds not considered in M4 and foreign financing (including capital accounts, results and reserves and other liabilities of Banco de México, commercial banks and development banks, financial intermediaries and Infonavit) more than offset the uses not considered in the financing of the public sector, states and municipalities, non-financial private companies and financing for international reserve accumulation (including non-sectorized assets and other assets of Banco de México, commercial banks and development banks, Regarding the use of financial resources in the economy, the structure of financial liabilities underwent a change, particularly in the fourth quarter of 2008. The public sector used relatively more financial resources while the share of private sector financing has diminished as a share of the total.

During 2008, the Historical Stock of Public Sector Borrowing Requirements (HSPSBR) rose, mostly due to the effect of the ISSSTE Reform Act (Reforma a la Ley del ISSSTE) on the Federal Government's domestic debt and the impact of peso depreciation on the peso value of foreign debt. Thus in December 2008, the HSPSBR was equivalent to 35.8 percent of GDP, 4.3 percentage points above the previous year level (Table 4). The effect of obligations contracted by the Federal Government due to the ISSSTE Reform Act (Reforma a la Ley del ISSSTE) on the HSPSBR was equivalent to 2.2 percent of GDP.

The coming into force of the ISSSTE Reform Act, which consists of the creation of an individual capitalization pensions system, implied the Federal Government's previous recognition of the labor liability accrued from active government workers, as well as a greater indebtedness arising from the Act's transition costs. In December 2008, this reform had a one-time impact on public debt and on the holding of financial assets by residents. However, this change in the pension scheme will lessen future pressures on public spending on pensions. Likewise, this new defined-contributions scheme is a public policy measure which may gradually increase the economy's financial savings.

The exposure of public sector net debt to movements in the exchange rate has decreased in recent years due to the implementation of a public debt policy which has favored a structure in which peso-denominated debt has a bigger share. Between the end of 2004 and 2008, the share of external financing of total debt came down to 25.6 percent from 37.3 percent. As a result, in December 2008 the external debt balance represented 9.2 percent of GDP.

During 2008, there was a slowdown in the growth of funds channeled to private sector financing, especially those for households. While at the end of 2008 total non-financial private sector financing accounted for 30.7 percent of GDP (2 percentage points above that observed for 2007), household financing decreased by 0.4 percentage points of GDP. Meanwhile, the increase of 2.4 percentage points of GDP in the financing of firms is partly due to the effect of the depreciation on companies' foreign currency denominated debt (see section 1.4.). It should be noted that the non-financial private sector's share of the economy's financing decreased from 43.5 percent in 2007 to 42.2 percent in 2008 (Table 4). Finally, at the end of December 2008, international reserves amounted to 85.441 billion dollars (9.8 percent of GDP), an increase of 7.450 billion dollars relative to the end of 2007. As of June 30th, 2009, international reserves stood at 74.181 billion dollars.

3.3. Households

Households' financial savings

Household savings in financial instruments (household M2) are the main source of the economy's domestic financial resources.[13] In the first quarter of 2009, household financial savings accounted for 72 percent of financial savings in domestic instruments (M2) by residents and 38.1 percent of GDP (Table 5).

During 2008, the average real annual growth rate in household financial savings decreased from 7.7 percent in 2007 to 3.9 percent (Graph 18a).[14] This slowdown in average growth was observed in both voluntary and compulsory savings.[15] As of December 2008 average real annual growth in this aggregate rebounded, due partly to the impact of the coming into force of the ISSSTE pension reform (Graph 18a).[16]

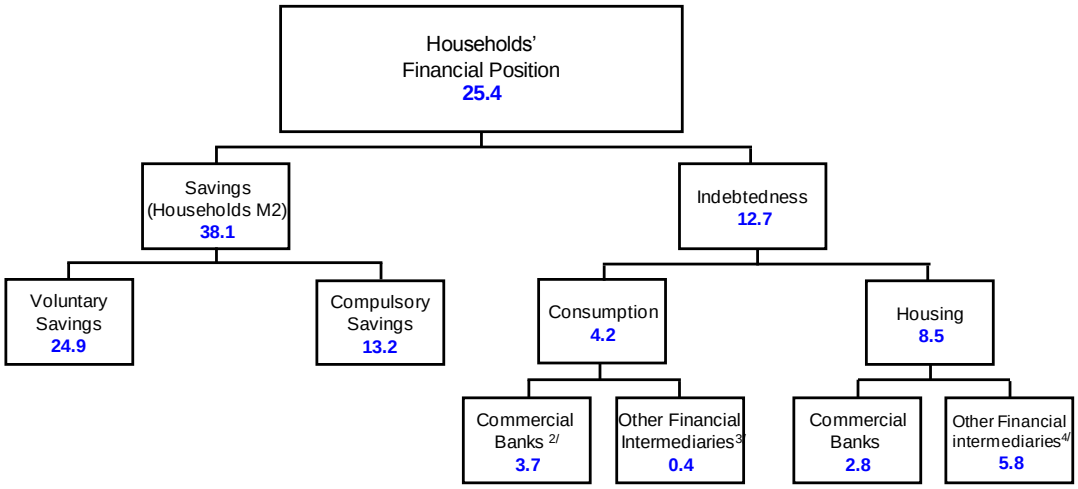
[13] Household financial savings are defined as household ownership of domestic financial instruments considered in the monetary aggregate M2.

[14] Excluding the impact of the ISSSTE Reform Act (Reforma a la Ley del ISSSTE), in 2008 household M2 grew at an average real annual rate of 3.4 percent.

[15] Voluntary savings is the difference between total financial savings and compulsory savings. Compulsory savings includes resources from the Pension Savings System (*Sistema de Ahorro para el Retiro*, SAR), Infonavit and pension funds of the State Worker Social Security and Services Institute (*Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado*, ISSSTE).

[16] Excluding the impact of the ISSSTE Reform Act (Reforma a la Ley del ISSSTE), between December 2008 and May 2009, household M2 showed an average real annual variation of 5.4 percent.

Table 5
Households' Financial Position: Stocks as of the First Quarter of 2009
Percentage of GDP [1/]



Source: Banco de México.
1/ Figures may not add up due to rounding. Figures correspond to the balance as at the first quarter of 2009 given as a percentage of annual average nominal GDP.
2/ Includes Sofomes E.R. that are commercial bank subsidiaries.
3/ Includes loans granted by development banks, limited-purpose non-bank banks (Sofoles), Regulated Multiple Purpose Financial Institutions (Sofomes E.R.), financial group subsidiaries and Savings and Loans Associations (SAPs).
4/ Includes loans granted by development banks, Sofoles, Sofomes E.R. and the Public Housing Fund (Infonavit).

Since the fourth quarter of 2008, there has been a sharp decrease in household financial savings deposited with institutional investors (Graph 18b),[17] due, among other factors, to the restructuring of the household savings portfolio in favor of financial assets with a safer nominal return. This mainly affected financial savings channeled to mutual funds (Graph 18c). Part of this went to bank deposits, which during the same reference period registered an average real annual variation of 9.2 percent (Graph 18b).

Household indebtedness

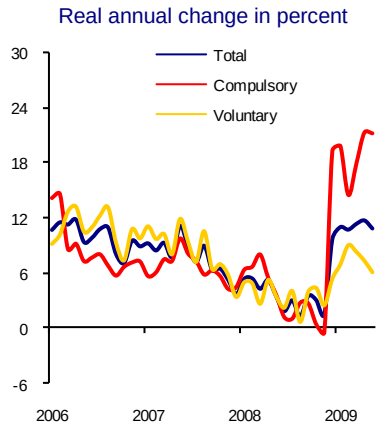
During 2008 and the first quarter of 2009, there was a slump in growth for household credit. On the one hand, the more restrictive conditions prevailing in the financial system and the perception of the sector's increased credit risk due to higher delinquency rates have translated into tighter credit granting conditions. On the other hand, the reduction in the wage bill and the deterioration in consumer confidence have negatively affected household demand for credit. In this context, growth in total household credit displayed a downward trend, recording a real annual contraction of 3.5 percent as of the first quarter of 2009 (vs. 10.6 percent growth in March 2008).[18] Thus, at the end of the first quarter of 2009, household credit totaled 12.7 percent in terms of GDP (Table 5).

[17] Institutional investors are insurance companies, mutual funds and Investment Funds Specialized in Retirement Savings (Sociedades de Inversión Especializadas de Fondos para el Retiro, SIEFORES).

[18] Information on total household financing is published on a quarterly basis and corresponds to information available as of the first quarter of 2009. This financing comprises credit granted by banks, non-bank financial intermediaries and Infonavit. Information on bank financing to households is published on a monthly basis and corresponds to information available as of May.

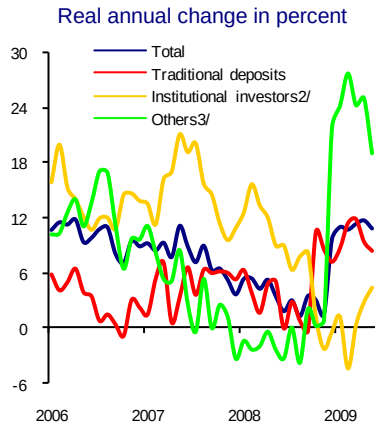
Graph 18
Household Savings in Domestic Financial Instruments

a) Total Voluntary and Compulsory Financial Savings[1/]



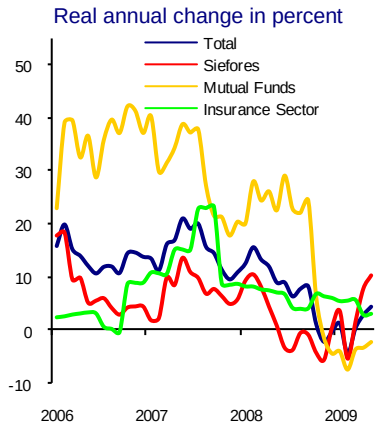
Figures as of May, 2009.
Source: Banco de México.

b) Total Financial Savings By Intermediary



Figures as of May, 2009.
Source: Banco de México.

c) Financial Savings with Institutional Investors



Figures as of May, 2009.
Source: Banco de México.

1/ Voluntary saving is the difference between total financial savings and compulsory savings. The latter include the Public Housing Fund (Infonavit and Fovissste), the central account of Banco de México (IMSS and ISSSTE), Siefore portfolio funds and pension funds of the Government Employees' Social Security Institute ISSSTE).
2/ Includes securities held by Specialized Retirement Fund Investment Firms (Siefores) insurance companies and mutual funds with the exception of mutual funds for corporations.
3/ Includes notes and coins held by the public, securities investments on their own account, public housing funds (Infonavit and Fovissste), the central account of Banco de México (IMSS and ISSSTE) including Siefore portfolio funds and ISSSTE pension funds.

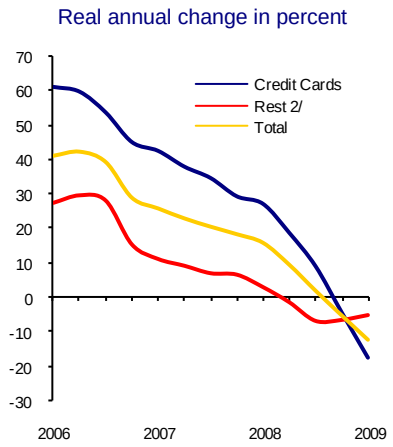
Meanwhile, total consumer credit growth continued to display a clear downward trend. As of the first quarter of 2009 it had decreased by 12.5 percent in real annual terms and it equaled 4.2 percent of GDP (Graph 19a).[19] Most of the consumer credit is granted through bank credit cards (56 percent as of the first quarter of 2009). It should be noted that the number of performing credit cards has decreased in recent months, and after reaching its historical maximum in June 2008, there have been credit card net cancellations (Graph 19b).[20] The use of credit cards has also slowed down, declining 9.8 percent year-on-year in March 2009 (Graph 19c).

[19] Includes total consumer credit portfolio of the banking sector (which includes direct credit and portfolio associated with restructuring programs) and total consumer credit of non-bank financial intermediaries.

[20] Performing credit cards those banks offer clients have been activated by them. They include main and additional cardholders. This indicator is available as of March 2002.

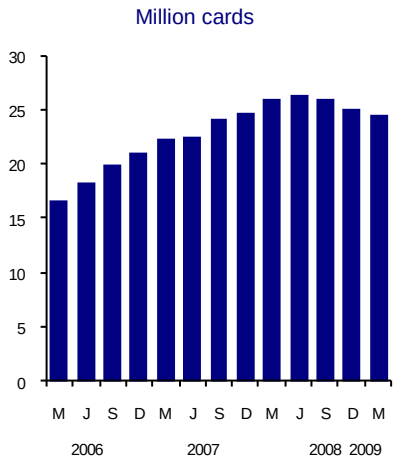
Graph 19
Consumer Credit

a) Consumer credit [1/]



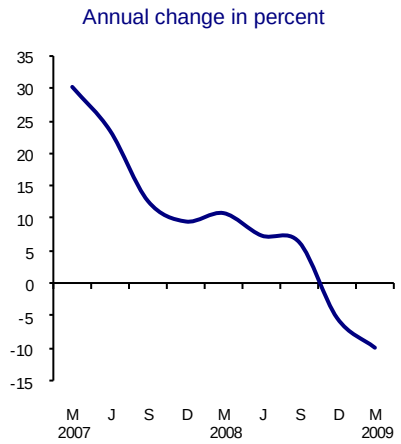
Figures as of March, 2009.
Source: Banco de México.

b) Performing Credit Cards [3/]



Figures as of March, 2009.
Source: Banco de México.

c) Number of Credit Cards Used in the Quarter [4/]



Figures as of March, 2009.
Source: Banco de México.

1/ Includes the banking sector's direct credit portfolio, the portfolio related to banking sector restructuring programs and the total credit of non-bank financial intermediaries.
2/ Includes credit for the acquisition of consumer durables and other consumer loans by both the banking sector and other financial intermediaries.
3/ Performing credit cards are those banks make available to clients and which have been activated by them. They include owned and additional cards.
4/ Refers to credit cards used in the quarter.

The commercial banking sector is the main financial intermediary in granting consumer credit. As of the first quarter of 2009, its total consumer credit portfolio accounted for 89.5 percent of the consumer credit market. In May, 2009, commercial banks' performing direct consumer credit registered a real annual contraction of 20.4 percent compared to a real annual growth of 10.9 percent in the same period for 2008.[21]

In the last year, growth in total mortgage loans also slowed down and at the end of the first quarter of 2009 registered real annual growth of 1.7 percent, equaling 8.5 percent of GDP (Graph 20a and Table 5). Over the last three years, the number of mortgage loans has remained stable. During 2008, a total of 716.9 thousand mortgage loans were granted, an amount similar to the previous year (Graph 20b).[22] Infonavit granted, for this same year, a larger number of mortgage loans than in 2007: 488.6 thousand compared to 456 thousand in 2007.

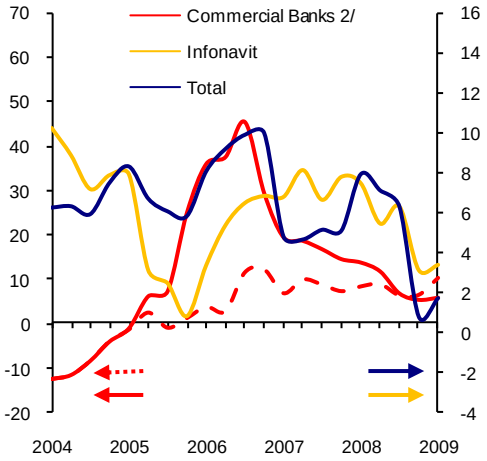
[21] As of March 2008, this data includes the consumer loan portfolio balance of Sofomes E.R, commercial bank subsidiaries.

[22] Source: National Housing Commission.

Graph 20
Mortgage loans

a) Mortgage loans[1/]

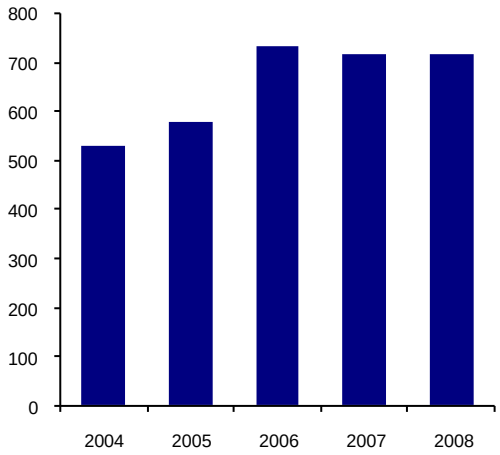
Real annual change in percent



Figures as of March, 2009.
Source: Banco de México.

b) Home acquisition loans

Thousand



Figures as of December, 2008.
Source: National Housing Commission.

1/ Includes the banking sector's direct credit portfolio, the portfolio related to banking sector restructuring programs and the total credit of non-bank financial intermediaries and the Public Housing Fund (Infonavit).
2/ The dotted line excludes the acquisition by commercial banks of mortgage non-bank banks' (Sofoles) credit portfolios.

Commercial banks have increased their share of the mortgage loan market up to, at the first quarter of 2009, 32.4 percent of the total (31.1 percent in March, 2008).[23] In May 2009, commercial banks' performing direct mortgage credit grew by 5.1 percent, in real terms, relative to the previous year. This figure is to be compared to the 18.1 percent real growth, year-on-year, from May 2008.[24]

Households' non-performing loans

To complement the financial position of households, the share of non-performing loans must be discussed. The delinquency rate , which is defined as non-performing loans as a percentage of the total loan portfolio, does not reflect the degree of deterioration in borrower payment because it is distorted by banking sector decisions regarding loan write-offs. Therefore a better indicator is the adjusted delinquency rate, which strips out the effect of such write-offs over the previous twelve months.[25] Adjusted delinquency rates for commercial bank credit to households continue to show an upward trend, particularly in the case of consumer credit. The rise in these rates could be related to diverse factors that have negatively impacted the payment capacity of households. On one hand, the economic slowdown, unemployment and reduction in workers' remittances had an

[23] Includes commercial banks' total mortgage portfolio, performing and non-performing (which includes direct credit and the credit portfolio related to restructuring programs).

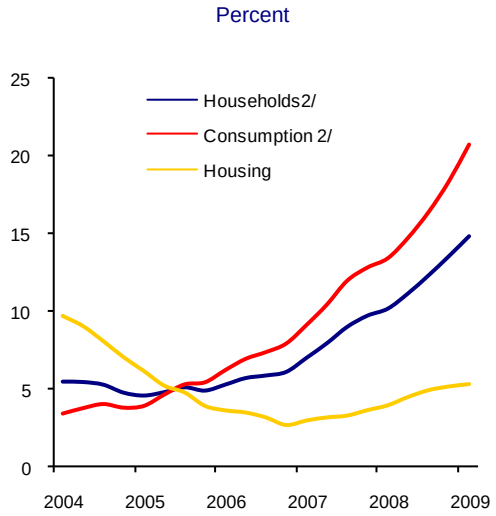
[24] Commercial bank mortgage loan charts include the acquisition of credit portfolios from mortgage-dedicated Limited Purpose Financial Institutions (Sofoles). Also, in accordance with National Banking and Securities Commisson (CNBV) provisions, as of January 2007 these charts include reclassifications of mortgage portfolio bridge loans as corporate loans.

[25] The adjusted delinquency rate is defined as the sum of non-performing direct loans plus any write-offs or losses recognized by banks during the twelve previous months divided by the total direct loan portfolio plus write-offs or losses (See the 2007 Financial System Report, page 51 and Box 21 as well as the July-September 2008 Inflation Report).

adverse effect on households' income. On the other hand, a higher risk premium increased interest rates for these products (see Section 7.1). Furthermore, as mentioned in last year's Report, an additional factor is the deterioration in portfolios containing loans which for several years were granted to high-risk sectors of the population with no previous credit history. The adjusted delinquency rate for commercial banks' credit to households rose from 10.2 percent in March 2008 to 14.9 percent in March 2009. Regarding the components of households' credit, between March 2008 and March 2009, the adjusted delinquency rate on commercial banks' consumer credit increased from 13.4 percent to 20.7 percent. The adjusted delinquency rate of commercial banks' mortgage credit rose during the comparison period from 1.4 percent to 5.3 percent in March 2009 (Graph 21a).

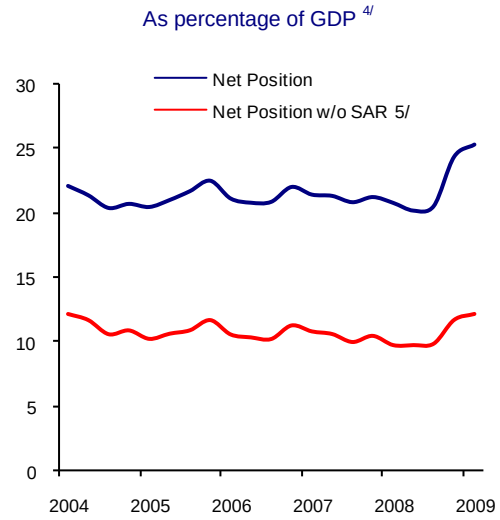
Graph 21
Adjusted Delinquency Rate and Net Financial Position of Households

a) Adjusted Delinquency Rate on Household Loans[2/]



Figures as of March, 2009.
Source: Banco de México.

b) Net Financial Position of Households [3/]



Figures as of March, 2009.
Source: Banco de México.

1/ The adjusted delinquency rate is defined as the sum of direct non-performing loans plus any write-offs or losses recognized by banks during the twelve previous months dividend by the total credit portfolio plus the above-mentioned write-offs or losses.
2/ Figures as of March 2008 include the consumer loan portfolios of Sofomes E.R., commercial bank subsidiaries.
3/ Assets minus financial liabilities excluding share holdings.
4/ Refers to average nominal GDP for the last four quarters.
5/ SAR comprises public housing funds (Infonavit and Fovissste) and retirement funds (IMSS and ISSSTE) in Banco de México's central account, Siefores or pension funds which come under ISSSTE.

Households' financial position

During 2008, the difference between assets and financial liabilities remained stable relative to 2007. Consequently, the financial position of households registered an average surplus equivalent to 21.5 percent of GDP, similar to the 2007 average of 21.3 percent (Graph 21b).[26]

However, as of the fourth quarter of 2008, due to the impact of the ISSSTE Reform Act (Reforma a la Ley del ISSSTE) on the level of financial savings, among other things, the surplus in the financial position of households significantly increased.[27] Thus, as of the first quarter of 2009 this surplus equaled 25.4 percentage points of GDP (Table 5), thus greater than the previous year (20.8 percent of GDP). This change in the financial position of households stemmed from an increase in financial savings (4.2 percentage points of GDP) as well as from a reduction in financial liabilities (0.3 percentage points of GDP). If one excludes the compulsory savings, which are not a free resource for the sector, the financial position of households represented 12.2 percent of GDP in the first quarter of 2009, thus greater than the year before level (9.7 percent of GDP) (Graph 21b).

3.4. Non-financial private companies

The structure of financial liabilities of non-financial private companies

During 2008, the trend in financing to non-financial private companies was influenced by conditions in the international financial markets and their effect on domestic debt and bank credit markets. Companies residing in Mexico found it hard and/or difficult to acquire financing from international markets. This restriction on external financing, which took place especially during the first three quarters of 2008, was partially offset by a strong growth in domestic financing through debt issues and growth in the bank credit for firms. However, as of the end of September 2008, domestic market conditions took a turn for the worse: liquidity shrank, financial costs rose and maturities for new debt placement became shorter. Furthermore, growth in bank credit for firms also dropped.

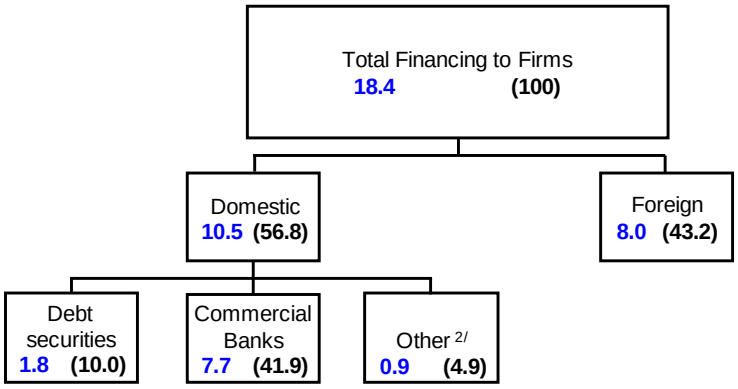
As of the first quarter of 2009, total financing to firms registered a real annual growth of 16.5 percent, equaling 18.4 percent of GDP (Table 6 and Graph 22a).[28] Domestic financing constitutes the main source of funds for non-financial private companies (56.8 percent of total financing to firms). As of the first quarter of 2009, domestic financing recorded a real annual growth of 10.3 percent (Graph 22b). During the same period, external financing to this sector equaled 8 percentage points of GDP (Table 6).

[26] This measure includes only the financial assets of households. It excludes share holdings, which represent only a portion of total household wealth.

[27] In the fourth quarter of 2008, the financial position of households amounted to 24.4 percent of GDP, an increase of 3.8 percentage points on the previous quarter.

[28] Information regarding total financing to non-financial private companies is published on a quarterly basis and is available as of the first quarter of 2009. Domestic financing to this sector comprises bank credit and non-bank financial intermediary credit as well as private debt issues. External financing includes direct indebtedness (foreign commercial bank , and other, credits) and financing through private debt issuances abroad. Information pertaining to bank credit is published on a monthly basis and is available as of May; while information on private debt issuances is available as of June.

Table 6
Total Financing to Non Financial Private Companies: Balances as of the First Quarter of 2009
Percentage of GDP (Percentage Structure) [1/]

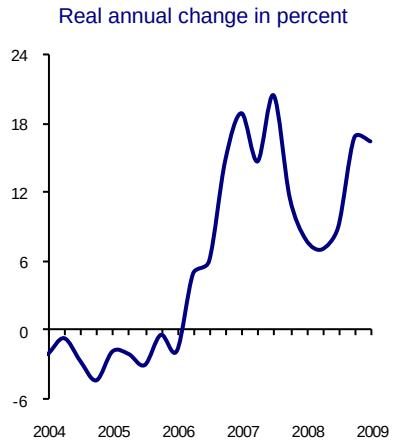


Figures as of the first quarter of 2009.
Source: Banco de México.
1/ Figures may not add up due to rounding. Numbers in blue correspond to the balance as at the first quarter of 2009 expressed as a percentage of average annual nominal GDP. Numbers in brackets and in black correspond to each category's percentage share of total financing to non-financial private firms as at the first quarter of 2009.
2/ Includes credit granted by leasing companies, factoring companies, credit unions, SAPs, Sofoles and Sofomes E.R.

A large percentage of the liabilities from non-financial private firms is foreign currency denominated. As of the first quarter of 2009, financing to non-financial private firms denominated in foreign currency amounted to 51.6 percent of the total financing. External financing to firms accounted for 43.2 percent of the total while foreign currency-denominated domestic credit accounted for 8.4 percent. This is why exchange rate volatility episodes, such as the one during the fourth quarter of 2008, have had an impact on the peso valuation of this sector's debt. With regard to domestic financing, in 2008 the number of delinquent companies in the credit bureau rose from 916,000 in December 2007 to just over one million at the end of 2008 (Graph 22c).

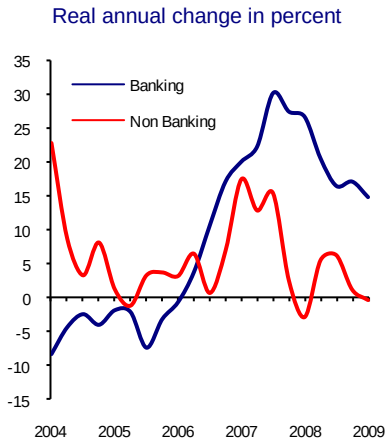
Graph 22
Financing to Non-Financial Private Firms

a) Total Financing To Firms



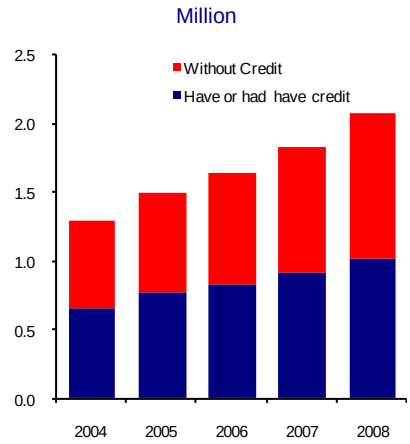
Figures as of March, 2009.
Source: Banco de México.

b) Domestic Financing to Firms by Type of Intermediary[1/]



Figures as of March, 2009.
Source: Banco de México.

c) Number of Firms in the Credit Bureau



Figures as of December, 2008.
Source: Banco de México.

1/ Non-bank financing includes total credit of non-bank financial intermediaries, debt instrument issuance, and external financing. Bank financing includes total credit portfolio and portfolio associated with restructuring programs.

Evolution of external financing to firms

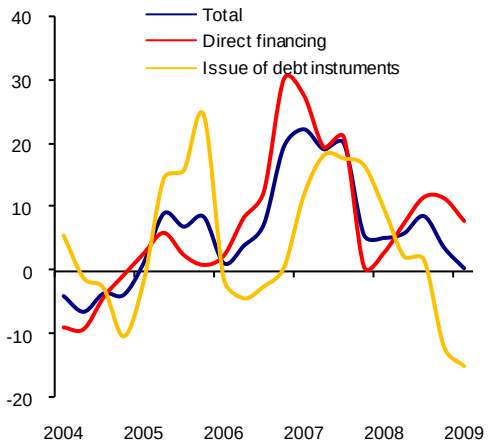
Conditions prevailing in international financial markets implied a slowdown in external financing to Mexican companies, especially financing through debt issuance. As of the first quarter of 2009 the balance of external financing expressed in dollars registered a year-on-year growth of 0.3 percent. Direct financing, comprising credit granted by foreign commercial banks, foreign suppliers, and other creditors, recorded a year-on-year growth of 7.9 percent. Financing through debt issuance in international markets decreased by 15 percent, year-on-year (Graph 23a).

Regarding the cost of financing for domestic non-financial private companies in international debt markets, the spread between the corporate-financing rate and the risk-free rate (5-year US Treasuries) widened, especially after October 2008. However, since April 2009, this spread has narrowed, following an improvement in international financial market conditions (Graph 23b).

Graph 23
External Financing to Non-Financial Private Resident Firms and the Spread on International Corporate Debt Yields

a) Financing to Non-Financial Private Resident Firms in International Markets

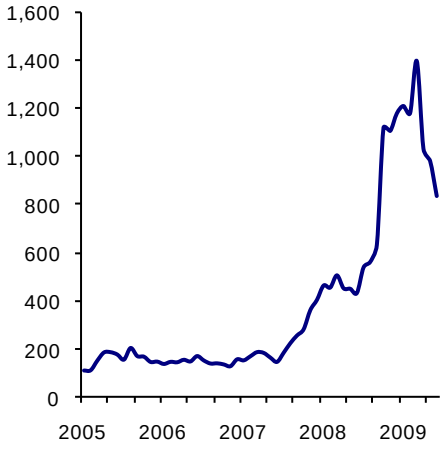
Annual change in the dollar balance in percent



Figures as of March, 2009.
Source: Banco de México.

b) Spread on the International Corporate Debt Yields of Non-Financial Resident Firms [1/]

Basis points



Figures as of June, 2009.
Source: Banco de México with data from Bloomberg.

1/ Spread versus the risk-free rate of 5Y US Treasuries.

Non-financial private firms' domestic debt market

As previously explained, companies in emerging economies faced major difficulties and/or higher financial costs to borrow at international financial markets. Until September 2008, turbulence in the international markets had not significantly hurt the domestic debt market. Hence, during the first three quarters of 2008, security issuances became an alternative source of funding for non-financial private companies. Thus, while between 2004 and 2007 the private debt of non-financial firms in this market grew at an average annual rate of 2.7 percent, in the first three quarters of 2008 average growth shot up to 19.3 percent. It should be noted that, parallel to the increased uncertainty prevailing at the time, the biggest growth was in short-term debt instruments. Between December 2007 and September 2008, the share of short-term debt instruments in this market rose from 5.9 percent to 12.8 percent.

The deepening of the financial crisis in mid-September 2008 triggered a rapid deterioration in debt market conditions. The deterioration in risk perception following the bankruptcy of Lehman Brothers was characterized by a sudden shortage of liquidity in the debt market and, consequently, a sharp fall in the rate of new debt placements, shorter placement maturities, and a rise in interest rates.

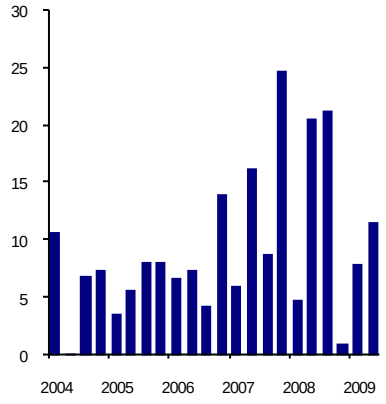
The more astringent financial conditions have reduced debt market growth. In June 2009, the balance of non-financial private firms' debt instruments registered a real annual contraction of 1.5 percent (Graph 24b). In particular, conditions prevailing in the debt market have led to a strong reduction in medium-term financing for firms. Quarterly average growth rate in medium-term debt instruments, both in the fourth quarter of 2008 and in the first two quarters of 2009, was only slightly above half the average placement rate for the period January-September 2008 (Graph 24a). This decrease in the placement rate of

new medium-term debt issuance gave way to a real annual contraction of 3.2 percent in the outstanding stock of these securities for June 2009 (Graph 24b).

Regarding the financial cost in the private debt market, as of the fourth quarter of 2008, interest rates began to show conditions of greater stringency and there was less liquidity across financial markets. In December 2008, average interest rates on short and medium-term peso-denominated debt rose to 10.37 percent and 10.58 percent respectively, 237 and 218 basis points above their previous year levels (Graph 24c). Subsequently this financial cost gradually decreased. In June 2009, the average interest rate on a short-term debt issue was 425 basis points below its December 2008 level. During the same comparison period, the reduction in the average interest rate on medium-term debt was of 249 basis points.

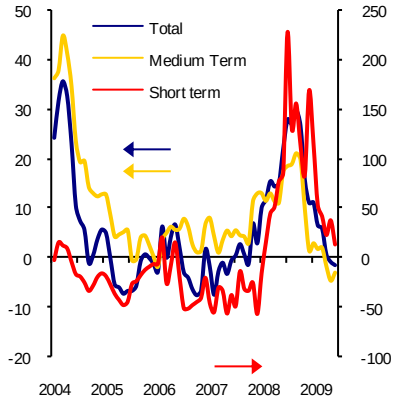
Graph 24
Non-Financial Private Firms' Debt

a) Medium-Term Debt Issued



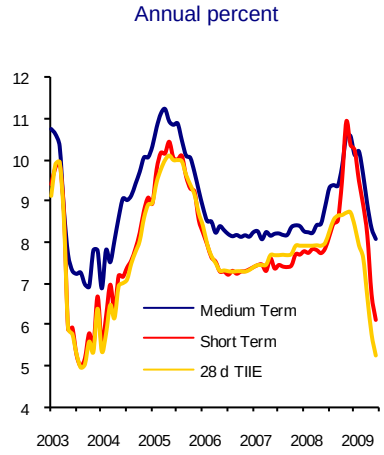
Figures as of June, 2009.
Source: Banco de México.

b) Short and Medium-Term Debt



Figures as of June, 2009.
Source: Banco de México

c) Interest Rate on Short and Medium-Term Debt



Figures as of June, 2009.
Source: Banco de México

Bank credit to non-financial private firms

Growth in bank credit to non-financial private firms has slowed down. Commercial bank performing direct credit to firms, which towards the end of 2007 and during the first few months of 2008 registered real annual growth rates of above 30 percent, recorded a real annual growth of just 7.9 percent in May 2009 (Graph 25a). It should be noted that starting at the fourth quarter of 2008 real annual growth in this type of credit shows, in addition to the increase in financing, the valuation effects of the foreign currency-denominated credit portfolio.[29]

Recent Credit Market Survey results reflect the perception among companies that acquiring bank credit became more difficult as of the fourth quarter of 2008. Of those surveyed companies who did not resort to bank credit, the percentage which cited more restrictive conditions as a limitation to acquire bank credit rose from 29.3 percent, in the third quarter of 2008, to 49.1 and 44.8 percent, in the fourth quarter of 2008 and in the first quarter of 2009 respectively. Regarding the cost of bank credit, one has that in the third quarter of 2008 about 29.3 percent of this group of companies mentioned an increase in interest rates as a drawback to employ credit, and by the fourth quarter of 2008 and the first quarter of 2009 that same percentage rose to 49.8 and 38.5, respectively.

As of the fourth quarter of 2008, maturities of bank credit to non-financial private firms became shorter. Peso-denominated loans to this sector, with maturities of less than 90 days, shrunk from 59.5 percent, during the first three quarters, to 67.8 percent of the total, for sometime between October 2008 and May 2009.

In response to greater credit restrictions, development banks increased the amount of direct credit granted to firms, which has partially offset the aforementioned slowdown in commercial bank credit. In May 2009, development banks' direct performing credit to non-financial private companies surged by a real annual 56.3 percent compared to a real annual growth of just 0.1 percent for the previous year.

[29] In May 2009, commercial banks' foreign currency-denominated credit expressed in pesos registered real annual growth of 1.2 percent while the year-on-year variation in the balance expressed in dollars decreased by 15.8 percent.

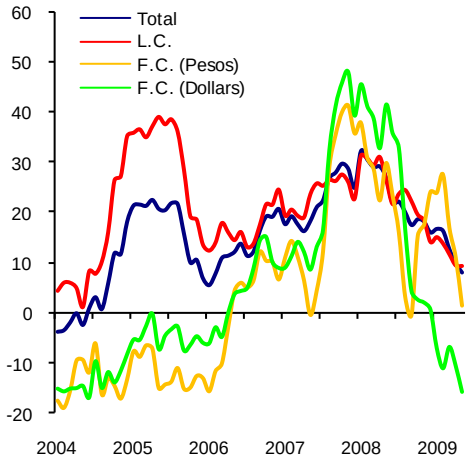
Private firms' non-performing loans portfolio

As of the first quarter of 2009, the adjusted delinquency rate on credit granted by commercial banks to non-financial private firms rose while still remaining at low levels.[30] In March 2009, this rate stood at 2.1 percent compared to 1.4 percent for the same month a year before (Graph 25b).

Graph 25
Commercial Bank Credit to Non-Financial Private Firms and Non-Financial Private Firms' Adjusted Delinquency Rate

a) Firms' Performing Loans[1/]

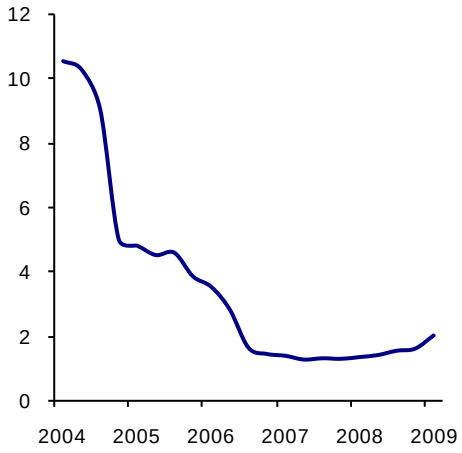
Real annual change in percent



Figures as of May, 2009.
Source: Banco de México.

b) Adjusted Delinquency Index[2/] of Credit to Firms

Percent



Figures as of March, 2009.
Source: Banco de México.

1/ Takes into account the direct performing loan portfolio.
2/ The adjusted delinquency rate is defined as total direct non-performing loans plus any write-offs or losses recognized by banks in the twelve previous months divided by total credit portfolio plus any of the abovementioned write-offs or losses.

Private Firms' debt service

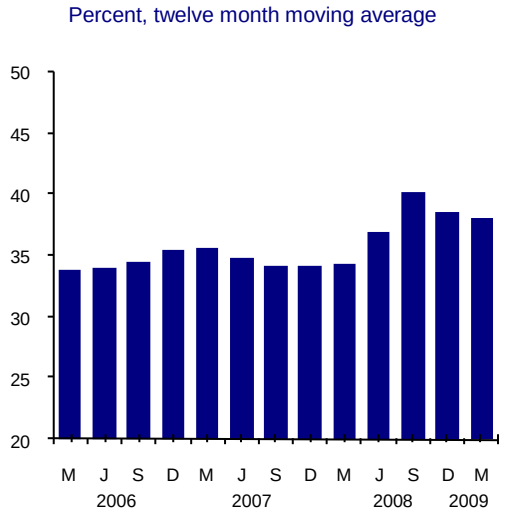
The debt servicing of non-financial private firms (capital and interest) has increased in relation to the recent past levels due to, among other factors, an increase in lending rates and a change in the debt profile in favor of a shorter term debt. During the first quarter of 2009, companies' servicing of commercial bank debt as a percentage of total debt with such banks was 38.1 percent, compared to 34.3 percent a year earlier (Graph 26a).[31] The servicing of debt obtained from domestic security issuances as a percentage of the total balance of such securities increased from 30.2 percent in the first quarter of 2008 to 35.4 percent in the same quarter of 2009 (Graph 26b).

[30] The adjusted delinquency rate of multiple bank credit granted to non-financial private companies is the total of non-performing direct loans plus any write-offs or losses recognized by banks in the twelve previous months divided by total credit portfolio plus any of the abovementioned write-offs or losses. The credit portfolio used for this rate is obtained from the bank balances published by Banco de México, which provide a disaggregation into sectors for the credit granted to non-financial private companies resident in the country, different to the disaggregation used by the National Banking and Securities Commission.

[31] Bank debt service of non-financial private companies corresponds to estimated amortizations and payment of quarterly interest of domestic debt with the commercial banking sector based on collection data.

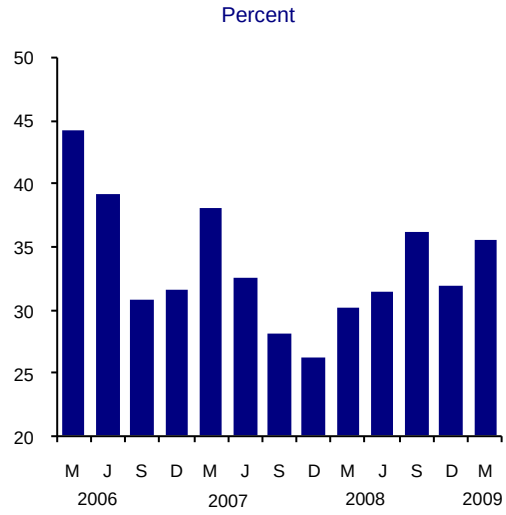
Graph 26
Non-Financial Private Firms' Debt Service

a) Commercial Bank Debt Service of Firms as a Percentage of Total Debt[1/]



Figures as of March, 2009.
Source: Banco de México.

b) Firms' Domestic Debt Service as a Proportion of Total Debt [2/]



Figures as of March, 2009.
Source: Banco de México

1/ Bank debt service of non-financial private companies corresponds to estimated amortizations and payment of quarterly interest of domestic debt with the commercial banking sector based on collection data.
2/ In the case of debt service of securities issued domestically by non-financial private companies, amortization corresponds to maturities accumulated throughout the quarter, while interest payments are calculated on the basis of the amount of securities outstanding and interest rates weighted per instrument.

3.5. The public sector

Public sector borrowing requirements

During 2008 the economic slowdown and drop of oil prices translated into a reduction in public revenue, especially in the fourth quarter of the year. Nevertheless, public finance results were in line with the 2008 targets stated in the Budget approved by the Mexican Congress. They include a traditional public balance equilibrium and the absorption of the fiscal cost of the ISSSTE Reform Act (Reforma a la Ley del ISSSTE), which consisted mainly of recognizing a contingent liability, the amount of which was unknown at the time the Budget was approved, because it depended on the number of workers who would opt to switch pension schemes. In 2008, this fiscal cost amounted to 292 billion pesos, equivalent to 2.4 percentage points of GDP.[32] Although this cost had an impact on the PSBR and short-term public debt, it is important to mention that the new pensions scheme puts less pressure on public finances in the medium term.

Excluding the fiscal cost of the ISSSTE Reform Act, during 2008 the PSBR represented 1.8 percent of GDP, or double the 2007 level (0.9 of GDP) while the traditional public balance recorded a slight deficit of 0.1 percent of GDP (Graph 28a).[33]

The increase in PSBR in 2008 was due mainly to greater demand for financing from Long-Term Productive Infrastructure Projects (Pidiregas) and credit granted by development banks and funds. Greater financing to Pidiregas mostly reflects growth in public sector investment, which accounted for 4.6 of GDP in 2008 (its highest level since the mid-1980s, although the annual target was 4.8 percent of GDP). There was also an expansion of development banks credit during the final months of 2008 in order to help Mexican firms overcome domestic and external financing restrictions.

During 2008, and excluding the fiscal cost of the ISSSTE Reform Act, more resources were available to the public sector than in previous years in terms of the traditional public balance (economic balance) due to a combination of

[32] Under the new ISSSTE Reform Act active public sector workers were given a period (from January to November 14th, 2008) to choose either to remain in the previous pension scheme or to opt out. The difference between the two schemes resided in the former being a joint defined-benefits scheme and the latter being an individual accounts scheme with only defined contributions. The fiscal cost of the new ISSSTE Reform Act consisted of two parts, the first a recognition bond and cash deposits amounting to 221.1 billion pesos which were deposited in the individual accounts of workers who had opted out, and the second a 70.9 billion transition bond covering the provisions required to meet spending pressures over the following 4 years derived mostly from an increase in Federal Government contributions, one-time transfers to the ISSSTE, lost contributions when making deposits in individual accounts, interests on liabilities assumed in relation to the change in the pension scheme, and voluntary workers' contributions. It should be noted that as mentioned in section 3.2, at 2008 the impact of the reform on public debt measured by HBPSBR amounted to 270.5 billion pesos (2.2 percent of GDP) a figure which differs from the fiscal cost, as the impact on public debt includes pension bond amortizations and variations in cash deposits during December 2008.

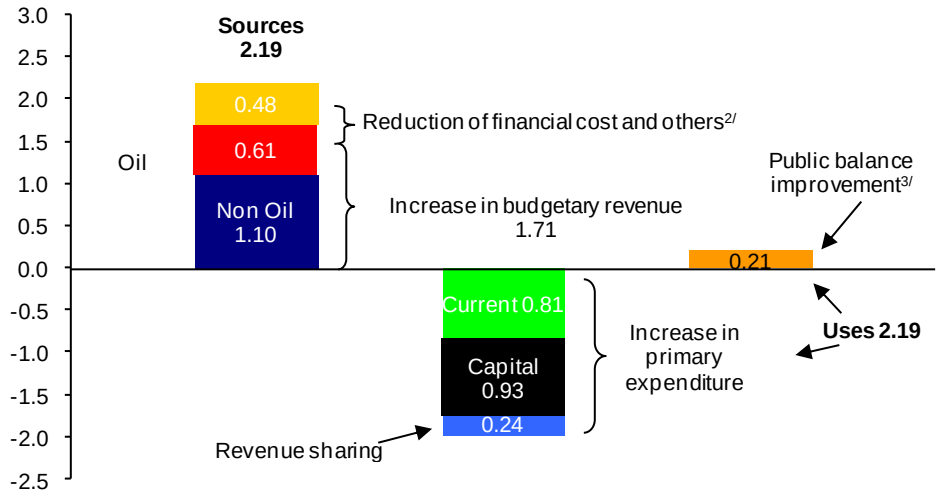
[33] Public Sector Borrowing Requirements (PSBR) data were calculated by Banco de México using the source of financing methodology (accrued deficit) and differ from the calculation made by the Ministry of Finance using the public sector revenue and expenditure methodology (cash deficit). PSBR data correspond to a broader measurement of the public balance as they include the traditional public balance, financing flows to cover federal government additional liabilities (Pidiregas, FARAC, IPAB and Debtor Support Programs), financial intermediation of the development banking sector, official development funds, and trusts. The traditional public balance or economic balance measures the operating results (revenue minus expenses) of the non-financial federal public sector over a given period. This sector comprises the Federal Government and non-financial agencies/entities and enterprises under direct and indirect budgetary control.

higher budgeted revenues and a lower financial cost of public debt (Graphs 28b and 28c). This can be examined in greater detail using a sources and uses of funds approach in which sources represent additional resources available to the public sector as a result of higher revenue or lower expenditure while uses indicate how these funds were allocated. Results for the period 2007-2008 are then compared with the period 2003-2006.[34]

Graph 27
Public Revenue, Spending and Balance [1/]

Difference between the 2007-2008 value and the annual average for the period 2003-2006

Percentage of GDP



Annual figures through 2008.
Source: SHCP.
1/ Does not include the fiscal cost of the Social Security Reform Act (Reforma a la Ley del ISSSTE). Figures may not add up due to rounding.
2/ Includes a reduction of 0.08 percent of GDP in debts from previous fiscal years (Adefas).
3/ The improvement in the public balance includes an increase in the non budgetary surplus equivalent to 0.03 percent of GDP.

Using this approach, compared to 2003-2006, during 2007-2008 the public sector had additional resources equivalent to an annual average of 2.2 percentage points of GDP due to three factors: i) higher non-oil revenue amounting to 1.1 percent GDP; ii) higher oil revenue amounting to 0.6 percent of GDP; and iii) a reduction in the financial cost of public debt amounting to 0.5 percentage points of GDP (Graph 27).

Greater resources in 2007-2008 versus the 2003-2006 average were used to improve the public balance by 0.2 percent of GDP and to increase primary expenditure by 2.0 percent of GDP. With respect to the latter, 0.8 percentage points were allocated to higher current expenditure, 0.9 percentage points to higher capital expenditure, and 0.2 percentage points to an increase in federal and municipal revenue sharing.[35] It should be pointed out that these primary expenditure increases are compared with a period in which increases in such

[34] 2003-2006 was chosen as the comparison period because base 2003 GDP is only available as of that year.

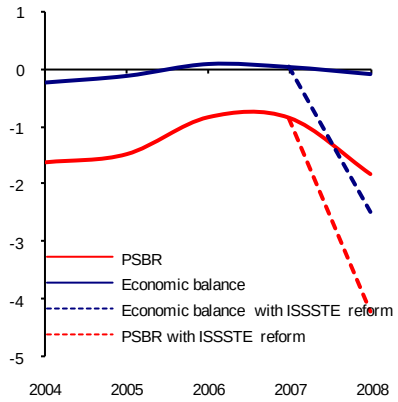
[35] The capital spending momentum is partly the result of rules governing the distribution of surplus revenues defined in the Federal Budget and Financial Responsibility Law, which tend to favor spending on federal and state physical investment.

expenditure headings had already been recorded, especially in current expenditure.[36]

The increase in available resources during 2007-2008 compared with 2003-2006, which resulted in higher primary spending and an improvement in the economic balance, contrasts with the situation the public sector could face in 2009 and 2010. As explained further on in this report, this situation stems firstly from changes to the Federal Budget and Financial Responsibility Law (Ley Federal de Presupuesto y Responsabilidad Hacendaria, LFPyRH), which contemplates a traditional public balance deficit equivalent to Pemex investment, and secondly from conditions currently faced by public finances which point to lower oil revenue and non-oil fiscal revenue. These two factors could lead to a reversal in surplus funds enjoyed in previous years with the consequent adverse impact on some primary spending headings.

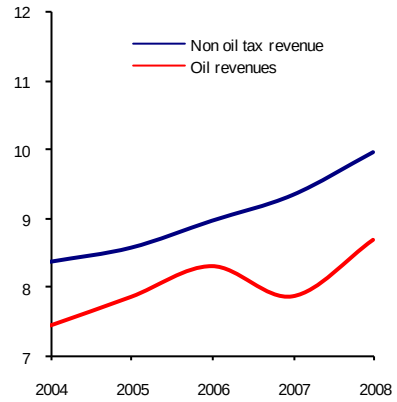
Graph 28
Fiscal Indicators

a) Economic Balance and Public Sector Borrowing Requirements (PSBR) 1/



Figures as of end-2008.
Source: SHCP and Banco de México.

b) Oil Revenue and Non-Oil Fiscal Revenue



Figures as of end-2008.
Source: SHCP.

c) Financial Cost of Public Budgetary Debt 2/

Figures as of end-2008.
Source: SHCP.

1/ Banco de México methodology. Does not include the fiscal cost of the Social Security Reform Act (Reforma a la Ley del ISSSTE).
2/ The total financial cost of the public budgetary debt (federal government, and entities end enterprises) comprises interest, commissions and public debt expenses, as well as hedging expenses. Debt amortizations are not included in this item.

During 2008, given the deterioration of the global economic growth prospects and their repercussions on the Mexican economy, the Federal Government announced three fiscal measure programs aimed to mitigate such effects: the Economic Support Program in March, the Household Support Program in May, and the Program for Employment Growth (PICE) in October. The first two programs contained measures aimed mostly at lowering companies' costs and tax burden as well as protecting household income and facilitating access to consumer staples. Neither of the programs put pressure on public finances because they did not change the fiscal balance's annual target.

The PICE was implemented in response to the deepening of the economic slowdown in the fourth quarter of 2008 and the gloom expectations for

[36] See the 2006 Financial System Report.

2009. PICE included measures aimed at boosting domestic demand through greater public investment in infrastructure and an increase in direct and induced credit from development banks. These measures were incorporated in the 2009 budget approved by the Mexican Congress in which the public balance equilibrium target was revised to a 227.5 billion pesos deficit (an estimated 1.8 percent of GDP).

In this regard, changes made during 2008 to the normative framework of public finances should be highlighted, in particular two aspects of the LFPyRH. On one hand Pemex's Pidiregas investment scheme was cancelled, therefore, as of 2009 investment in the company will be financed exclusively with budgetary resources. On the other hand, the balanced budget target excludes Pemex's physical investment. Therefore based on current legislation in the coming years this target implies a fiscal deficit equivalent to Pemex's investment amount.[37]

These changes will have two main effects as of 2009. First, by excluding investment in Pemex from the public deficit target, greater fiscal room was created allowing higher expenditure which during 2009 will permit to carry out the infrastructure investment contemplated under PICE; second, this additional spending implies a higher fiscal deficit and so the public sector will require greater domestic and external financing during 2009.[38]

In January 2009, the Federal Government announced the National Agreement for Household and Employment Support (ANEFE) with the participation of the public, private, and social sectors in order to broaden and strengthen measures aimed at lessening the effects of the international financial crisis on the Mexican economy. Under the Agreement, the federal authorities committed to stimulate domestic market growth through higher public spending, increases in development bank credit and measures aimed at increasing the income available for households and firms.[39]

The reduction in the price of oil and the sharp contraction in economic activity due to the external demand shock and knock-on effect on domestic demand, as well as the temporary negative impact on the economy of the human influenza A (H1N1) episode and temporary shutdowns in the car industry have resulted in reductions to projected oil and tax revenues.[40] The reduction in public revenues has generated uncertainty about public finances' room for maneuver in

[37] The LFPyRH only contemplates the approval of a fiscal balance deficit greater than Pemex investment in exceptional and temporary circumstances.

[38] A third effect is the January 2009 increase in public sector budgetary debt due to a reclassification of Pidiregas liabilities from non-budgetary to budgetary debt of Pemex. However, the level pertaining to the broadest definition of public debt (which includes additional liabilities) will not be affected, only its composition (as additional liabilities will decrease in the same proportion as the increase in budgetary debt).

[39] According to the Finance Ministry, public spending related to the National Agreement For Household and Employment Support, ANEFE, will not lead to a bigger budgeted deficit than the one approved by the Mexican Congress for 2009. Sources of funds for financing this spending will comprise 2008 surplus public revenues, savings and approved public spending economization as well as surpluses in some 2009 revenue headings (non-tax and oil revenues due to peso depreciation).

[40] In order to lessen the effects of the flu epidemic on the economy, the Federal Government granted diverse tax benefits: a 20% discount on employer social security (IMSS) contributions; allowing excess business taxes (IETU) to be credited to income tax (ISR) in monthly tax returns; a tax subsidy of up to 25% for states offering a tax exemption on payrolls and lodging; and a temporary discount of 50% on immigration and airspace use rights. Financial support was also announced for specific sectors (Pymes, aviation, and swine breeding) through loans and guarantees granted by the development banks. See the Finance Ministry's 023/2009 press release.

2009, and particularly for 2010. The Ministry of Finance and Public Credit (SHCP) has announced that for 2009 it has access to non-recurrent revenue sources which should help partially offset lower budgetary revenues.[41] These sources consist of oil hedges (secured at an oil price of US$70 per barrel), Banco de México's operating surplus corresponding to 2008 (delivered in April and amounting to 95 billion pesos), the use of revenue from the Hydrocarbon Stabilization Fund Right (Derecho sobre Hidrocarburos para el Fondo de Estabilización) and Oil Revenue Stabilization Fund resources (Fondo de Estabilización de los Ingresos Petroleros). Furthermore, a 35 billion pesos cut will be made to the approved amount of federal public administration current operating expenditure for the year in order to maintain the deficit projected in the Federal Revenue Law of 2009.[42]

With regard to 2010, the Ministry of Finance estimates that although the economic activity will recover and that there will be some non-recurrent revenues, total public revenues will fall short of the 2009 approved amount. Therefore, in order to maintain a fiscal deficit similar to 2009, in 2010 fiscal measures will be needed to offset the shortfall.

Public debt structure

During the first three quarters of 2008 the Federal Government continued with the policy begun in previous years of improving the payment conditions and risk profile of public debt in terms of the maturity, interest rate, and exchange rate. However, in the fourth quarter of the year, actions were also taken to mitigate liquidity problems in domestic markets due to the deterioration in conditions for accessing domestic and external financing in the form of a medium and long-term government security repurchase program as well as a larger issuance of short-term bonds.

At the first quarter of 2009, the Net Broad Economic Debt (NBED) balance amounted to 29.0 percent of GDP, 14.8 percentage points above its end-2007 level.[43] This increase can be mainly attributed to: i) the recognition of obligations generated by the ISSSTE Reform Act (undertaken in December, 2008); ii) the recognition of liabilities related to Pemex Pidiregas as direct public debt, which led to a larger increase in the NBED's external component; and iii) greater net domestic indebtedness.[44] This result broke the declining trend in public debt between 2004 and 2007. Regarding their composition, NBED domestic liabilities accounted for 63.8 percent of the total as of March, 2009 (77.6 percent in 2007), while external liabilities reached 36.2 percent (22.4 percent in 2007). Total Public Sector Debt, which besides NBED includes Additional Liabilities, accounted for 37.9 percent of GDP as at the first quarter of 2009, an increase of 10.4 percentage points of GDP versus its 2007 level (Graph 29a).

[41] See "Document related to compliance with the provisions of article 42, paragraph i) of the Finance Ministry's Federal Budget and Financial Responsibility Law (2009)".

[42] See the Finance Ministry's 023/2009 press release.

[43] Net Broad Economic Debt includes the net liabilities of the Federal Government, the state sector, development banks and development trusts.

[44] The increase in public sector debt as a result of the ISSSTE Reform Act amounted to 270.5 billion pesos (2.2 percent of GDP) and differs from the amount reported in the PSBR section (292.0 billion pesos), because the impact of public debt includes pension bond amortizations and variations in deposits during December 2008 while the amount corresponding to PSBR represents the original fiscal cost of the ISSSTE Reform Act at the beginning of that month.

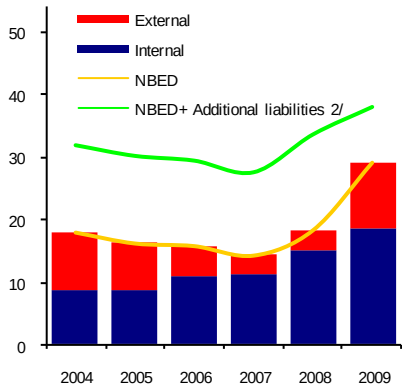
Regarding Consolidated Public Sector debt with Banco de México, it represented 27.9 percent of GDP as at end-March (14.6 at end-2007). Worth highlighting is the consolidated public sector's net external creditor position with Banco de México, which has decreased from 577.2 billion pesos in December 2007 to 38.8 billion pesos in March 2009 (Graph 29b).[45] Part of this change in the net external creditor position is due to the recognition of liabilities related to Pemex's Pidiregas as direct public debt.

As mentioned previously, in the first three quarters of 2008 the Federal Government maintained its strategy of prioritizing the use of long-term peso debt, improving the cost and maturity of external debt and reducing external indebtedness. The warrants exercised in October but issued in April 2008 were a key part of this strategy. The transaction was divided into two steps, the first consisting of an exchange of dollar-denominated Bonos UMS (832.5 million dollars) and euro-denominated Bonos (8.8 million euros) for fixed-rate peso-denominated Bonos (Bonos M), and the second an exchange of dollar-denominated Bonos UMS (225.3 million dollars) for Udibonos.[46]

Graph 29
Public Debt

a) Net Broad Economic Debt[1/]

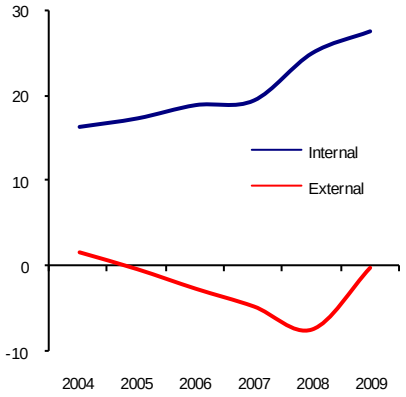
Percentage of GDP



Figures as of March, 2009
Source: Banco de México.

b) Public Net Debt Consolidated with Banco de México[3/]

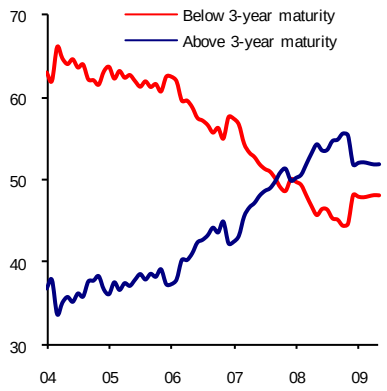
Percentage of GDP



Figures as of March, 2009.
Source: Banco de México.

c) Federal Government Securities by Maturity[4/]

Percentage of GDP



Figures as of May, 2009.
Source: Banco de México.

1/ The net broad economic debt includes net liabilities of the federal government, the state sector, and official financial intermediaries (development banks and development trust funds).
2/ Additional liabilities correspond to Pidiregas, FARAC, IPAB and the Debtor Support Program.
3/ Public sector net debt consolidated with Banco de México includes assets and liabilities of the central bank with the private sector, and the commercial banking sector and the external sector. This concept does not include additional items.
4/ Residual maturity or term to maturity.

In 2008 and the first quarter of 2009, 5 billion dollars in Global Bonds were issued. In particular, the December 2008 placement amounting to 2 billion dollars and maturing in 2019 and the January 2009 placement for 1.5 billion dollars maturing in 2014 met all of the Federal Government's 2009 financing

[45] The public sector consolidated with Banco de México includes in NBED (excluding additional liabilities) the assets and liabilities of the central bank with the private sector, commercial banks, and the external sector.

[46] The warrants which permitted the exchange of external debt for domestic debt matured on October 9th, 2008.

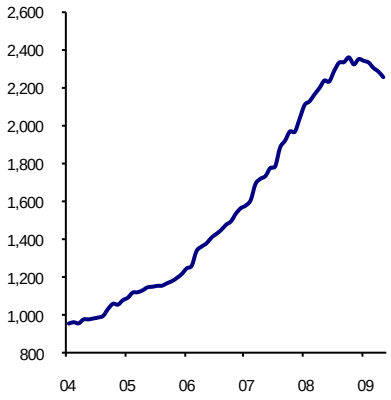
needs, although given the international financial market conditions the spread was higher than the one paid at the beginning of 2008.[47]

On the domestic market side, during the first three quarters of 2008 the composition of the Federal Government securities portfolio continued to favor the issuance of long-term fixed-rate instruments in pesos and in UDIs. However, in the last quarter of the year there was an increase in the amounts placed in short-term instruments (versus January and September, 2008). (Graph 29c). This change in the maturity structure was aimed to mitigate the liquidity problems in local markets. An additional measure consisted of a medium and long-term government securities repurchase program through auctions.[48]

Graph 30
Public Debt Service

a) Weighted Average Maturity

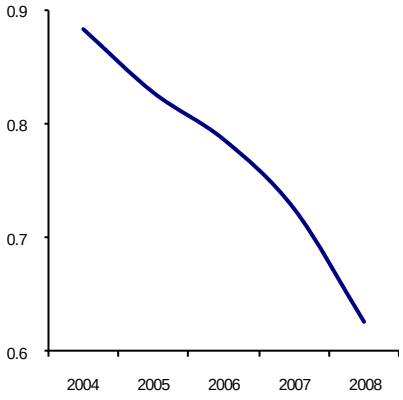
Number of days



Figures as of May, 2009.
Source: Banco de México

b) Domestic Government Securities Borrowing Requirements

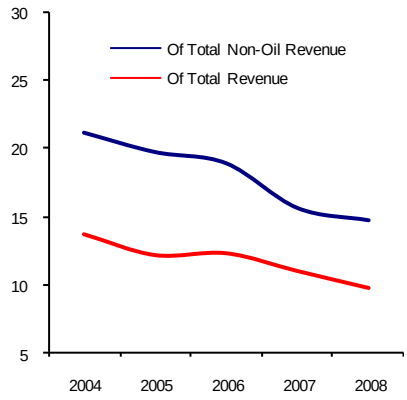
Number of times [1/]



Figures as of December, 2008.
Source: Banco de México

c) Federal Government Debt Interest Payments as a Proportion of Revenues

Percent



Figures as of December, 2008.
Source: SHCP

1/ Refers to the number of times per year the average balance of Federal Government domestic securities is refinanced.

As a result of the aforementioned actions the rising trend in the weighted average maturity of the securities was reversed.[49] (Graph 30a). Despite this the average weighted maturity was longer than the end-2007 level, increasing from 2,036 days to 2,254 days in May 2009. By extending this average maturity period, the frequency with which these securities must be refinanced was reduced (Graph 30b).

[47] In January 2008, the spread versus US Treasury Bond (USTB) was 170 basis points while in the case of the December 2009 and January 2009 issuances the spreads were 390 and 425 basis points, respectively. See the Ministry of Finance 005/2009 press release.

[48] The government repurchase program involved Bonos M and Udibonos. In the case of the former, 33.0 billion pesos was auctioned with 4.3 billion assigned while in the case of the latter, 1.680 billion UDIs were auctioned and 712.6 million assigned.

[49] The average weighted maturity is defined as the weighted sum (versus the nominal outstanding value) of the remaining maturity of each current security.

Financial cost of federal government debt

During 2008, the financial cost of Federal Government debt remained constant in GDP terms (1.7 percentage points in 2007 and 2008). In terms of Federal Government revenue the cost decreased from 11.0 percent in 2007 to 9.8 percent in 2008 due to higher revenues in 2008 (Graph 30c).

State and municipality debt

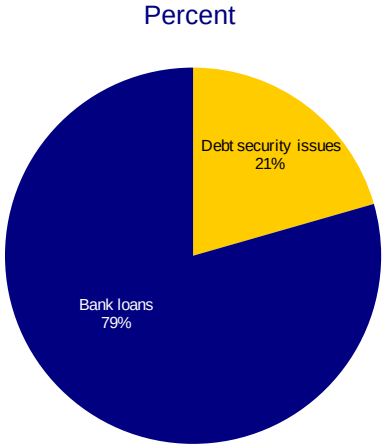
The stock of state and municipality debt (including their respective entities) grew 2.4 percent in real terms between December 2007 and March 2009 taking it to 1.6 percent of GDP as at the first quarter of 2009. 79.4 percent of that stock corresponded to banking debt and 20.6 percent to securities (Graph 31a). The ten states with the largest amount of debt accounted for 76.6 percent of total obligations for state and municipal authorities, similar to end-2007 (76.0 percent).

As at March 2009, the stock of debt of states and municipalities accounted for 47.8 percent of last 12 months federal sharing, below the end-2007 level (56.1 percent) (Graph 31b). The ten states with the largest debt ratio to federal sharing revenues averaged 72.1 percent (73.5 percent in 2007). The average debt maturity of states increased from 18.7 years in 2007 to 19.4 years in March, 2009 (Graph 31c). This was mainly the result of the debt restructuring undertaken by a number of states in the first half of 2008.

Given the prospect of a reduction in public revenues in 2009, the participation of states and municipalities in federal revenue sharing is expected to be lower during the year, in relation to both the programmed amount and the 2008 level. Although local governments are able to resort to a participation compensatory fund, the State Revenue Stabilization Fund (Fondo de Estabilización de los Ingresos de las Entidades Federativas, FEIEF), they may still face a revenue reduction with the consequent need for greater financing.

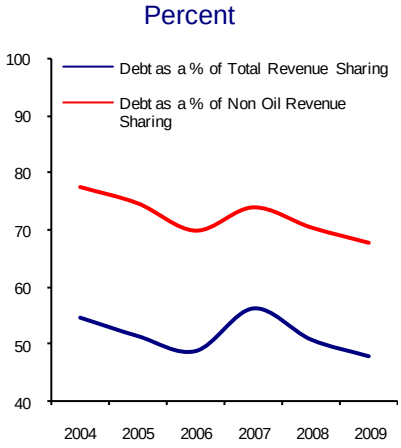
Graph 31
Debt of States and Municipalities

a) Structure of State and Municipality Debt



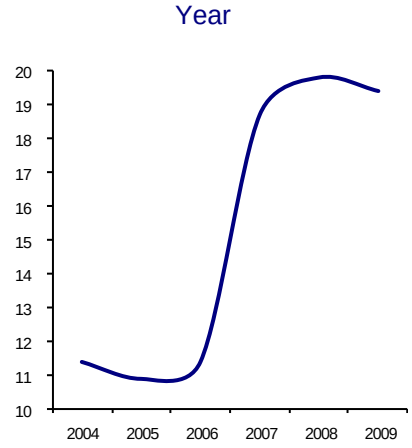
Figures as of March 2009.
Source: SHCP.

b) Debt of States as a Proportion of Revenue Sharing



Figures as of March, 2009.
Source: SHCP.

c) Weighted Average Maturity of State Debt in Securities



Figures as of March, 2009.
Source: SHCP.

4. Financial Markets

The intensification of risk aversion as of the second half of 2008 led to a significant deterioration in Mexican markets. The last time the foreign exchange market underwent a structural change of such size was in 1995 with the adoption of the floating rate regime. In capital markets, several companies saw their access to financing severely restricted and there was a considerably drop-off in activity in the secondary debt market. Although conditions have improved in recent months, those markets still face a situation which even lags pre-crisis levels.

This section examines the development of Mexico's foreign exchange and debt markets. It also includes some of the issues that have arisen from the over-the-counter derivative transactions of a number of companies. Mention is also made of measures taken to lessen the effects of the crisis along with an appraisal of those markets' current status. Finally, it is argued that the level of development achieved by local financial markets over the last decade has provided a solid base from which to tackle the challenges presented by the current crisis.

4.1. OTC Derivative and foreign exchange markets

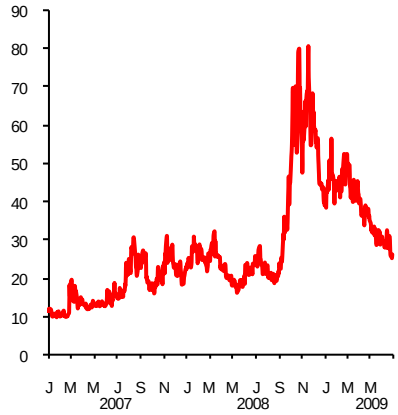
In the months prior to the bankruptcy of Lehman Brothers, the slowdown in economic activity, drop in foreign trade and lower revenue from remittances in Mexico had strongly reduced the foreign currency supply. As a result, liquidity in the foreign exchange market had receded, thus making it more vulnerable to events which would unfold in subsequent months.

Greater risk aversion (Graph 32a) as of September 2008 put downward pressure on capital flows to emerging economies and dampened investors' willingness to adopt positions of risk with a large number of financial intermediaries reducing their interest rate and foreign currency positions. Likewise, US investment banks, known for their active participation in foreign exchange markets, either went out of business or merged with other financial institutions,[50] which in turn led to a decrease in the number of possible counterparties for foreign currency transactions in pesos (Graph 32b). These circumstances were mirrored in the daily turnover of the foreign exchange market (Graph 32c) where they lowered the possibility of undertaking large transactions without these negatively impacting the exchange rate and raised transaction costs (Graph 33a).

[50] For example, the five largest US banks were counterparties in around eight percent of all foreign exchange transactions undertaken by Mexican-based financial intermediaries. The same banks currently participate in less than two percent of such transactions.

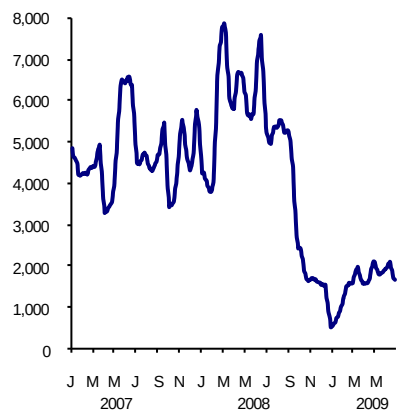
Graph 32
Peso Foreign Exchange Market

a) VIX Index [1/]



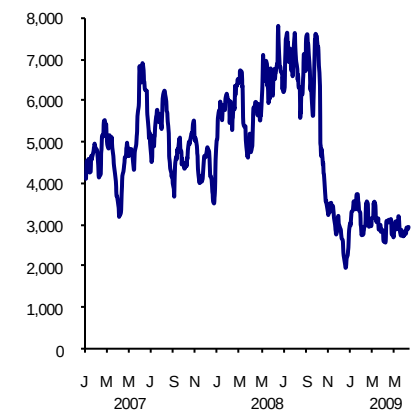
Figures as of June, 2009.
Source: Bloomberg.

b) Open Interest Peso-Dollar Contracts in the CME



Figures as of June, 2009.
Source: Chicago Mercantile Exchange.

c) Daily Turnover in Cash in the Mexican Foreign Exchange Market



Figures as of June, 2009.
Source: Banco de México.

1/ The VIX Index measures the volatility in options contracts on the S&P500 index and is used to demonstrate investor risk aversion.

Losses from OTC derivative transactions

Since Mexico adopted a floating exchange rate regime in 1995, the derivatives market in pesos has experienced virtually uninterrupted growth. The use of futures, forwards, swaps and options has helped increasingly deepen the market and has facilitated a more efficient management of the risks inherent to a floating exchange rate regime. Such instruments have enabled economic agents to lower, transform and eliminate undesired exchange rate exposure.

During the years prior to the current crisis, diverse participants in the foreign exchange market, including a number of Mexican companies, had entered into derivative transactions in order to hedge exchange or interest rate movements. Some of them had also taken advantage of the market's relative stability to assume positions in foreign exchange derivatives, which generated substantial profits whilever the exchange rate remained within a defined trading range, but the potential for considerable losses if it didn't, a situation which was, however, perceived as being very remote (Box 12).[51]

[51] One example of such structures is the "target forward".

Box 12

Derivative Strategies

Derivatives are financial instruments whose value depends on the price of another asset called the underlying. There is a broad range of underlying assets in the market --interest rates, exchange rates, commodities, the credit grade of a group of borrowers, credit defaults, and even other derivatives.

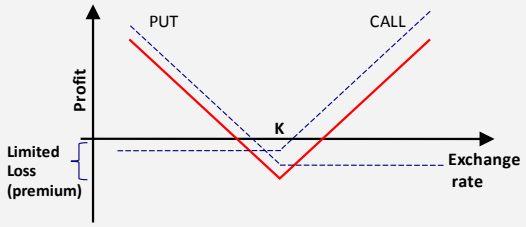
The instruments allow the buyer to lock in the future value of some underlying asset at the start of the contract. They are therefore used primarily for hedging purposes. Sometimes, however, their characteristics make them popular for speculative purposes as well.

Although there are a wide variety of strategies with derivative instruments and underlyings, we will only show the types that are built with options, and are based on expectations regarding the volatility and direction of the exchange rate.

Exchange-rate volatility strategies
This type of strategy comes into play when exchange rates are expected to be highly volatile, translating into substantial variations in the parity of a currency. The most common volatility strategies are the straddle and the strangle.

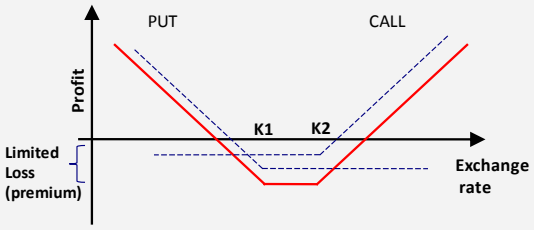
The straddle is a strategy involving the simultaneous purchase of a call and a put option with the same strike price and exercise date. This strategy is used when an investor believes that the exchange rate will move significantly, but is unsure as to which direction. Although the possible losses are limited to the cost of the option contracts themselves, the profits can be significant, and in theory, unlimited. This represents a potential loss for whoever takes the opposite position in the strategy.

Straddle (Long position)



The strangle is very similar to the straddle. The only difference is in the strike prices of the options. Under this strategy the put has a lower strike price than the call. Therefore, the strangle is used when extreme changes are expected in the exchange rate, but the investor is not sure of the direction. Since this strategy only provides a gain if the fluctuations are extreme and therefore higher than expected in a straddle, a strangle is cheaper. For the party taking the opposite position in the strangle, the losses may be significant, and in theory unlimited, in the event of a severe change in the exchange rate.

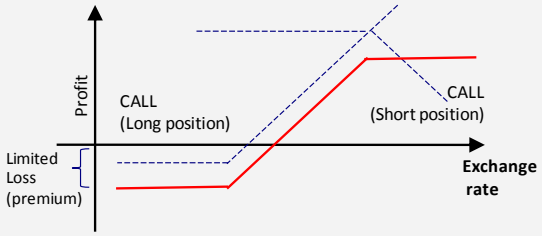
Strangle (Long position)



Directional exchange-rate strategies
This type of strategy is used when an investor expects moderate movements in the exchange rate in a certain direction. The most common strategies in this category are the bull and the bear spreads.

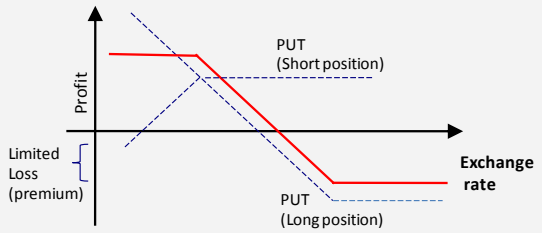
A bull spread is made by buying a call option at a certain strike price and selling another call option with a higher strike price and the same expiration date. This spread can also be formed using puts. This strategy is used when an investor expects a modest increase in the price of the underlying, and it can be obtained at a lower cost than simply acquiring a call. The profits and losses on the bull spread are limited, but can be magnified if investors use the relatively low cost of the strategy to leverage their position. In other words, when they buy or sell a large number of contracts within the strategy without hedging purposes.

Bull Spread (Long position)



The bear spread is made by selling a put with a certain strike price and buying another put with a higher strike price. Like the bull spread, this strategy can also involve calls. The spread is used when the exchange rate is expected to decline moderately, and it is cheaper than simply buying a put. Although profits and the losses are limited, they can be magnified depending on the investor's leverage.

Bear Spread (Long position)



So far, we have described very simple payment schemes. In practice, hedges that consist of setting a future price for the underlying and holding it until the contract expires are inefficient and costly, particularly when the underlying tends to be highly volatile. As an alternative, investors can pursue strategies involving more complex schemes. This brings us into the area of what are called exotic strategies, so named precisely because of the complexity of their design.

Exotic options
The price of an exotic option is generally determined according to the path of the underlying asset. Asian and barrier options are some examples of exotic options. There are also hedges that involve the combination of two or more derivatives (like KIKOs). Although hedges with exotic options and structured products may be much more attractive because of their design and cost, they also involve many risks that are much greater and harder to quantify.

Exchange-rate barrier options

Payment of these options depends on whether or not the exchange rate fulfills the conditions defined in the barrier.[1] For example, the value of the option is activated (knocks in) or canceled (knocks out) only when the exchange rate touches or surpasses the barrier defined in the contract. This barrier is determined according to an analysis of the expected trend in the exchange rate during the term of the contract. The risk associated with these contracts is closely related to exchange rate volatility levels. The higher the volatility, the greater the likelihood that the exchange rate will surpass the barrier.

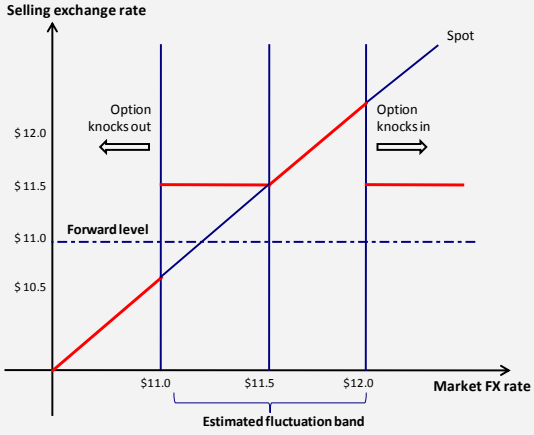
Structured products: Some examples

KIKO (Knock-In, Knock-Out)

Barrier options known as KIKOs (Knock-In, Knock-Out) are particularly attractive for exporters whose transactions are linked to currencies which value is expected to depreciate. They allow the exporter to sell at a fixed exchange rate (set at a higher level than the expected forward rate), and benefit from the possible appreciation of the dollar, as long as not surpasses a certain barrier. Although premiums in these contracts is lower than European-style options, but the hedge is incomplete. In this case, the losses are not limited and the hedge is only effective as long as the exchange rate remains within the range specified in the contract. If it touches or surpasses the barrier, the associated options knocks in or knocks out, and remain active whether or not the exchange rate returns to within the levels defined by the barrier. Once this happens, there is no going back.

Let us assume that the peso is expected to strengthen over a six-month period, without abrupt fluctuations. An exporter that is long in dollars[2] wants to guarantee future revenues, but also wants to reduce the usual premium cost, so he decides to acquire a KIKO. Through the KIKO, the exporter can sell dollars at an exchange rate of 11.5 pesos, which is above the forward level expected by the market (11 pesos). The scheme operates as follows: if expectations are met, and the peso continues to appreciate moderately, meaning if it does not move out of the fluctuation range defined in the contract (between 11.01 and 11.99 pesos), the exporter can lock in the sale of dollars at the agreed-upon price of 11.5 pesos, even though the dollar can be bought for less on the open market.

Barrier Options
Knock-In Knock-Out (KIKO)

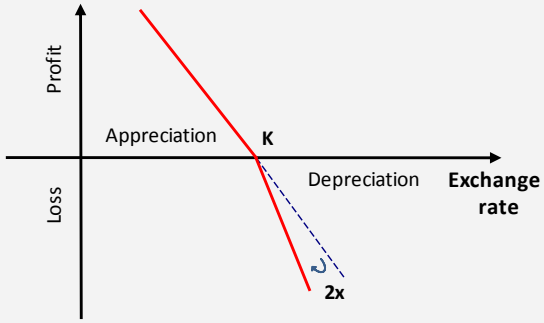


But if the exchange rate turns around and begins to depreciate against the dollar, two scenarios may arise: first, if the exchange rate following depreciation is still not higher than the upper barrier (12 pesos), the exporter can sell the dollars at market prices. Second, if the depreciation is so great that the peso moves beyond 12 per dollar, then the option "knocks in" and the exporter is obliged to sell the dollars at the strike price of 11.5 pesos. It does not matter if the dollar is more expensive (above 12 dollars) on the spot market. In the second scenario, the exporter would have to absorb the losses.

Target forward

The Target Forward is another type of structured product. It is comprised of an option and a forward that allows the holder to sell (buy) dollars at a more attractive exchange rate than the forward rate. At the inception of the contract, the target exchange rate, or target forward, is established. Although they are costless, the results are fairly risky, because they are only in one direction. In other words, they only provide profits when the exchange rate appreciates (depreciates) against the strike price. If the exchange rate moves in a direction opposite to what is expected, the level of losses doubles (first because of the loss on the forward, and second because of the loss linked to the option).

Target forward (Short position in volatility)

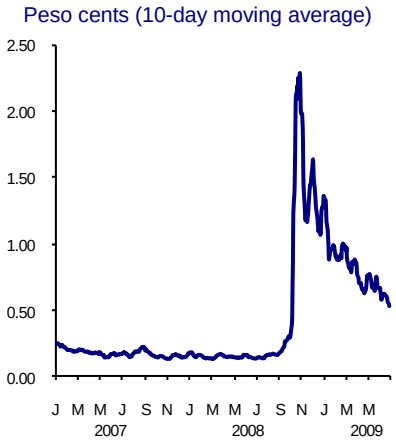


1. In this context, the barrier is the limit price of the underlying asset that triggers the option. The most common trigger events are the activation or cancellation of the option.
2. In financial jargon, someone is said to be "long in dollars" if they hold dollars (for example, an exporter), and therefore in order to sell them, they must take a "short" or selling position. If someone is "short in dollars" (an importer, for example), he must take a "long," or buying position.

This situation of stability was the one prevailing in October 2008 when increased risk aversion in international markets triggered an across-the-board depreciation of emerging market currencies. In Mexico the depreciation of the peso led to considerable losses in the foreign exchange derivative-related positions of a number of companies (Graph 33b). Said losses in turn led to huge demand for dollars to create collateral, leading to an even greater depreciation of the peso. Furthermore, some companies were unable to meet margin calls on their positions obliging their counterparties to demand dollars to meet their own risk positions (Box 13). This negative chain of circumstances caused the peso to depreciate 25 percent in the space of one month and pushed up implied volatility in peso-dollar option contracts from 8.0 percent to 60 percent during the same period (Graph 33c).

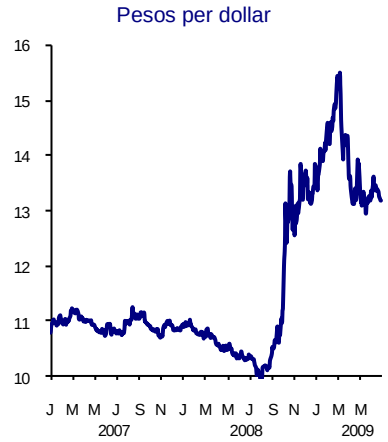
Graph 33
Peso Foreign Exchange Market

a) Buy/Sell Spreads



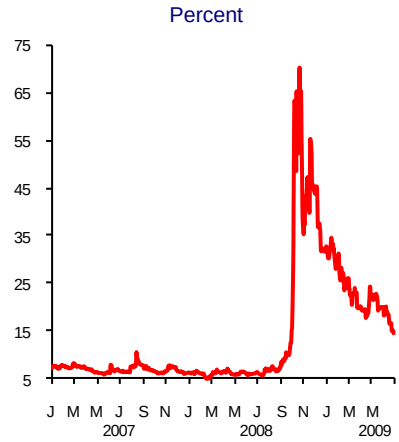
Figures as of June, 2009.
Source: Reuters.

b) Peso-Dollar Exchange Rate



Figures as of June, 2009.
Source: Reuters.

c) Implied Volatility in One-Month Peso-Dollar OTC Transactions



Figures as of June 2009.
Source: UBS.

Illiquid conditions prevailing in the foreign exchange market led the Foreign Exchange Commission to instruct Banco de México to undertake extraordinary dollar auctions. Like all Banco de México sales involving the peso, these dollar sales were undertaken with the Mexican financial institutions that had to meet clients' needs, in this case demand from companies or other counterparties requiring dollars for collateral or to unwind derivative positions. An additional measure the Foreign Exchange Commission implemented consisted of a daily dollar auction for providing the market with liquidity whenever the exchange rate depreciated by more than two percent versus the FIX exchange rate determined by Banco de México the previous day.

Box 13

Risks Inherent in Derivative Positions

Despite the advantages offered by derivatives, they must always be used under an appropriate scheme for measuring and controlling risk. In extreme scenarios, even the most common derivatives have the potential to generate enormous losses for their users. In effect, the losses suffered by some Mexican corporations came from their exposure to the foreign-exchange market through derivatives as simple as forwards or "plain vanilla" options. This box presents a simple example of how an exchange-rate forward can cause substantial losses for a corporation and put pressure on the foreign-exchange market.

Let us assume that in May 2008, company "A" knew that it would receive 100 million dollars within one year. If company "A" wanted to eliminate the risk of exchange-rate fluctuations, it could turn to bank "B" to take out a forward contract. Through this transaction, it would commit to sell 100 million dollar to the bank at the forward exchange rate set in the contract. So, through this transaction, company "A" would have eliminated its foreign-exchange risk. Bank "B" would in turn, seek to cover the FX risk implicit in the transaction by performing an opposite operation with bank "C" that is selling a forward contract for 100 million dollars.

Even though the exchange of currencies will take place in the future, the forward contract may, during its life, fluctuate in value. The table below shows the value of the position taken by company "A" under different exchange-rate scenarios.

To hedge the risk of holding a forward position, the party affected negatively by a change in valuation is often obliged to guarantee performance of the contract by putting up some guarantee or margin.

Continuing with this example, if the Mexican peso were to depreciate beyond the level agreed upon in the contract, bank "B" would have asked company "A" to deliver the guarantee (known as a margin call). This is settled in the contract, because with the depreciation of the exchange rate, the company could sell the dollars on the market for more pesos than what is agreed upon in the contract with bank "B". Thus, the latter would not be able to oblige the company to deliver the dollars included in the contract. Bank "B" would in turn have to provide margins to bank "C" for the position against it.

If the company is unable to continue meeting the margin calls, bank "B" would have to close the operation before the maturity day of the contract. If not, it would take the risk of incurring in even greater losses if the peso were to continue depreciating and the company could not cover its obligations on the expiration date of the contract. If the company cannot come up with the money at expiration, a liability would be generated in favor of bank "B" at the exchange rate as of that date. However bank "B" would still obliged to deliver 100 mdd to bank "C" at expiration, so it would be exposed to exchange-rate fluctuations. This would generate a demand for 100mdd by bank "B" on the market.

	May 2, 08	Jul. 31 ,08	Oct. 31, 08	Dec. 31, 08
Spot exchange rate* (cash)	10.4860	10.0345	12.7967	13.6483
Forward exchange rate* (May 09)	10.9846	10.4553	13.4131	14.1316
Contract exchange rate* (forward)	10.9846	10.9846	10.9846	10.9846
Dollars deliverable (mdd)	100	100	100	100
Pesos receivable (mdp)	1,098	1,098	1,098	1,098
Change in value of company "A" position (mdp)	0	49	-232	-306

*pesos per dollar

As of October 10th, Banco de México undertook daily dollar auctions amounting to 400 million dollars at a minimum assignment price equivalent to two percent above the previous day's exchange rate. This measure contributed to reduce uncertainty in the market during periods of low liquidity. The auctions were not often assigned because the market exchange rate was below the auction minimum.

Uncertainty in financial markets further intensified at the end of January. The ongoing deterioration in global economic conditions increased concern about the performance of the Mexican economy, in particular, doubts about the country's capacity to finance the current account deficit.

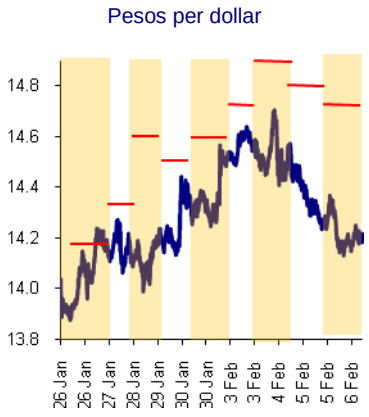
The prevailing illiquidity in the foreign exchange market caused that the actions of some participants had a disproportionate effect on the exchange rate. Thus, the peso depreciated daily to levels slightly below the minimum assignment price of the central bank's 400 million dollar auction (Graph 34a). As a result, although the peso was depreciating daily, it was not enough to trigger dollar auctions by the central bank.

This deterioration was reflected in the asymmetrical behavior of the peso versus indicators it normally bears a high correlation with, such as stock indices and other currencies in the Latin American region (Graph 34b and c). The Foreign Exchange Commission responded by instructing Banco de México to sell dollars directly in the foreign exchange market through the country's credit institutions. These interventions, which took place in early February, were aimed

at leveling exchange rate risk by providing enough liquidity to prevent some participants from taking advantage of an illiquid market. The direct dollar sales were successful at stemming the peso's weakening bias. Uncertainty arising from Banco de México's random interventions also contributed to ease exchange rate position risk imbalances.

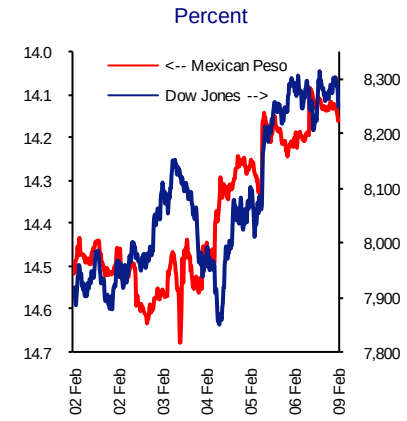
Graph 34
Foreign Exchange Market

a) Intra-day Exchange Rate and Auction Minimums



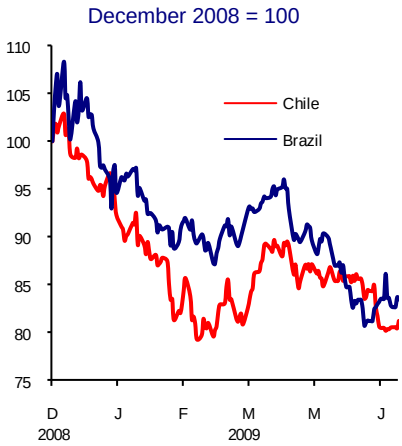
Figures as of February, 2009.
Source: Banco de México.

b) Peso-Dollar Exchange Rate and Dow Jones



Figures as of February, 2009.
Source: Banco de México.

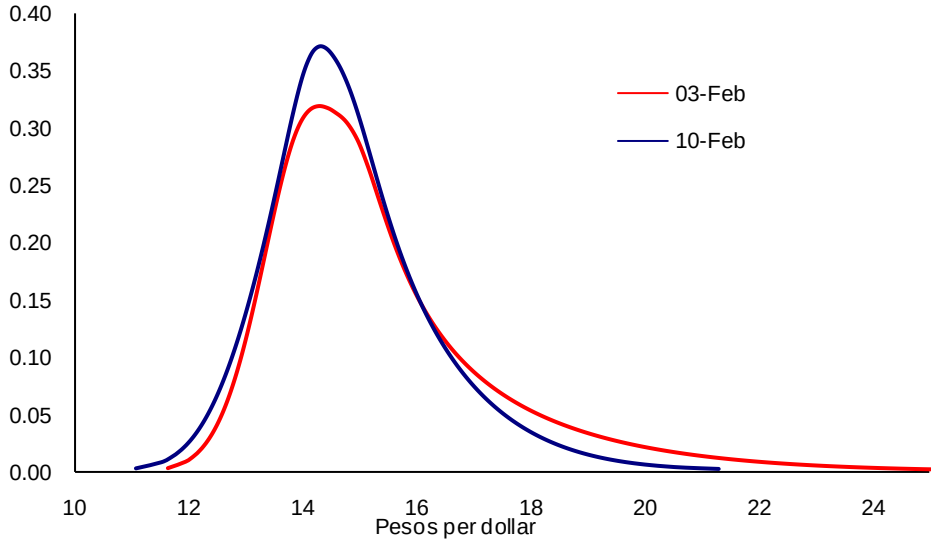
c) Peso-Dollar Exchange Rate Index versus the Currencies of Chile and Brazil



Figures as of July, 2009.
Source: Banco de México.

In order to complement the direct dollar sales, which because of its nature have a temporary effect, four pre-emptive measures were taken: i) the Foreign Exchange Commission examined the factors that would impact the balance of payments during the year: ii) a contingency credit line with the International Monetary Fund through a new Flexible Credit Facility amounting to 47 billion dollars was announced; iii) the intention to use the 30 billion dollar swap line secured from the United States' Federal Reserve was also announced. In April 2009, this enabled Banco de México to auction loans amounting to 3.2 billion dollars.

Graph 35
Implied density function of one-month OTC peso-dollar transactions



Source: Reuters.

In order to encourage more orderly conditions in the foreign exchange market, the Foreign Exchange Commission introduced a new mechanism for guaranteeing the sale of a large part of the year's projected international reserves in the foreign exchange market. The underlying expectation was that in the absence of Banco de México's interventions, public sector foreign currency revenue from oil exports, oil hedges and greater external financing would substantially increase international reserves (Box 14). Therefore, at the beginning of March, the Foreign Exchange Commission announced 100 million in daily dollar sales with no minimum price and a decrease from 400 to 300 million dollars in the amount offered under the dollar sale mechanism with a minimum assignment price. These measures, along with the recovery in global financial markets, have made the foreign exchange market more stable. Likewise, volumes traded have increased and the market has acquired more depth.

Table 7
Mexican Foreign Exchange Market Intervention Amounts
Million dollars

	2008			2009						Total
	Oct	Nov	Dec	Jan	Feb	Mar[1/]	Apr	May[2/]	Jun	
Extraordinary mechanism	11,000	-	-	-	-	-	-	-	-	**11,000**
Automatic mechanism (400 million dollars)	2,096	1,285	797	988	1,092	400	300	120	0	**7,078**
Direct sales	-	-	-	-	1,835	-	-	-	-	**1,835**
Automatic mechanism (100 million dollars)	-	-	-	-	-	1,600	2,000	2,000	1,400	**7,000**
Total	**13,096**	**1,285**	**797**	**988**	**2,927**	**2,000**	**2,300**	**2,120**	**1,400**	**26,913**

Source: Banco de México.
1/ The Foreign Exchange Commission reduces the auction amount with a minimum price to 300 million dollars from 400 million dollars.
2/ The Foreign Exchange Commission reduces the auction amount with a minimum price to 250 million dollars from 300 million dollars and the auction amount with no minimum price to 50 million dollars from 100 million dollars.

Box 14

Financing the Current Account Deficit

Analyzing the expected trend in the balance of payments based on Banco de México's 2009 projections (updated in May) we find that Mexico should be in a position to finance its current-account deficit without major problems. The balance of payments projection takes the following into account:

- Although the current account is expected to show a higher deficit due to a lower surplus in the oil trade balance, such increment will be limited by a reduction in the non-oil trade deficit as a result of the economic contraction.
- The capital account surplus is also expected to decrease, due primarily to the reduction in foreign direct investment, but the current-account deficit will be fully financed with resources from the oil hedge and long-term loans to the public sector from multilateral development banks (World Bank and Interamerican Development Bank).
- The government also has a flexible credit line from the International Monetary Fund, although it has no plans to draw upon it at present.[1]

In March 2009, it was estimated that, in the absence of interventions by Banco de México in the foreign-exchange market, international reserves would rise by 22.4 billion dollars.[2]

Taking all of this into account, and in an effort to promote orderly conditions in the foreign exchange market, the Foreign Exchange Commission decided that it was appropriate to sell much of the projected accumulation of international reserves on the market.

Daily dollar auctions have been conducted since March 9, 2009. Originally, 100 million dollars a day were offered in these auctions at no minimum price, and additional 300 million dollars a day with a minimum price two percent higher than the fix exchange rate for the previous day. However, following a change in the projections for the balance of payments, starting in late May this amount has been reduced to 50 million dollars a day at no minimum price and 250 million with a set minimum price.

With these modifications, international reserves are expected to close 2009 at a level similar to that of year-end 2008 (see table).

Balance of Payments 2008 – 2009
(Millions of dollars)

	2008	Projection March 2009	Projection May 2009
Current Account	**-15,725**	**-24,100**	**-18,108**
Trade Balance	-17,261	-26,375	-19,740
Oil Balance	14,381	5,695	8,170
Non-oil Balance	-31,642	-32,070	-27,910
Balance of non-factorial services	-7,079	-4,911	-6,122
Balance of factorial services	-16,846	-15,250	-14,424
Balance of transfers	25,461	55,437	22,178
Capital Account	**24,550**	**27,469**	**20,119**
Liabilities	**33,158**	**20,729**	**18,693**
Indebtedness	7,986	6,229	7,013
Public Sector 1/	-3,928	9,829	10,613
Private Sector 2/	-939	-3,600	-3,600
Pidiregas	12,853	0	0
Foreign Investment	25,172	14,500	11,680
Assets	**-8,608**	**6,740**	**1,426**
Errors and Omissions	**-1,376**	**0**	**-1,583**
Change in net reserve	**7,450**	**3,369**	**428**

1/ Includes Development Banks and Banco de México. In 2009, Pidiregas (Long Term Productive Infrastructure Projects) were included in the public sector debt.
2/ Includes commercial banks.

1. For more information on this flexible credit line, see the press release on the Foreign Exchange Commission announcement dated April 1, 2009.

2. The 4.3 billion dollars already placed by Banco de México as of March should be subtracted from the 22.4 billion.

Lessons to be learned from the impact on financial markets of company losses generated by derivative transactions

The uncertainty generated by the losses of several companies and the resulting increase in risk aversion have raised questions about: i) the risk management policies of some Mexican firms; ii) the complex nature of the financial products and users' partial understanding of the inherent risks; iii) the incentives structure of financial intermediaries; iv) the quality of public information; v) the performance of rating agencies; vi) derivative transaction oversight; and vi) legal documentation of such transactions.

Companies' risk management policies

Most Mexican companies resorted to derivative instruments to adequately hedge their risks. However, given the transaction amounts involved and the size of the losses in which some companies incurred they clearly underestimated the implied risks in derivative transactions.

In a large number of transactions there was also a de-linkage between the financial risk assumed by the companies and those inherent to their core business. In such cases companies acquired the derivatives with the sole purpose of increasing their earnings without taking into account that holding such instruments could impact their balance sheets in certain scenarios. Although the situation was partly due to a prolonged period of macroeconomic stability it could have been avoided if companies had had: i) access to clearer information about the risks involved; ii) better internal controls; and iii) Boards of Directors which were more involved in the oversight of transactions, which because of their nature had the potential to put a substantial part of the business in peril. There is no practical solution to these problems. What could proceed is a review of the corporate governance structures and risk management processes of issuers of securities and capital.

The lack of a proper understanding of the risks on the part of users and intermediary bonus structures

Experience suggests that the intermediaries who offer these financial products should go to greater lengths to provide their clients with complete and transparent information on the nature, characteristics and risks involved in such transactions.[52] However, it is important to bear in mind that financial intermediaries incorporated in Mexico probably have a different bonus structure to those based abroad, especially if the latter are banks specializing in certain financial product lines. The former usually maintain multiple business relationships with companies located in the same country, either through credit granting, treasury management or payrolls, money transfers and payment services. It goes without saying that these companies are interested in ensuring the long-term solvency and financial viability of their clients. On the other hand, financial intermediaries established abroad, especially specialized ones, do not usually carry on such business relationships, and so their objectives are more geared towards maximizing short-term profits. Furthermore, the remuneration structures of many of their executives encourage them to maximize commissions leading them to try to generate profit without taking full account of the risks assumed by both clients and the institutions themselves. This is why they aggressively promote exotic products without placing enough importance on clients' profile and real needs. The current crisis is replete with examples of similar behavior.

The quality of public information

Most of the financial institutions which were counterparties in these derivative transactions were unaware of the size of their corporate clients' global exposure. Some companies had entered into similar transactions with several

[52] Some financial authorities as well as analysts and experts in the field are advocating the implementation of much stricter investor protection rules in over-the-counter (OTC) derivative markets in order to encourage greater transparency with regard to inherent risk specifications in the contracts financial institutions enter into with clients. See: Dodd (2009) *Recent Derivatives Blow-ups in Emerging Markets – What Happened and Why?* Financial Analysis Division IMF and U.S. Department of the Treasury (2009) *Regulatory Reform Over-The-Counter (OTC) Derivatives.*

financial intermediaries such that the overall amounts of their exposure exceeded those they were able to bear without putting their solvency at risk in certain scenarios. This situation points to a lack of due diligence on the part of financial intermediaries which participated in these transactions, as they did not have enough information to properly assess the financial situation of their borrowers. It also placed the spotlight on the need to increase the quality and timeliness of the information debt or equity issuers must provide the market with. Publicly-listed companies must disclose information to the public on a regular basis as well as inform the market about relevant events (Box 15). However, the public information provided failed to specify the potential risks involved. As a result, the National Banking and Securities Commission (CNBV) now requires publicly-listed companies to publish a quarterly report on derivative instruments covering both qualitative and quantitative information as well as a sensitivity analysis under three different scenarios so the general public can more easily identify the market, credit and liquidity risks of companies.

The performance of rating agencies

The huge losses incurred by some companies threw light on conflicts of interest and a lack of diligence on the part of rating agencies in terms of fulfilling their functions. They were apparently unaware of or did not pay enough attention to the risks companies had assumed with derivative transactions despite the responsibility involved in assigning credit ratings.

Oversight of derivative transactions

Financial authorities failed to identify a high concentration of risk among several leading companies. This situation occurred for a number of reasons. On the one hand, financial authorities did not have access to information that would have enabled them to detect the way risk was building up at several private companies because many of the transactions had been entered into with foreign counterparties. On the other, financial intermediaries usually keep large amounts related to derivative positions on their balance sheets. While they represent considerable leverage they usually offset each other. In other words, a short position with one client is usually offset by an equivalent long position with another or with an intermediary. As a result, net derivative exposures are usually marginal. However, while this compensation reduces the market risk, it does not reduce the credit risk (Box 8). Also, the structures tend to be very complex giving rise to non-linear risk exposure behavior.

Table 8
Commercial Bank Derivative Positions
Million Dollars[1]

	Currencies [2]			Interest Rates		
	Forwards [3]	Options	Swaps [3]	Forwards [3]	Options	Swaps [3]
Net position	**-381**	**-255**	**-664**	**-35**	**-2,883**	**348**
Long position	**513**	**11,614**	**622**	**3,931**	**16,768**	**1,361**
Local financial institutions [4]	42	3,409	156			271
Foreign financial institutions	383	5,009	192	161	15,152	639
Local individuals						
Local companies	65	3,196	171		1,616	301
Other local investors	22		104	3,770		93
Foreign companies						
Short position	**894**	**11,869**	**1,237**	**3,966**	**19,651**	**1,013**
Local financial institutions [4]	37	2,301	157			284
Foreign financial institutions	457	7,521	642	156	16,617	359
Local individuals		1			33	
Local companies	159	2,047	372		2,637	232
Other local investors	241		60	3,810	363	133
Foreign companies			5			5

Figures as of September, 2008.
Source: Banco de México.
1/ Local currency-denominated transactions were converted to dollars at the September 30th, 2008 Fix exchange rate.
2/ Includes peso-dollar, peso-currency and currency-currency transactions.
3/ Current transactions given in nominal value.
4/ Includes transactions with other commercial banks, development banks and Brokerage firms.

Aspects the current crisis has shed light on include the underestimation of counterparty or credit risk by financial market participants. The concentration of risk with a single counterparty was not reflected in the balance sheets of financial intermediaries because the net, not the gross, positions of derivatives were registered. Furthermore, monitoring counterparty risk becomes particularly difficult when exposure is through financial instruments that are highly sensitive to variations in the value of the underlying assets, especially when they incorporate optional factors which generate non-linear changes in their value (Box 13).

With a view to solving the issue of risk concentration, the quality and timeliness of the information published by issuers must be improved. The National Banking and Securities Commission (CNBV) has already undertaken several reforms in this regard (Box 15). Likewise, the costs and benefits of increasing regulatory oversight of markets and institutions with the potential to take on systemic importance should be analyzed. It is also necessary to come up with procedures which permit the concentration and diffusion of relevant information in relation to the global risk exposure of counterparties involved in such transactions. One mechanism for mitigating credit risk could be the use of centralized counterparties for some derivative transactions.

Box 15

Information Disclosure by Companies that Issue Securities

Mexican regulations impose a series of obligations on issuers that list their securities in the National Securities Registry, regarding the regular reporting of information and the disclosure of any material information that may influence the price of their debt or equity instruments.

1. Securities Market Act (LMV)
This Act defines the type of information that issuers must regularly present to the CNBV and the Mexican Stock Exchange for immediate dissemination. This includes information regarding the company, its corporate governance, corporate actions and reorganizations, financial statements and risks. The information must be submitted on a quarterly and annual basis, and whenever a material event arises. Issuers are also obliged to disclose through the Stock Exchange, for immediate dissemination and under the terms and conditions established by the LMV, any material events at the time they become known to the company. These reports may only be deferred when they have to do with events that have not yet taken place and on which there is no information in the mass media, or any unusual movements in the price or volume of the company's stock traded on the market.

As a result of a situation that arose in connection with losses by various issuing companies on derivative transactions, and specifically an insufficient amount of information available in the market, a series of changes were made to the Securities Market Act and Financial Information Standards. In May 2009, the Act was modified to oblige companies to also report regularly on their position in derivative financial instruments, underlyings, notional or reference values, conditions of payment, and possible contingencies they represent for the company's financial situation.

2. Financial Information Standards (NIF Bulletin C-10)1
Disclosure rules
According to the standards, firms must supply minimum disclosures in the notes to their financial statements regarding their trading in derivative financial instruments, such as: i) specification of risks, both recognized and not recognized on the balance sheet as assets or liabilities, but which may affect the company's current or future results; ii) the nature of the derivative instruments and the company's purpose for holding them; iii) details of the hedge ratios for each derivative instrument; iv) valuation and risk measurement techniques; v) methods for determining reasonable value; vi) obligations imposed upon the company in connection with the derivative transactions; and vii) the use of implicit derivatives.

This description must be sufficiently explicit with reference to derivative financial instruments not being used for hedging purposes. The company must also supply a description of the valuation and risk measurement techniques used, such as Value at Risk, duration, analysis of sensitivity scenarios, etc., and if the company does not have systems or staff that track the risk on those instruments, it must disclose the mechanisms or policies that mitigate those risks.

Furthermore, firms must disclose the following quantitative information: i) notional amount; ii) amount and type of collateral or guarantees; iii) structure of derivative portfolio for trading purposes; iv) value of exposure to credit and market risks; v) amount of reasonable value; and vi) amount of losses entered in the results of the period stemming from depletion of a financial asset.

Valuation of derivatives
According to current accounting criteria, the assets or liabilities resulting from the rights and obligations established in derivative financial instruments must be recognized at reasonable value. "Reasonable value" is defined as the amount for which a financial asset can be exchanged, or a financial liability settled, between parties who are interested in and inclined to do so, in a fair-market transaction. The results of the valuation of assets and liabilities stemming from the rights and obligations involved in derivative financial instruments must be recognized in the results of the period. Derivatives must be entered on the balance sheet as either assets or liabilities. The assets or liabilities with which they are associated must not be presented in net terms, in order to avoid altering the substance and presentation of each.

3. Unified Issuer Bulletin
This Bulletin established more precisely and in greater detail the requirements, terms and conditions that must be met by regular information as well as disclosure of material events that issuers submit to the Mexican Stock Exchange, and which by nature has the capacity to influence the price of the companies' securities. It also specifies the guidelines and the documents or reports in which the necessary information must be presented, such as the annual report and information prospectuses.

4. Control bodies, board of Directors, external auditors and risk rating agencies.
The LMV stipulates that the oversight of management, guidance and execution of a company's business is the responsibility of its board of directors, through the committees it creates for the purpose of pursuing corporate practices and conducting internal audits, as well as the firm entrusted with the company's external auditing. Risk Rating Agencies are responsible for issuing independent technical opinions of the creditworthiness of an issuer or a security. Their opinions must be based on quantitative and qualitative analysis of the issuer's financial statements and must include aspects such as operating management, quality and independence of management, strategy ad controls, market position, quality and origin of collateral or guarantees, payment application priority, macroeconomic climate, and quality and integrity of the information, among other factors. According to the LMV, the Board of Directors must keep track of the principal risks to which the company and other corporations that it controls are exposed, identified based on the information presented by its committees, the Chief Executive Officer and the external auditors.

_____

1. Mexican Public Accountancy Institute. Bulletin C-10: Derivative Financial Instruments and Hedge Transactions. Financial Information Standards (NIF), 2006

Legal documentation of OTC derivative transactions

Another risk in terms of the events analyzed was that many of these transactions had been entered into without observing the necessary legal safeguards, which also compounded the risk for counterparties. The lack of legal documentation can make it extremely difficult for parties to settle differences, especially when they come under different jurisdiction. Uncertainty about the rules governing non-regulated transactions, which given their nature are not broadly applicable, constitutes an important factor in risk management.

4.2. Debt market

Debt markets in Mexico were not immune to the general climate of distrust and risk aversion in the world's main economies. An increase in the cost of money negatively impacted Mexican companies' financing sources prompting a restructuring of private investor portfolios in favor of safer assets. This situation triggered significant sales of long-term securities, including Federal Government bonds. Likewise, there was a clear preference for liquid assets, mainly by institutional investors which faced losses and significant fund withdrawals. Further, markets' illiquidity implied that prices for some securities could not be determined.

As of the publication date of this report, conditions prevailing in debt markets prior to the crisis had not yet been restored. However, the market development achieved during the years preceding the crisis has provided a series of clear advantages. First, the Federal Government managed to place debt in the domestic market even during the height of the crisis, with only marginal variations in amounts and maturities. This enabled the government to finance its funding requirements thus ensuring the availability of benchmark interest rates for peso-denominated debt at all times. Secondly, the development of the domestic market in recent years was used by local issuers to recompose the denomination of its debt between domestic currency and foreign exchange. The development achieved by the derivatives markets also in the years prior to the current crisis, has enabled many firms and financial intermediaries to mitigate e the impact of interest rate and exchange rate movements as well as to spread the risk among different participants.

Main issuers

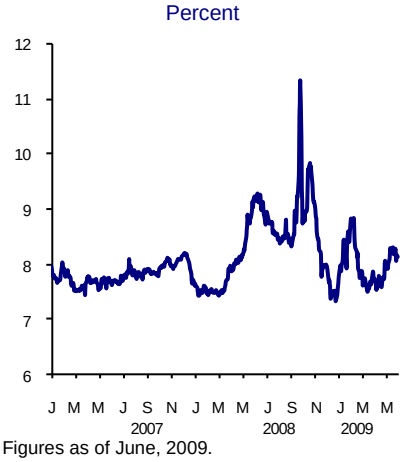
Federal Government and Bank Deposit Insurance Institute (Instituto para la Protección del Ahorro Bancario, IPAB)

Uncertainty prevailing in international markets, foreign exchange market volatility and preference for liquidity caused some investors to considerably reduce their long-term debt positions, Federal Government bonds included. This lower demand for long-term securities was reflected in an increase in the risk premium of such securities and adversely impacted the liquidity in the secondary market (Graph 36).

In response to the falloff in demand for longer-term instruments, the Federal Government lowered the amount of its long-term debt placements.[53] However, it was able to replace the decrease in the amount placed in the domestic markets with external financing, taking advantage of the efforts made in previous years to improve the profile of its external debt. To address the pressures in the long-term debt market a series of measures were adopted. These included a Federal Government Bonos M and Udibonos repurchase in the secondary market and a swap of a ten-year fixed interest rate in exchange for a floating rate carried about by Banco de México with financial institutions.

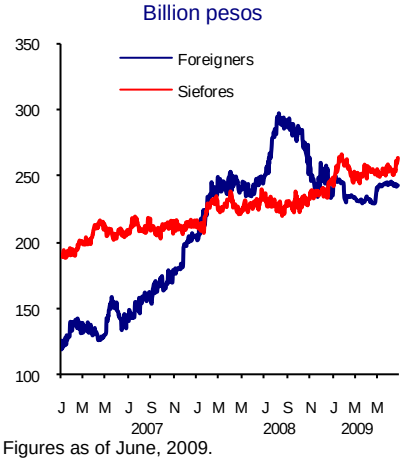
Graph 36
Federal Government Bonds

a) 10Y Bono M Yield



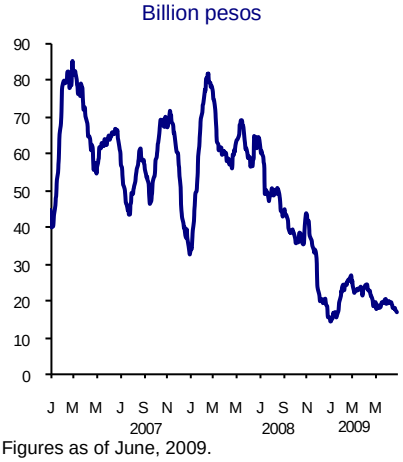
Figures as of June, 2009.
Source: Proveedor Integral de Precios (PIP).

b) Holdings of Bonos M by Foreign Investors and Siefores



Figures as of June, 2009.
Source: Banco de México.

c) 10Y Bonos M Turnover



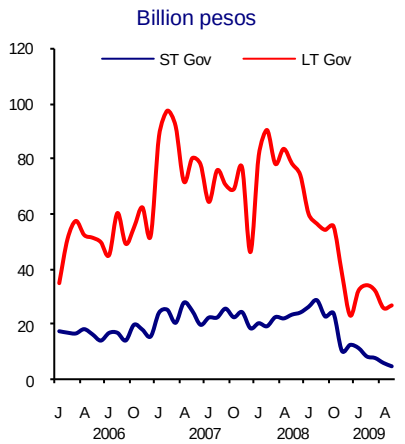
Figures as of June, 2009.
Source: Banco de México.

The IPAB also experienced a drop in demand for its securities as well as an increase in the cost of financing. Diminished appetite among institutional investors for these securities could be explained by a preference for liquidity after some clients' decision to exit mutual funds. Like the Federal Government, the IPAB responded to these events by reducing the amount of placement amounts and the term of its different instruments. Meanwhile, Banco de México purchased 150 billion pesos worth of IPAB debt (BPAs) in the secondary market in order to restore the liquidity of these securities.

[53] This section includes a table at the end summarizing the main measures taken by the Mexican financial authorities to mitigate the impact of the financial crisis on the debt market.

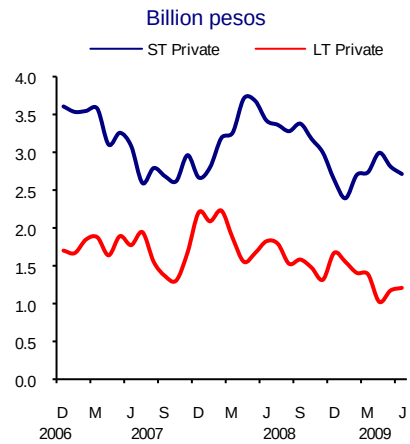
Graph 37
Daily Average Volume Traded

a) Government Debt Spot Market



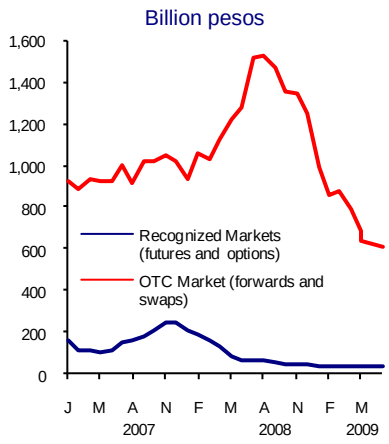
Figures as of June, 2009.
Source: Banco de México.

b) Private Debt Spot Market



Figures as of June, 2009.
Source: Banco de México.

c) Derivatives Market



Figures as of June, 2009.
Source: Banco de México.

Private issuers

Risk aversion in financial markets worsened following the announcement that several leading companies had incurred significant losses on transactions involving foreign exchange derivatives. This situation led to a considerable increase in the aversion to invest in private debt. Furthermore, investor preference for liquidity led to an increase in short-term debt issuances to the detriment of issuances with longer maturities. This substantially increased the refinancing risk of the liabilities. The deterioration in the credit rating of several companies also contributed to this negative scenario.

One area particularly hit by greater risk aversion was the mortgage. Delinquency rates of the mortgage portfolio of several non-bank financial institutions (Sofoles) along with credit rating downgrades for financial insurance companies backing Borhis[54], had a negative impact on both Sofol security issuances and the mortgage securitization market.

In October, several commercial paper auctions were unsuccessful.[55] At the same time, as of October 2008 the cost of money increased with the rising between 200 and 600 basis points of the spread between interest rates and the 28d TIIE (Graph 38a). The intensification of risk aversion among investors in the short-term debt market increased the gap between the costs of financing for higher-rated issuers with respect to lower-rated issuers (Graph 38b). Guaranties offered by Nafin-Bancomext and Sociedad Hipotecaria Federal have enabled some companies to continue obtaining funds in this market, albeit at higher interest rates than those seen in early 2008. (Graph 38c).

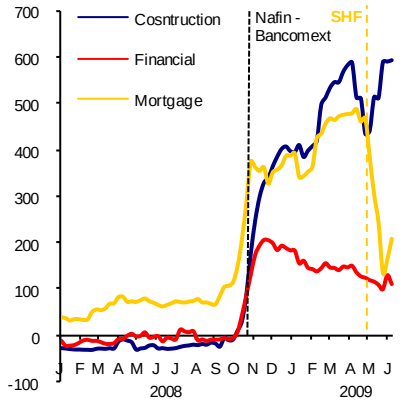
[54] Mortgage-backed bonds.

[55] Unsuccessful auctions accounted for 15.4 percent of the amount placed in the month.

Graph 38
Short-Term Corporate Paper

a) Spread Between Interest Rates and the 28d TIIE of Commercial Paper Issues

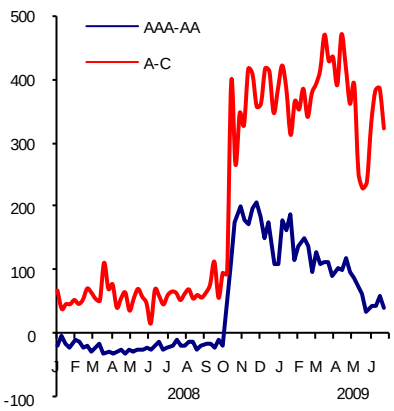
Basis Points



Figures as of June 2009.
Source: Banco de México.

a) Spread Between Interest Rates and the 28d TIIE of Commercial Paper Issues

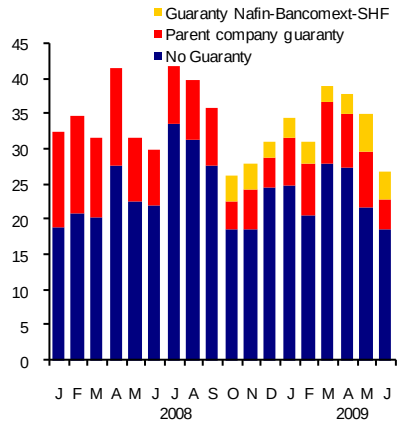
Basis Points



Figures as of June 2009.
Source: Banco de México.

c) Monthly Placement of Commercial Paper By Type of Guaranty

Billion pesos



Figures as of June 2009.
Source: Banco de México.

The adjustment in the long-term private debt market was more severe. In recent years this market had gradually grown, offering Mexican companies an alternative source of financing that was generally cheaper than bank credit. The crisis of confidence virtually closed the access to this market for some time, issuances of corporate paper with more than 1-year maturity dropped by 87 percent year on year in the last quarter of 2008. Some companies that had become the global benchmark for Mexican corporate debt faced industry-specific problems that affected their borrowing capacity.

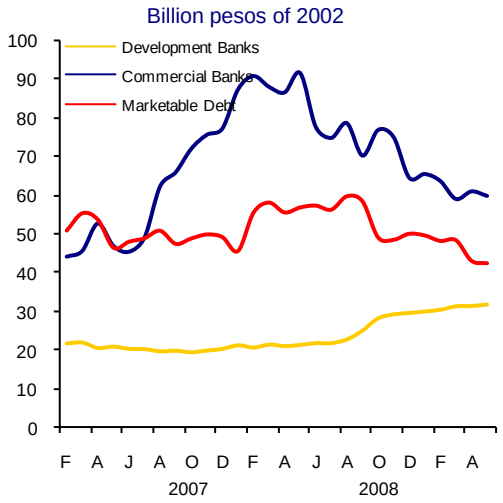
During the first half of 2009 there was a smallimprovement in these markets. However, the debt placements' backlog continues with issuancesamounting to only 48 percent of the amount issued in the same period the previous year. Although private sector debt refinancing is still very limited in this market, the corporate debt maturity profile is relatively loose. The ability of issuers in recent years to place long-term debt contributed to reduce the concentration of maturities.

Given the difficulties faced by short-term paper issuers in renewing bank credits and security placements[56], the development banks have stepped in to meet the corporate credit shortfall (Graph 39a). From September 2008 onwards, companies started to obtain this type of financing on better terms than with commercial banks. (Graph 39b).

[56] The analysis shown takes into account companies which issued short-term commercial paper during 2008.

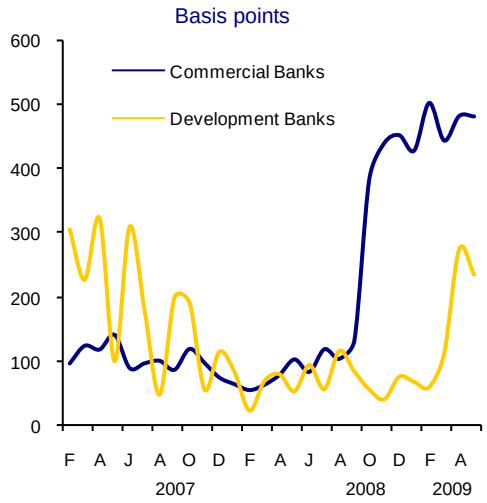
Graph 39
Marketable Debt and Bank Financing Trend

a) Financing to Marketable Debt Issuers



Figures as of May, 2009.
Source: Banco de México.

b) Spread Between Interest Rates on Loans Granted and the 28d TIIE



Figures as of May, 2009.
Source: CNBV and Banco de México.

From the fourth quarter of 2008, construction, auto and mortgage sector companies had difficulties renewing their marketable paper placements (Graph 40a). Furthermore, the historical trend in which financing conditions were better in the debt market than those in the banking sector was reversed for the construction and mortgage sectors in late 2008 (Graph 40b). Development banks have played an increasingly greater role in financing these sectors (Graph 40c).

Institutional investors

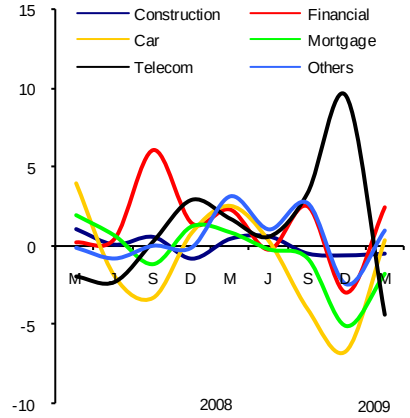
The deterioration in equity and debt markets generated significant losses in the value of portfolios managed by institutional investors (Graph 41a). In mutual funds, this situation resulted in the exiting of some clients and the restructuring of investment portfolios (Graph 41b). For funds with longer investment horizons, portfolio restructuring was less significant. However, there was a preference for less risky assets.

The major outputs of clients were in equity funds and funds with a high exposure to corporate debt. Mutual funds adopted a series of measures to meet these withdrawals and at the same time protect the resources of savers who chose to remain invested. Some mutual funds, especially those with funds invested in riskier assets applied write-downs or penalties to the withdrawal of funds. Furthermore, Mutual Fund managers built liquidity reserves to meet potential withdrawals. In order to lessen the impact of these transactions on markets, the CNBV allowed mutual funds to temporarily undertake trading of securities with financial institutions belonging to the same financial group.

Graph 40
Marketable Debt and Bank Financing by Sector

a) Difference Between Securities' Placement Amounts and Amount of Expiring Securities in the Short-term Securities Market

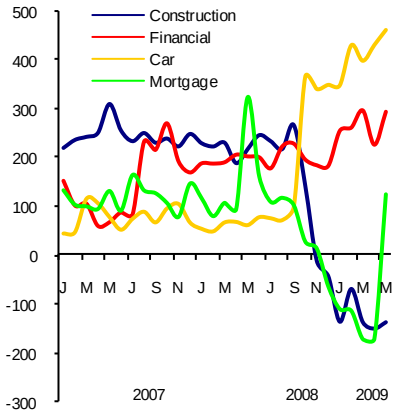
Billion pesos



Figures as of June, 2009.
Source: Banco de México.

b) Spread Between Interest Rates on Bank Credits and Stock Certificates

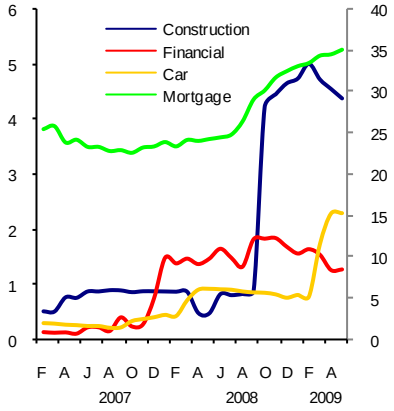
Basis points



Figures as of May, 2009.
Source: Banco de México.

c) Amount of Credit Granted by Development Banks

Billion pesos
Mortgage (right axis)
Other sectors (left axis)

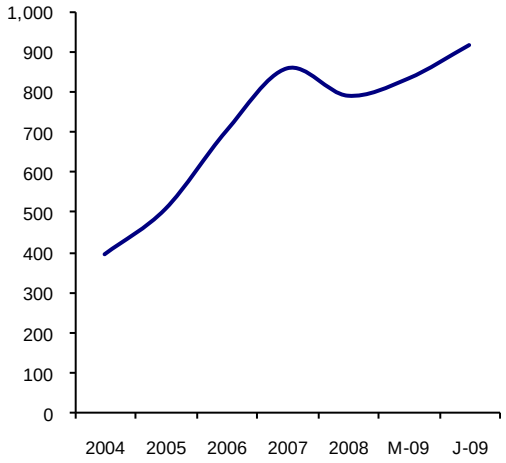


Figures as of May, 2009.
Source: Banco de México.

Graph 41
Mutual Funds

a) Net Assets

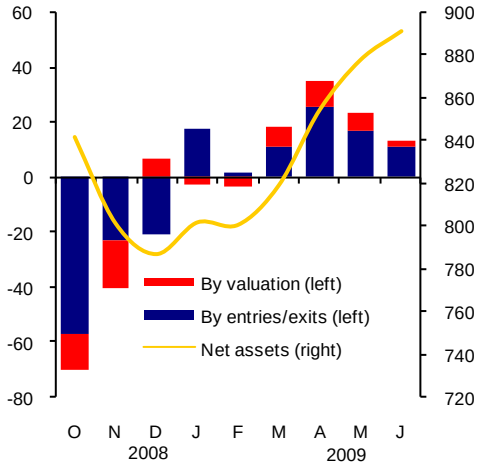
Billion pesos



Figures as of June, 2009.
Source: AMIB.

b) Change in Net Assets

Billion pesos



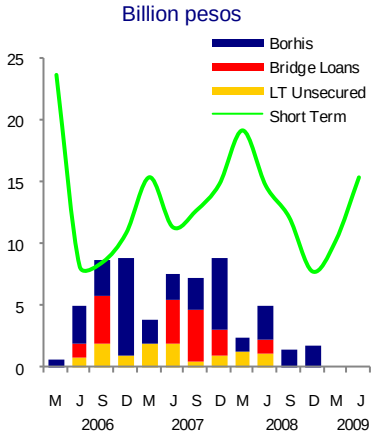
Figures as of June, 2009.
Source: AMIB.

Limited and Multi-Purpose Non-Bank Banks (Sofoles and Sofomes)

The crisis has negatively impacted Mortgage Sofoles and Sofomes in two different ways. On the one hand, an increase in risk aversion and deterioration in mortgage vintages made tapping capital markets for funds more expensive. Furthermore, Sofoles must retain originated loans on their balance sheets as the securitization market has virtually disappeared due to a lack of liquidity and increasing risk aversion (Graph 42a). In addition, defaults on securities issued by the Sofoles Metrofinanciera and Crédito y Casa in April 2009 further increased borrowing costs for Sofomes and reduced the maturities of new issuances (Graph 42b and c).

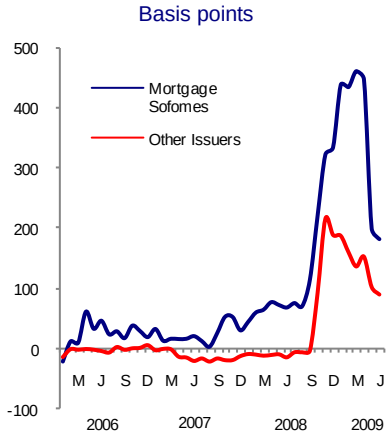
Graph 42
Marketable Paper of Mortgage Sofomes

a) Quarterly Placements of Mortgage Sofomes' Marketable Debt



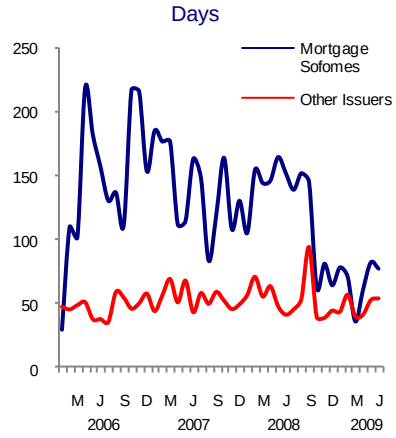
Figures as of June, 2009.
Source: Banco de México.

b) Spread Between Interest Rates and the 28d TIIE on Short-Term Debt Issues



Figures as of June, 2009.
Source: Banco de México.

c) Term of Short-Term Debt Issues



Figures as of June, 2009.
Source: Banco de México.

In order to mitigate the negative effects that news of the afore mentioned defaults would have on investors as well as to ensure liquidity and flow of funds in the Mexican mortgage market, in May 2009 both the authorities and private associations[57] signed an agreement to enable the Federal Mortgage Company (SHF) to guarantee 65 percent of the issuance amount maturing between 2009 and 2012. This agreement has enabled companies to refinance their short-term debt under more favorable market conditions and increased the debt placement maturity of these intermediaries (Graphs 42 b and c). Sofomes that are eligible for this guarantee are characterized by a healthy financial situation. Box 16 shows the trend in the mortgage portfolios backing Borhis issues.

[57] SHCP, SHF, ABM and AMFE are signatories to this agreement.

Box 16

Mortgage Portfolios that Back Borhi Issues

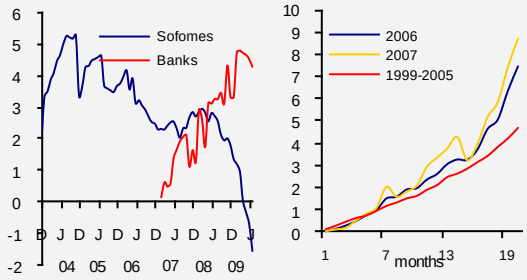
Borhi is the Mexican acronym for residential mortgage backed securities. Borhis are obliged to meet certain information disclosure requirements, and the mortgages backing them must meet certain characteristics established by the Federal Mortgage Company (Sociedad Hipotecaria Federal, SHF). Borhis were created in 2004 as an attractive funding option for financial firms specializing in residential mortgages, because they allow for an adjustment of the terms of assets and liabilities, reduce refinancing risk and in some cases generate a benefit in terms of capital and funding cost.

In a mortgage securitization, the mortgage agency sells the credit rights on a set of mortgages to an investment vehicle or trust, and the trust administrator places the debt instruments on the market, with terms similar to those of the assets placed in trust. Thus the mortgage agency obtains fresh funds to finance more mortgages, the credit manager (generally the mortgage agency) continues to manage the portfolio, and the trustee ensures the inflow and outflow of funds, as the sole party responsible for managing the securitized mortgages. This is important, because even though two mortgage Sofomes defaulted in April 2009, payment of interest and capital on their Borhi issues was unaffected.[1,2] The credit quality of the issue depends on the characteristics of the assets placed in trust, such as: the geographic diversification of the mortgages, the vintage (year of origin), the value of the loan compared to the value of the property (loan to value or LTV ratio), the monthly mortgage payment as a percentage of the borrower's income (debt to income, or DTI), among others. An issue can also include credit enhancements that improve its risk profile, such as:

- Financial guarantees. A financial entity may guarantee the payment of interest and principal on an issue in exchange for a premium. A 100 percent guarantee is known as a full wrap.
- The division of the issue into tranches with different orders of priority of interest, principal, and credit rating, which enables the issue to be adapted to different investor risk profiles.
- The overcollateralization indicates the amount of excess equity on the issue available to cover the losses caused by loan defaults on the assets placed in trust. It is equivalent to the positive spread between the rate on the mortgage loans and the rate on the securities issued.

Sofomes began to actively place Borhis in 2004, while banks began their Borhis activities in 2006. Considerable volatility in the markets since October 2008 has diminished their appeal with investors, because since they are long-term issues at fixed or real rates, their prices are very sensitive to changes in interest rates. Recently, overcollateralization levels on issues by mortgage Sofomes were substantially reduced, averaging negative levels, although this was not the case for all issues. The 2006 mortgage vintage, and to a lesser extent 2007, present much higher past-due loan rates than those of preceding years (see graph 1).

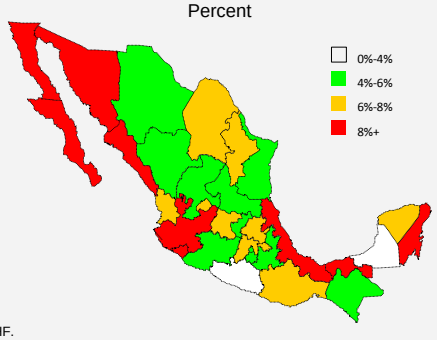
Graph 1
Overcollateralization and Delinquency Rates by Mortgage Vintage (Sofomes)
Percent



Source: SHF.

Northwestern states and some southeastern states display higher delinquency levels compared to the rest of the country (Graph 2), so issues with strong concentrations in such states could face high delinquency levels.

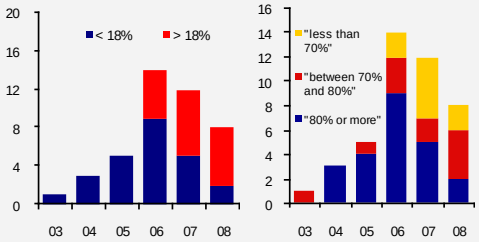
Graph 2
Delinquency Rates by State, May 2009
Percent



Source: SHF.

In 2006, placements of Borhis with DTI ratios of more than 18 percent began to increase, implying a greater risk associated with issues backed by this type of mortgage. In 2006, a substantial number of mortgages were also securitized with high LTV levels (meaning low down payments), thus increasing the default probability of these issues (see graph 3).

Graph 3
DTI (left) and LTV (right) by Vintage Year
Billions of pesos



Source: SHF.

In sum, the inclusion of credit enhancements in structured instruments has allowed them to continue honoring their obligations despite a difficult economic climate, because they have been able to assume the losses generated by the depletion of the securitized assets.[3]

It is important to note, however, that the financial weakness of the issues is not a generalized phenomenon, and is concentrated primarily in issues of two mortgage Sofomes with a heavy concentration of mortgages originated in states of northwest Mexico where delinquency rates are high, and also originated in 2006 and 2007, vintages where it is clear that the credit quality of the mortgages was much lower than in other years because they were generated at very high DTI ratios and low down payments.[4]

---

1. See Section 4.4 of the 2007 Financial System Report.
2. Metrofinanciera and Crédito y Casa defaulted on their debt obligations on April 23 and 29, respectively.
3. For example, an average of 38.4 percent of Borhis had insurance coverage from a GPO (see Table 6 of the Financial System Report for 2007).
4. The relationship between the down payment and the LTV is as follows: down payment = 1 - LTV.

4.3. The development of financial markets

The current financial crisis has thrown light on the strengths and weaknesses of financial markets in Mexico. On the one hand, the benefits of efforts made over the last decade to boost the development of foreign exchange and debt markets have become evident. As already mentioned, this development has enabled the country to confront the current crisis from a position of greater strength. In particular, lower external indebtedness and a floating exchange rate regime have prevented the accumulation of current account imbalances from fueling runs on the peso and sudden increases in interest rates, situations which have been present in each of the financial crises Mexico has experienced over the past decades. Moreover, the development of the derivatives market, in particular futures, forwards and swaps, have allowed market participants to have a range of instruments and liquidity to manage their risk better than in the past. However, there are still some weaknesses in the Mexican financial markets that must be addressed in the coming years. This section deals with two of them: the lack of equilibrium prices in some debt markets and opportunities to make more efficient use of derivatives instruments.

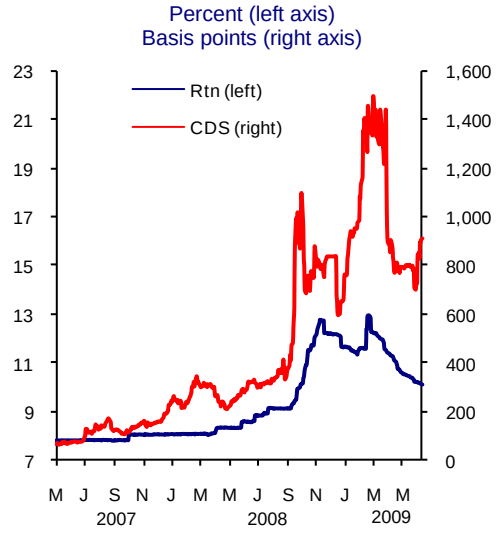
A situation which initially characterized the current crisis was the almost total dried up of liquidity in the markets for some debt instruments (Graph 43a). Lower liquidity in such markets is understandable under scenarios of increased risk aversion. However, this situation was aggravated by the low sensitivity of the prices of some assets, mainly the long-term private debt securities (Graph 43b). For example, the deterioration in the credit quality of some issuers was more dynamic in the prices of their credit derivative than in the prices of their debt. In the absence of markets to set equilibrium prices, the valuation was based on isolated transactions or theoretical models. However, the lag showed by these assets in adjusting to new market conditions dampened the interest of potential buyers, which further reduced the liquidity and made it even more difficult to set the price of these assets. The way in which instruments are valued is something that all market participants should analyze, from intermediaries and price appraisers to the authorities themselves.

Given the drop in confidence and rising counterparty risk caused by the insolvency of major players in OTC markets, such as AIG and Lehman Brothers, the relative safety of exchanges organized with a clearing house allowed the trading volume and participation in these exchanges were relatively stable compared with the severe downturn in OTC market activity.

Lower risk tolerance among traders and banks alike triggered a reduction in the overall use of instruments as well as derivative transactions, especially globally. Nevertheless, in the case of the MexDer (Box 17) 10 year bond future transactions increased helped offset the fall in other contracts (Graph 44b).

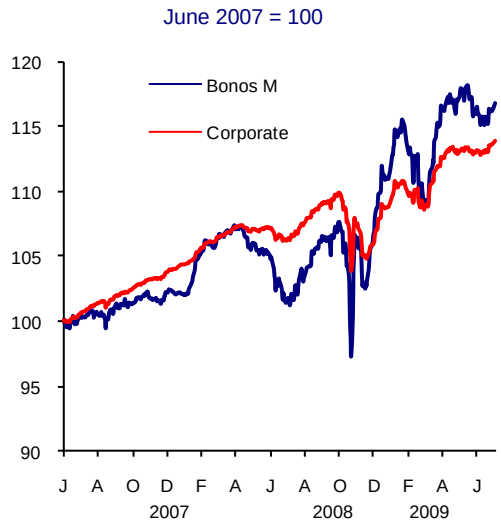
Graph 43
Asset Valuation

a) Credit Risk of 5-year Cemex Debt in Pesos



Figures as of June, 2009.
Source: Valmer and Bloomberg.

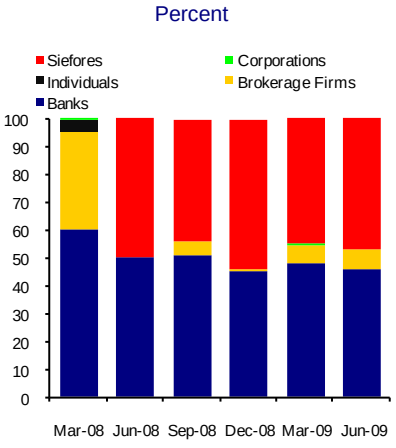
b) Corporate and Government Debt Indices



Figures as of June, 2009.
Source: Valmer.

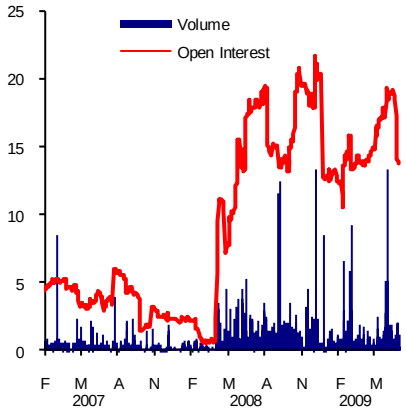
Graph 44
MexDer

a) Sectorization of 10-Year Bond Future Contracts



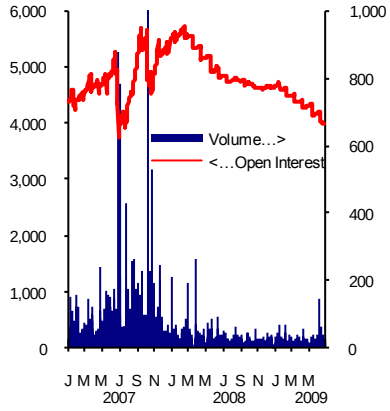
Figures as of June, 2009.
Source: MexDer.

b) 10-Year Bond Futures



Figures as of June, 2009.
Source: MexDer.

c) TIIE Futures Traded in The MexDer



Figures as of June, 2009.
Source: MexDer.

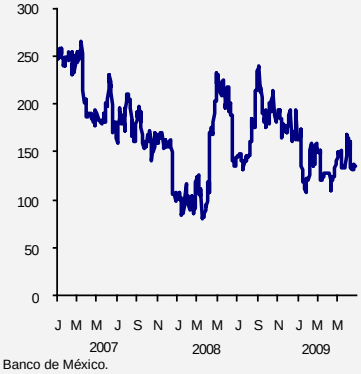
Box 17

MexDer and Asigna

During the most critical months of the current global financial crisis, the Mexican Derivatives Exchange (MexDer) remained an important supplier of liquidity and permitted proper price formation to continue in the Mexican financial markets. Following the breakup of the U.S. investment bank Lehman Brothers, risk aversion spread across financial markets. At that point, the standardized markets became a preferred refuge for investors. The availability of mechanisms like margins, daily valuation and clearinghouses with rock-solid capital structures was tremendously helpful during the moments of most intense uncertainty. In Mexico, the clearinghouse for MexDer, called Asigna, kept up a robust capital structure and even strengthened it, making intraday margin calls on 28 occasions during 2008.

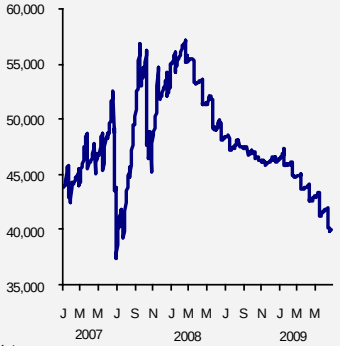
But despite the commendable performance of MexDer, the global crisis and resulting reduction in risk positions among investors meant fewer participants and open positions and lower trading volume (see graphs and 2). Even so, trading activity on MexDer has been more sustained than on the over-the-counter (OTC) market.

Graph 1
Open Dollar Future Contracts
Thousands of contracts



Source: Banco de México.

Graph 2
Open TIIE28 Future Contracts
Thousands of contracts



Source: Banco de México.

The daily valuation of the total positions of each investor and the assets submitted as margins, along with the clearing process, permit the exchange to easily determine the total exposure per client. At the same time, daily margin calls significantly limit the risk of default. Asigna also reduces the counterparty and trading risk by supervising the concentration of open positions, the contract settlement and expiration process, and monitoring the sufficiency of resources and liquidity among its trading members. Finally, in keeping with its function as counterparty to all trades carried out on MexDer, Asigna has agreed on a set of resources and procedures for dealing with any default and/or breakdown of one or more of its participants. These resources are part of what is called a Financial Safety Net, and encompass excess minimum contributions, minimum contributions, the clearing fund, the equity of clearing members, and ultimately, the equity of the clearinghouse itself.

The standardized markets can expect to benefit from this financial crisis. This is because many of the financial problems that arose can be attributed to a lack of measures that have traditionally been the standard in these markets. For some very recently-created products like Credit Default Swaps (CDS), regulators have begun to consider trading schemes similar to clearinghouses.

5. Commercial Banks

Despite the adverse international environment and a much slower pace in economic growth, the Mexican banking sector continued to generate profits in 2008 and during the first quarter of 2009. However, provisioning and lower growth rates of credit to the private sector mostly explain the decrease in sector earnings with respect to those in 2006 and 2007.

The liquidity problems which beset the interbank markets of the world's main developed economies were not initially manifested in the local market. However, as of September 2008, the cost of money in the Mexican interbank market significantly rose while loan maturities became shorter. However, to date commercial banks have had no problem obtaining funding in this market. In anticipation of banks facing greater liquidity problems in the interbank market, Banco de México put in place a new liquidity facility. The current crisis has exposed vulnerability of bank business models that are based on wholesale market funding. This calls for a reassessment of these models in the light of recent circumstances.

Overall Mexican banks are well capitalized and have enough loan-loss reserves to deal with a rise in default rates, especially in the consumer loan portfolio. However, due to the slowdown in the rate of domestic economic growth, a higher cost of funding in international financial markets and deterioration in the credit portfolio, banking sector earnings should tend to decrease.

The first part of this section describes the structure of the commercial banking sector while the second presents profitability, net interest income, trading and fees and commissions indicators. The third section looks at bank solvency indicators. Finally, the fourth section examines credit, market, contagion and liquidity risks[1].

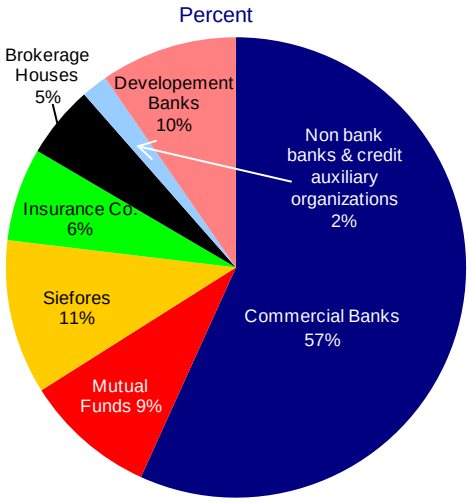
[1] Four groups of banks have been defined for the purpose of this analysis: large, medium-sized and small banks, banks associated with commercial chains (BACC) and small subsidiaries of foreign banks (SSFB). The section does not include information on groups of banks with no relevant share in the topic under analysis or when the information provided is not in the public domain or enables a particular bank to be identified.

5.1. Structure

Commercial banks are still the largest intermediary of the Mexican financial system (Graph 45a). At the end of the first half of 2009, 42 commercial banks had operating licenses. By April 2009, these institutions managed 57 percent of the financial sector's assets. At the same date the six largest managed 82 percent of the banking system's total assets,[2,3] 17 medium-sized and small banks 11.7 percent, and banks associated with commercial chains (BACC) 1.3 percent. [4,5] Finally, small subsidiaries of foreign banks (SSFB) managed 5.0 percent of the sector's assets (Graph 45b).[6]

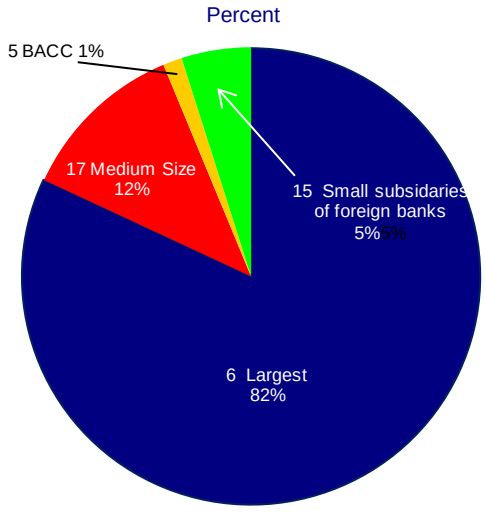
Graph 45
Structure of the Financial System

a) Financial System Assets/



Figures as of April, 2009.
Source: Banco de México.

b) Commercial Banks' Assets1/



Figures as of April, 2009.
Source: Banco de México.

1/ Assets considered include net positions on securities financed through repos. They do not include public trust funds.

[2] The group of six largest banks includes BBVA Bancomer, Banco Mercantil del Norte, Banco Nacional de México, Banco Santander, HSBC and Scotiabank Inverlat. BBVA Bancomer figures include BBVA Servicios. During 2008 Banco Inbursa's assets surpassd Scotiabank's and ING Bank's reached a similar size, and so both groups theoretically belong to the group of six. However, due to their characteristics, this Report includes Inbursa in the medium-sized group and ING Bank in SSFB.

[3] Assets considered include securities financed through repurchase agreement operations. Figures for Banco Nacional de México, Banco Santander and Ixe Banco consolidate those of their Sofomes, since they belong to a financial group with a bank and are subject to banking regulations.

[4] Medium-sized banks are: Banca Afirme, Banca Mifel, Banco del Bajío, Banco Inbursa, Banco Interacciones, Banco Invex, Banco Regional de Monterrey, Banco Ve por Más, Bansi, Ixe Banco, Banco Compartamos, Banco Monex, Banco Autofin, Banco Amigo, Banco Regional, Banco Multiva and Consultoría Internacional Banco.

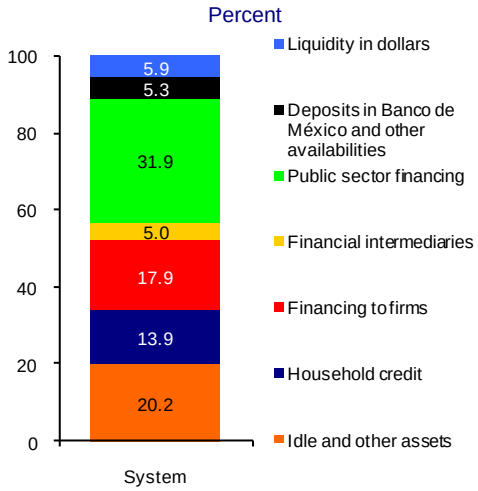
[5] Banks associated with commercial chains are: Banco Azteca, Banco del Ahorro Famsa, Banco Fácil, Bancoppel and Banco Wal-Mart Adelante.

[6] Small subsidiaries of foreign banks: Royal Bank of Scotland, American Express Bank, Banco Credit Suisse, Banco J.P. Morgan, Bank of America, Bank of Tokyo-Mitsubishi, Deutsche Bank, ING Bank, Barclays Bank, Prudential Bank, UBS Bank, New York Mellon and Volkswagen Bank. In 2008 the spin-off of GE Money Bank was authorized and as of April 2009 the bank's assets were transferred to GE Sofom, E.N.R. This Report includes GE Money figures through March, 2009.

Graph 46 shows the asset, liability and capital structure of the banking system.

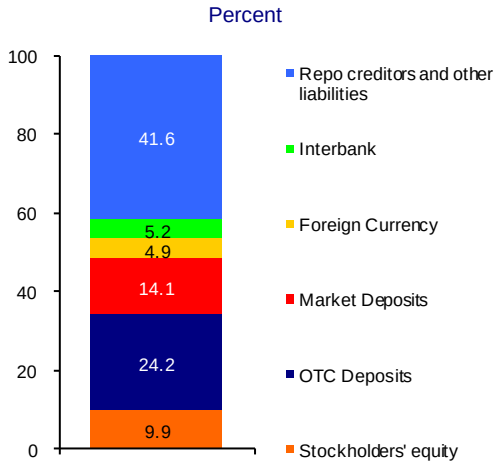
Graph 46
Structure of Commercial Bank Assets, Liabilities and Capital[1/, 2/]

a) Assets



Figures as of April, 2009.
Source: CNBV and Banco de México.

b) Liabilities and Capital



Figures as of April, 2009.
Source: CNBV and Banco de México.

1/ Assets and total liabilities include net positions on securities financed through repos.
2/ Changes to accounting criteria implemented by the National Banking and Securities Commission, CNBV, affected the amount and composition of commercial banks' Total Assets. For that reason the percentages which appear in this graph are not comparable with those which appear in the equivalent graph in the 2007 Financial System Report.

In recent years two changes have taken place with implications for the balance sheet structures of a number of banks: one is corporate in nature and the other regulatory. The first consisted of taking the credit card portfolio off banks' balance sheets by creating the Sofome (multi-purpose non-bank bank) concept. Sofomes obtain funding to operate from the bank they belong to,[7] a corporate arrangement which enables the bank to record the results of the credit card business using a vehicle other than the bank itself (although it must consolidate its financial statements) thus benefitting from a different tax treatment to the one governing credit reserves.[8] The risks banks that created a Sofome such as the ones mentioned in this paragraph are exposed to, are consolidated in accordance with the corresponding accounting criteria (Box 18). The second regulatory reform concerns accounting criteria applicable to repo transactions (Box 19).

[7] The Credit Institutions Law (Ley de Instituciones de Crédito) exempts financial entities belonging to the same financial group from limits on transactions related to bank financing. It is worth mentioning that Sofomes which are part of a financial group with a bank are subject to the same regulations as the bank in order to prevent regulatory arbitrage.

[8] For tax purposes banks may deduct reserve creation equivalent to 2.5 percent of the credit portfolio. Sofome are not subject to this cap.

Box 18

New Accounting Criteria
Consolidation of Special Purpose Entities and
Recognition and Derecognition of Financial Assets

Ideally, the accounting records of a bank should recognize the risks to which it is exposed through investment in Special Purpose Entities (SPE). Accordingly, a new accounting rule took effect in Mexico in 2009 dealing with the accounting treatment of these vehicles, in keeping with International Accounting Standards.

Criterion C-5: Consolidation of Special Purpose Entities[1]

An SPE is any structure used to conduct activities, pay off liabilities or maintain assets, the decisions on which, including distribution of remainders, are not based on voting rights but rather based on the equity the bank owns in its capital. SPEs can be corporations, associations, limited corporations, trusts, and securitization vehicles.

A credit institution or bank must consolidate an SPV when the economic substance of its relationship indicates that the SPV is controlled by the bank. This control may be acquired independently of the percentage the bank owns in the equity of the SPV.

The following are some examples of types of "control":

a) The activities of the SPE are conducted substantially in accordance with the needs of the bank, so it benefits from the operation of the SPE.
b) The equity of the SPE is not sufficient to finance all of its activities, and it depends on the bank to contribute funding or absorb part or all of its debts.
c) The bank essentially has the direct or indirect capacity to make decisions about the activities of the SPE, obtaining benefits or other advantages from its activities.
d) The bank substantially assumes a greater share of the inherent risks (even losses) from its stake in the SPE, or has the right to obtain the majority of the benefits (even profits) generated by the SPE.
e) The bank substantially retains a greater share of the benefits from interest or ownership risks on the SPV or its assets, in order to obtain benefits from its activities.

Even if a bank does not control the SPE, it must be consolidated into its balance sheet if the bank has: i) the unilateral capacity to liquidate the SPE; ii) the unilateral capacity to re-acquire specific financial assets it had transferred previously,[2] or iii) the power to modify the SPE so that it ceases to meet the conditions for non-consolidation.

If the assigning entity does not retain control of an SPE but has significant influence[3] or joint control,[4] it must recognize and record a value for its participation in accordance with the method established for this purpose.

Additionally, to further specify the accounting procedure for determining whether or not there is a transfer of risks and benefits in a transaction, another Criterion was issued:

C-1 Recognition and Derecognition of financial assets[1]

This criterion provides guidelines to determine whether a credit institution should or should not derecognize assets from its balance sheet based on the transfer or lack of transfer of risks and benefits. The criterion is particularly important in dealing with repo transactions, portfolio sales and subordinated securities like certificates. In all of these cases, there may be a total or partial transfer of risk, and therefore the bank must derecognize it from the balance sheet based on the proportion of risks or rights on the asset that are transferred or retained, as the case may be.

For a financial asset to be derecognize from a balance sheet, there must be a transfer of the risks and benefit inherent in that asset. If the institution does not transfer or retain any risks or benefits inherent in the financial asset, it must assess whether or not it actually retains control of the assets. If the entity retains the risks and benefits or, when applicable, control of the financial asset, it must remain on the balance sheet.

If a bank retains the contractual rights but assumes the obligation to pay cash flows to a third party, it may consider this as a transfer, provided that:

i) The bank maintains the obligation to pay cash flows to a third party only when those flows come from the financial asset.
ii) The bank cannot sell or place a lien on the financial asset, unless it is for the purpose of guaranteeing the cash flows committed to a third party.
iii) The bank must deliver the cash flows it collects in representation of a third party and is not permitted to invest the corresponding amount.

Finally, if the financial asset remains on the bank's balance sheet, those assets and liabilities cannot be netted (cleared) against each other. Similarly, the bank may not net the revenues generated by the transferred financial asset against costs or expenses incurred by the associated liability.

_____

1. CNBV, Circular Única de Bancos.
2. Only in the case of the repurchase of financial assets or interest benefits when the amount of those assets has been reduced to such an extent that the cost of its management is considerably higher than the revenues it would earn were the SPE to continue operating.
3. The power to participate in decisions on the financial and operating policies of an entity without owning a controlling stake.
4. Contractual agreement under which decisions are made jointly and unanimously by all the participants regarding the financial and operating policies of a joint venture, in order to obtain benefits from it.

Box 19

Accounting Rules on Investment in Securities and Repos

A repurchase agreement, or repo, is a transaction by which the buyer of a certain amount of credit securities pays a sum of money and agrees to return to the seller other securities of the same type, in an agreed-upon period of time and against reimbursement of the same price plus a premium. The premium benefits the buyer, unless otherwise agreed.[1]

Classification and registry of the securities[2]
Securities that are acquired must be recorded according to the intention of the buying entity: securities for trading, securities available for sale, or securities held to maturity. For this last category, the buyer must have the resources available to continue financing the investment until maturity, or be free of any legal or other restriction that might stand in the way of the intention to hold it to maturity.

Classification of Investment in Securities

CLASSIFICATION	VALUATION	RESULTS REGISTERED UNDER
For trading	Fair Value[3]	Trading results
Available for sale	Fair Value[3]	Stockholders' equity
Held to maturity	Not valued; entered at value of principal plus interest (amortized cost)	Market-related results, when sold or there is depletion of security value
		Stockholders' equity when reclassified

In October 2008, in order to bolster the liquidity of Mexico's financial institutions, the CNBV allowed them on a one-time basis to re-classify "securities for trading" to the category of "securities available for sale" and "securities held to maturity," and to reclassify "securities available for sale" to the category of "securities held to maturity." Under the current rules, they cannot re-classify securities between categories unless the change is from "held to maturity" to "available for sale."

Modification of repo regulations
The CNBV recently introduced changes to its accounting regulations regarding repos[4] .Repo transactions are not governed according to the legal nature of the transaction, but by their economic nature. In other words, the repo is basically a collateralized loan, in which the lender delivers cash (a loan) and receives the assets (securities) only as collateral on the transaction, because the borrower retains the risks, benefits, and control of those securities. As a result of the new accounting treatment, the related financial assets are recognized as restricted investments on the borrowing institution's balance sheet, so the associated assets and liabilities may not be netted against each other.

As of October 2008 banks could only enter into repo contracts with assets classified as "securities for trading." Under the new rule and supporting the accounting rule waiver previously commented, institutions can enter into repo agreements not only with securities for trading, but also with securities classified as "available for sale" and "held to maturity."

Finally, the modifications to the regulation allow the accounting treatment of repo transactions to converge both with international practices and with international accounting standards. This makes the financial information of Mexican banks more comparable with that of their international peers, and also makes the markets more efficient by increasing institutions' liquidity.

1. Ley General de Títulos y Operaciones de Crédito, Artículo 259.
2. Criterio B-2: Inversiones en Valores, CNBV Circular Única de Bancos.
3. Amount for which an asset can be exchanged, or a liability settled, between informed, interested and equally disposed parties, in a fair-market transaction (usually mark to market). Pricing of securities is provided by a price vendor supervised by the CNBV.
4. Criterio B-3: Reportos, CNBV Circular Única de Bancos.

Participation of foreign investors

Foreign financial institutions are owners of or have a majority stake in a large number of banks (and financial groups with a bank) established in Mexico (Box 9). The current crisis led financial institutions that are the parent companies of Mexican banks to post huge losses. However, the financial situation of these companies does not threaten the solvency of financial institutions established in Mexico or the stability of the Mexican financial system, despite some of them having registered very heavy losses. Unlike other countries Mexico has not allowed foreign banks to operate under the branch concept but only as subsidiaries.[9] All banks offering their services locally are business corporations established in accordance with Mexican law. Therefore, although foreign companies have stakes in them, their legal personality is separated from the one applicable to their parent companies. In addition to reducing the risks of direct financial contagion between the foreign institution and the Mexican one, all banks

[9] Whichever the country, the branch of a foreign bank is an extension of the same legal personality as the parent company, operating like another of its offices, whereas the subsidiary of a foreign financial institution is established under a separate legal personality and is subject to the same regulations as local banks. This distinction is particularly important in terms of the protection of foreign financial institution banking subsidiary depositor and creditor rights in the event of bankruptcy. In this event, legislation in a number of countries (for example, Australia and the United States) gives payment priority to the creditors of subsidiaries established in the country where the parent company is located over creditors of branches located abroad, resulting in first and second class depositors

offering financial services in Mexico are subject to the same regulations, including those related to liquidation. Furthermore, Mexican legislation places very strict limits on transactions between banks established in Mexico and their parent companies. For example, the Credit Institutions Law states that transactions between a bank and its related parties must not exceed 50 percent of net Tier 1 capital.[10]

Table 9
Foreign Investors' Equity Share of Financial Groups and Banks Established in Mexico

Foreign Investors' Share Percentage of Equity	2005		2008	
	Number of banks	Market share[2/] Percentage	Number of Banks	Market share[2/] Percentage
More than 99 percent[1/]	15	79.1	20	76.6
Between 51 and 99 percent			1	0.0
Between 10 and 50 percent	1	1.4	5	6.7
Less than 10 percent	13	19.5	17	16.7

1/ In order to establish a corporation, Article 89 of the General Business Corporation Law (Ley General de Sociedades Mercantiles) requires a minimum of two partners who must subscribe at least one share each.
2/ Given as a percentage of the system's assets.
As at December 2008, the number of banks was 43 because they included GE Money Bank. As of April, 2009 the assets of this bank were transferred to GE Sofom, E.N.R.
Source: CNBV and Banco de México.

Even so, a large number of banks and global financial groups have become undercapitalized due to the current crisis and must make efforts to lower risk and leverage levels. In order to do so they will have to expand their capital base, eliminate part of their risk positions, withdraw some business lines and sell part of their subsidiaries. This situation could have diverse impacts on markets in which global banks participate as well as on the financial systems of countries where their subsidiaries are established. In Mexico, the reduction in risk positions has had a particularly negative impact in Mexico on private sector credit and liquidity in foreign exchange, debt and derivative markets (see section 4). The possible liquidation of subsidiaries or their sale and merger with extant financial institutions could lead to a higher concentration of financial services supply in economies in which foreign financial institutions boast a large share of the financial market.[11]

5.2. Profitability

Banks as a whole continued to generate profits during 2008 and the first four months of 2009 despite an adverse international environment and a sharp

[10] Related transactions refer to all deposits, loans or credit, including net positions in favor of the institution from derivative transactions as well as investments in securities other than stock. The Credit Institutions Law (Ley de Instituciones de Crédito) considers the foreign parent companies of Mexican banks a related party. Under Mexican law, parent companies established abroad are not part of the Financial Group (see Box 24 of the 2007 Financial System Report).

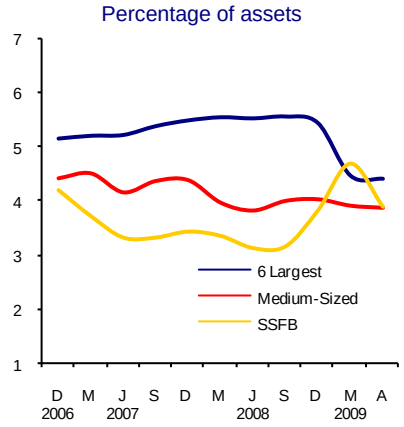
[11] Several global banks have sold subsidiaries and business lines in countries such as Argentina, Italy and Japan, among others. Recently published stability review reports of some central banks point to the possibility of a reduction in the number of derivative market participants and bilateral credit lines, adversely impacting the renewal and cost of hedging transactions. (For example, see National Bank of Poland, Financial Stability Review, October, 2008).

increase in loan-loss provisioning expenses. Nevertheless, operating profit[12] fell by 31.6 percent during 2008 year-on-year (Table 10).[13]

Graph 47 shows banks' different revenue sources compared to asset size. These three sources comprise revenue from: i) net interest income; ii) the buying and selling of securities, currencies and trading book revaluation (trading income) and iii) fees and commissions.

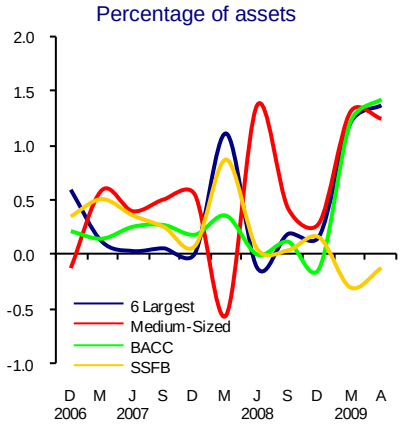
Graph 47
Commercial Banks' Revenue Sources

a) Net Interest Income



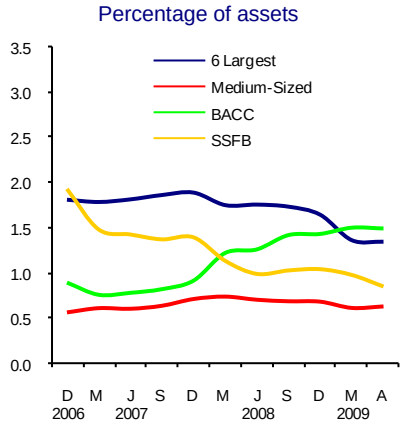
Figures as of April, 2009.
Source: CNBV.

b) Trading Income[1/]



Figures as of April, 2009.
Source: CNBV.

c) Net Fees and Commissions[2/]



Figures as of April, 2009.
Source: CNBV.

1/ Trading income comes from profits and losses from the buying and selling of securities, currencies, metals and derivative instruments as well as the revaluation of these positions.
2/ Net fees and commissions = Fees and commissions charged less fees and commissions paid.

[12] Operating profit does not consider, among other items: taxes, non-recurrent income and expenditure and the results of subsidiaries.

[13] During the first four months of 2009, operating profit decreased by 3.2 percent in real terms year-on-year.

Table 10
Commercial Banks' Income Statement
Billion pesos

		December 2008					April 2009
		Commercial Banks	6 largest	Medium-sized	BACC	SSFB	
Net Interest Income	1/	239.5	195.5	19.2	15.6	9.1	76.7
(+) Net Fees	2/	65.6	58.9	3.2	1.0	2.5	20.5
(+) Trading Income	3/	7.6	5.9	1.4	-0.1	0.4	21.4
(=) **Total Income**		**312.6**	**260.4**	**23.8**	**16.5**	**12.0**	**118.7**
(-) Administrative Expenses	4/	159.1	123.7	14.7	14.1	6.5	54.3
(-) Loan-Loss Provisions	5/	103.2	89.7	5.1	4.2	4.2	40.0
(+) Other Net Income	6/	15.5	11.9	2.0	0.6	1.0	6.9
(=) **Operating Profit**		**65.9**	**58.9**	**6.0**	**-1.2**	**2.3**	**31.2**
(-) Income tax, Employee Profit Sharing and Other	7/	11.3	10.5	0.5	-0.3	0.5	7.1
(=) **Net Profit**		**54.7**	**48.4**	**5.5**	**-1.0**	**1.7**	**24.1**

Source: CNBV.
1/ Difference between financial revenues and costs. Financial revenues consist mainly of interest and yields from loans and securities and the premium obtained from repos and securities lending. It also includes commissions originated when credit is granted. Financial costs include mainly interest paid on deposits (sight deposits, time deposits, bank bonds, interbank loans and subordinated debt) and premiums paid for repos and securities lending.
2/ Difference between commissions charged and commissions paid.
3/ Income from trading consist of profits and losses generated from the purchase and sale of securities, currencies, bullion and derivative instruments, as well as the revaluation of these positions.
4/ The main items considered in this heading are personnel compensation and fringe benefits, rents, promotion and advertising expenses, depreciations and amortizations and IPAB quotas.
5/ Reserves to cover loan portfolio deterioration.
6/ Difference between other revenues and other costs. Revenues include income from the sale of real estate, furniture and equipment and adjudicated property and non-loan portfolio recovery. Costs include those generated by fraud, amounts missing at branches and losses from the sale of real estate, furniture and equipment and adjudicated property. But the main amounts of both revenues and costs cannot be clearly identified as they are grouped under the heading of "others".
7/ Includes Repomo, share of profit obtained by subsidiary companies and companies associated with the bank and results from non-recurrent transactions.

Net interest income

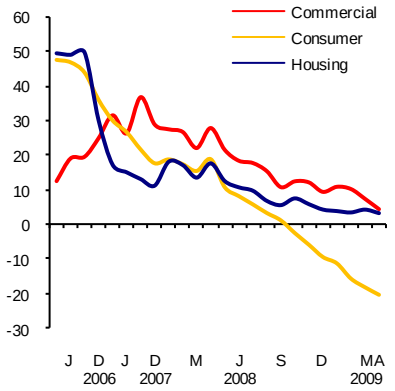
The main determinants of net interest income are: i) loan amount and composition; ii) market interest rates; iii) the structure of deposits.

The reduction in consumer credit and slower growth in commercial and mortgage loan portfolios (Graph 48) put pressure on net interest income during 2008 and the first four months of 2009. Within private sector financing, the consumer loan portfolio (the most profitable) continued to lose ground to corporate loans (Graph 49). Furthermore, within corporate loans, the amount of funds channeled to companies belonging to the largest economic groups (which usually charge lower interest rates) has increased. Changes in the composition of private sector financing have been uneven among commercial banks. In a number of cases the consumer loan portfolio amount decreased in absolute terms but company financing increased, with most of it going to the larger companies. For others, both consumer and commercial loans have decreased in absolute terms.

Graph 48
Commercial Bank Financing to the Non Financial Private Sector

a) Six Largest Banks

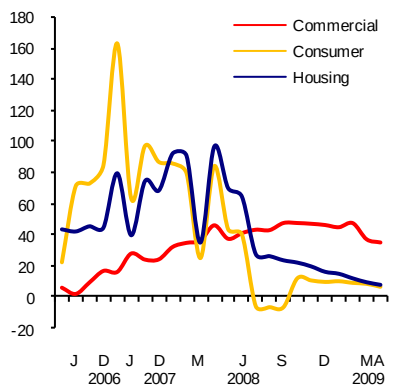
Real annual change in percent



Figures as of April, 2009.
Source: CNBV.

b) Medium-Sized Banks

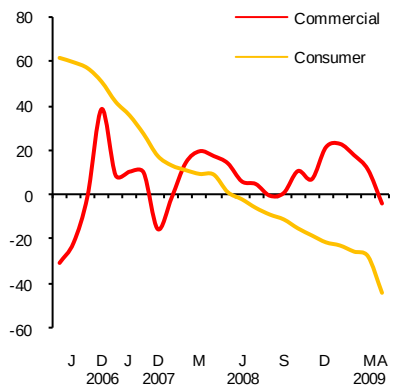
Real annual change in percent



Figures as of April, 2009.
Source: CNBV.

c) SSFB

Real annual change in percent

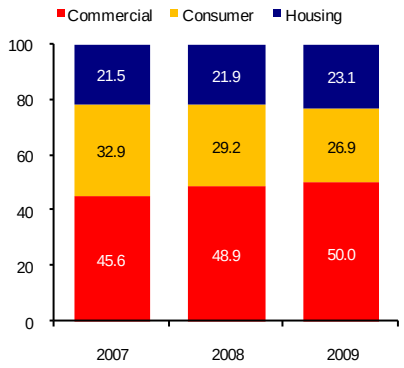


Figures as of April, 2009.
Source: CNBV.

Graph 49
Structure of Commercial Bank Credit to the Non Financial Private Sector

a) Six Largest Banks

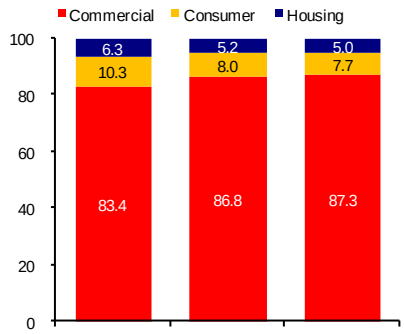
Percent



Figures as of April, 2009.
Source: CNBV.

b) Medium-Sized Banks

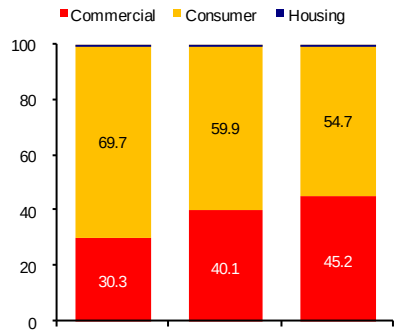
Percent



Figures as of April, 2009.
Source: CNBV.

c) SSFB

Percent



Figures as of April, 2009.
Source: CNBV.

The reduction in private sector financing and decrease in interest rates during the first half of 2009 have put downward pressure on banks' net interest income. However, during 2008, part of the slowdown in credit growth (and deterioration in consumer loans) was offset by a bigger spread between lending and borrowing rates. Last year's rise in lending rates due both to an increase in the 28-day TIIE and the credit margin (the spread between funding rates and TIIE) permitted a reversal of the effects of a slower pace of private sector financing. As a result, net interest income rose during 2008 compared to the previous year, albeit at lower rates than in prior years (Graph 50a).

The increase in the credit margin (spread versus TIIE) has been mainly due to a rise in consumer and commercial loan portfolio risk triggered by lower economic activity and unemployment as well as the deterioration in companies' balance sheets. All in all, the increase in TIIE in 2008 was reversed in 2009. Despite the change of trend in interest rates, the spread versus TIIE has remained at levels above those of the first half of 2008.

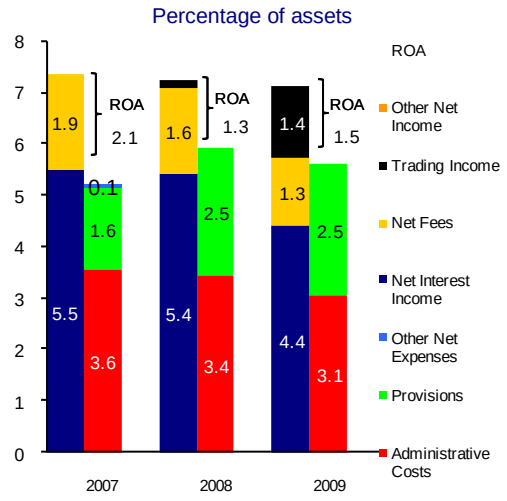
Graph 50a shows the banking sector's revenue and expense structure. The profits of the six largest banks decreased in 2008 and during the first four months of 2009, due mainly to higher loan-loss provision expenses. After representing 1.6 percent of assets in 2007, this item accounted for 2.5 percent of assets in April 2009. Regarding revenues, net interest income as a percentage of assets decreased from 5.5 percent in 2007 to 4.4 percent in April, 2009.

Growth in private sector financing, in particular consumer financing, enabled banks to offset lower interest rates in previous years. Similarly, higher interest rates during 2008 offset a slower pace of financing to the private sector during that year. In contrast, during the first four months of 2009, a decrease in market interest rates has combined with a reduction in consumer credit and corporate financing.

The return on assets (ROA) did not decrease beyond the level observed during the first four months of 2009, due to one-time income from the revaluation of security positions (trading income). This revenue was precisely the result of lower interest rates. Graph 50b shows the return on asset range for the largest banks. Graph 51 presents the revenue and expense structure as well as profits as a proportion of medium-sized banks' assets.

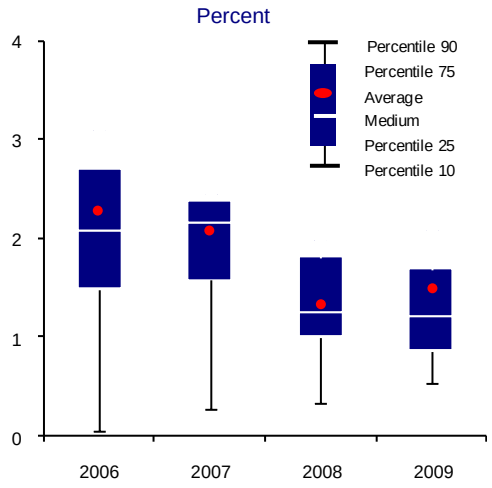
Graph 50
Income and Expenses Structure
Six Largest Banks

a) Income and Expenses



Figures as of April, 2009.
Source: CNBV.

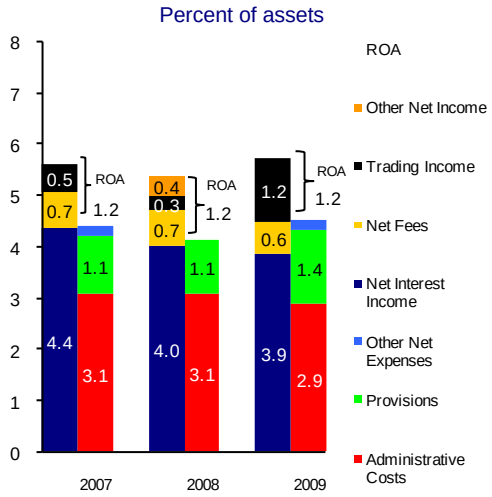
b) Return on Assets (ROA)



Figures as of April, 2009.
Source: CNBV

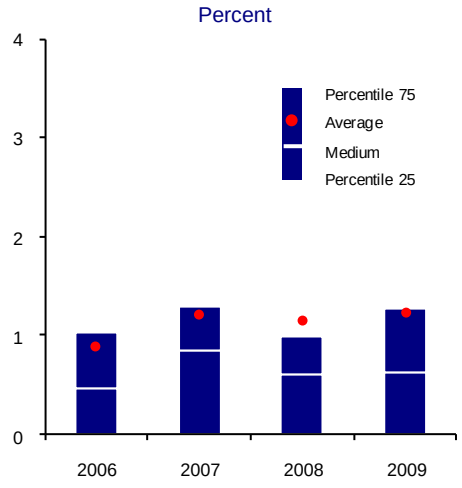
Graph 51
Income and Expenses Structure
Medium-Sized Banks

a) Income and Expenses



Figures as of April, 2009.
Source: CNBV.

b) Return on Assets (ROA)



Figures as of April, 2009.
Source: CNBV.

Trading income[14]

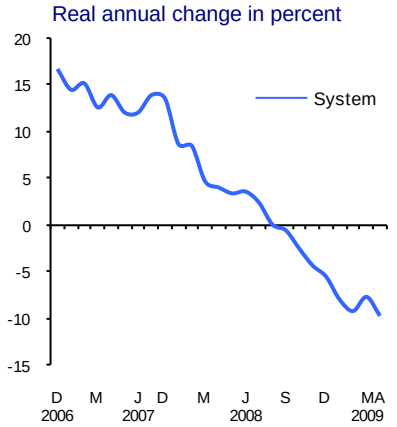
During 2008, trading income was 200 percent greater in real terms than at the end of 2007. Despite this increase, trading income made only a small contribution to total revenue. As at April 2009, trading income had increased on average and as a proportion of assets due to the effect of lower interest rates.

Fee income

Income from fees charged by banks decreased 5.6 percent in real terms in 2008 year on year (Graph 52a).[15] The contribution of fees to total revenue is relatively higher in the case of the largest banks and small bank subsidiaries than in the case of medium-sized banks, due to the weight of credit card income for these banks (Graph 52b and c). The structure of fees varies among the different types of banks. Thus, in the case of the six largest, credit cards account for 43 percent of income while 34 percent of BACC income comes from the opening of new accounts and account management (Graph 52c).

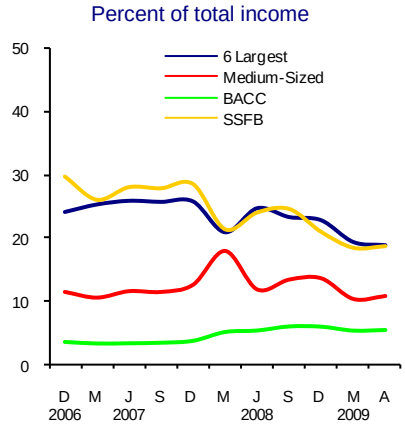
Graph 52
Fee Income

a) Fees Charged



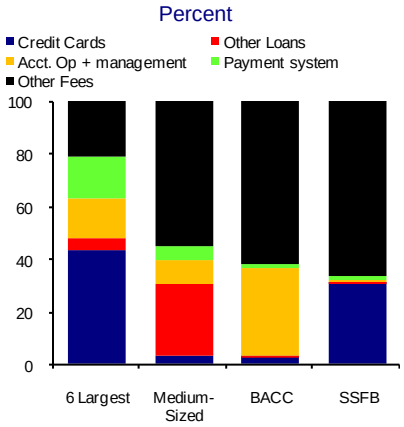
Figures as of April, 2009.
Source: CNBV.

b) Net Fees[1/]



Figures as of April, 2009.
Source: CNBV.

c) Income From Fees Charged[2/]



Figures as of April, 2009.
Source: CNBV.

1/ Net fees are obtained by subtracting commissions paid from commissions charged.
2/ Income from payment system fees and commissions includes fees and commissions from cash checks, certified checks, travelers' checks, remittances in route, fund transfers and electronic banking. Income from credit card commissions comes from annual fees paid by card holders, as well as the discount rate paid by businesses when they use cards. Income from fees and commissions grouped into "other loans" are fees and commissions charged recurrently for credit management.
3/ Other fees and commissions include fees and commissions for services (management and custody of goods, safety boxes, letters of credit, as well as others), fees and commissions from trust activities and other non-identifiable fees and commissions.

[14] Trading income consists of profits and losses generated from the buying and selling of securities, currencies, metals and derived instruments, as well as the revaluation of these positions.

[15] During the first four months of 2008, fees charged by commercial banks decreased by 9.8 percent in real terms year on year.

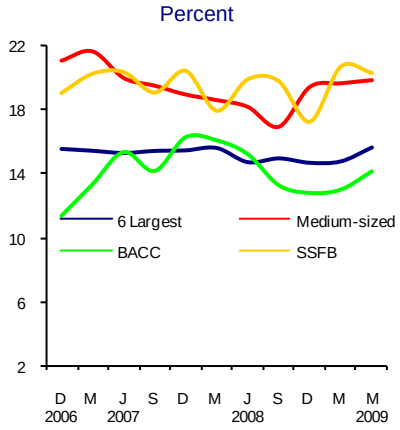
5.3. Solvency

As at May 2009, the capital adequacy index[16] (Índice de capitalización, ICAP) of the commercial banks was 16 percent. SSFB and medium-sized banks had the highest ICAP (Graph 53a). Banks' regulatory or regulatory capital mostly comprises Tier 1 capital (Graph 53b)[17].

January 2008 saw the introduction of new capitalization rules for banks. These rules are aligned with the New Capital Accord of the Basel Committee on Banking Supervision (Basel II). Under these rules banks must comply with the Standardized Approach to Credit Risks besides using Internal Measurement Approaches for certain business lines. Box 20 explains some of the problems faced by established banks in emerging economies while implementing internal models. The new rules introduce an operational risk capital requirement calculated using the Basic Indicator Approach.[18]

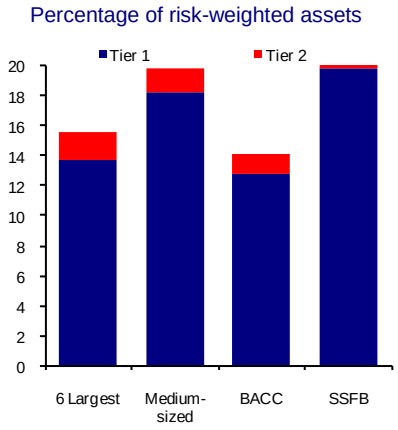
Graph 53
Solvency Methods

a) Capital Adequacy Ratio



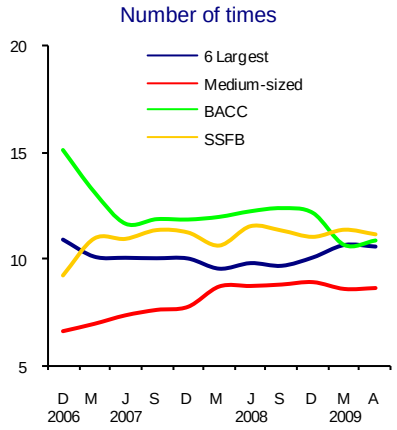
Figures as of May, 2009.
Source: CNBV and Banco de México.

b) Tier 2 and Tier 2 Capital



Figures as of May, 2009.
Source: CNBV and Banco de México.

c) Asset to Equity Ratio



Figures as of April, 2009.
Source: CNBV and Banco de México.

[16] The capital adequacy index is calculated by dividing net capital by risk weighted assets. According to capitalization rules, the quotient of this division must be at least 8 percent. Net capital is regulatory capital which comprises Tier 1 and Tier 2 capital. For further information please refer to Box 9 of the 2006 Financial System Report.

[17] During 2008 and 2009, several banks issued subordinated debt which is part of Tier 1 and Tier 2 capital.

[18] See Box 20 of the 2007 Financial System Report.

Box 20

The Difficulty of Using Basel II IRB Method in Emerging Economies

One of the objectives of the Basel Committee on Banking Supervision introducing the New Framework on Capital Adequacy (Basel II) was to ensure that regulatory minimum capital reflects more accurately the capital needs of banking institutions given the risks assumed. The new framework introduced modifications to credit risk requirements as well as an operating risk requirement.

Credit Risk Requirements

Under Basel II, the capital requirement for credit risk can be obtained by using various approaches: the Standard Method or the Internal-Risk Based (IRB) Method. While the Standard Method uses a series of weightings based on external ratings to measure risk exposure, under the IRB method, banks calculate capital based on the borrower default probability and other variables that indicate the probability of loss. This means Basel II gives banks a formula based on a single-risk factor model introduced by Vasicek in 1987.[1]
The model suggested by Vasicek assumes that a borrower will default on a debt when the value of its assets is below the contractual value of its liabilities.[2] To obtain the risk of default, we assume that the changes in the value of assets (X_i) depend first on a risk factor inherent to the system (Y) and second on an idiosyncratic risk factor exclusive to the borrower (Z_i):

$$X_i = \sqrt{\rho}Y + \sqrt{1-\rho}Z_i$$

Using certain distributional assumptions on those variables, it is possible to obtain a default rate Q_α that is not exceeded with a certain probability α. In this case, we have:

$$Q_\alpha = \Phi\left(\frac{\Phi^{-1}(PD) + \sqrt{\rho}\Phi^{-1}(\alpha)}{\sqrt{1-\rho}}\right)$$

To obtain the capital requirement, Basel II proposes:

$$K = EAD \times LGD \times (Q_\alpha - PD) \times M$$

Where EAD is the exposure amount, LGD represents the rate of loss in the event of default, and M is an adjustment that depends on the term of the debt. We can see that the required capital depends on the default rate Q_α, which depends on the default probability (DP) of the borrower, as well as its correlation with that of other borrowers (ρ).

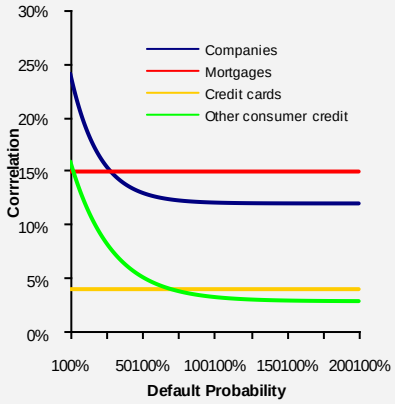
Calibrating IRB

In the above expression, a regulator must decide on two of the parameters used to obtain the default rate: level of confidence (α) and correlation (ρ). While the level of confidence was established heuristically at 99.9 percent to avoid losses that can exceed the institution's capital once every thousand years[3] and to protect the institution against errors in other parameter estimates, the correlation was obtained through an analysis of the information supplied exclusively by institutions belonging to the G10.[4,5]

Using information on defaults supplied by these G10 institutions, the Basel committee determined the default probabilities and correlations between the borrowers.

An analysis of this information reveals that the correlation diminishes as the likelihood of default increases, and rises with the size of the borrowing company. The ratios established by Basel II are shown in Graph 1.

Graph 1
Correlation proposed by Basel II by type of credit



The parameterization proposed by Basel II is intended to reflect observed portfolio dynamics and encourage firms with appropriate risk management to opt for replacing the Standard Method with the IRB Method. There is an incentive for the firm to do so because it would br benefitted from the reduction in regulatory capital that comes with migration to a more advanced model.

In the case of Mexico and other emerging countries, however, the observed characteristics of default in loan portfolios differ significantly from those seen in the portfolios used to perform the calibration. Some studies suggest that emerging countries tend to have more volatile portfolios with a closer asset correlation than industrialized countries.[6] This implies not only that the capital requirement proposed by Basel II may not reflect true credit risk, but it also reduces the incentives for banks operating in emerging countries to adopt the IRB method.

1. Vasicek, O. (1987), "Probability of Loss on a Loan Portfolio", Working paper, KMV.
2. This assumption is similar to the one developed in Merton, R. (1974), "On the Pricing of Corporate Debt: The Risk Structure of Interest Rates", Journal of Finance, 29: 449-470.
3. This assumption depends largely on the distributional assumption implicit in the formula.
4. G10 or "Group of 10" is made up of eleven industrialized nations: Germany, Belgium, Canada, United States, France, Holland, Italy, Japan, the United Kingdom, Sweden and Switzerland.
5. Basel Committee on Banking Supervision (2005), "An explanatory note on the Basel II IRB Risk weight functions".
6. See for example Balzarotti, V. et al (2004), "Reforming capital requirements in emerging countries: Calibrating Basel II using historical Argentine Credit Bureau data and CreditRisk+", Working paper CIF.

The international financial crisis has brought to the fore certain issues regarding the alignment of capitalization rules with recommendations made by the Basel Committee on Banking Supervision. More particularly, the extent to which the capital adequacy index is an effective indicator of bank solvency has been called into question. Some academics have raised doubts about the suitability of considering so-called hybrid instruments part of banks' regulatory capital given their very limited capacity to absorb losses. Such instruments include subordinated debt[19]. When debt cannot be converted into shares, it can only be absorbed in the event of bankruptcy or liquidation. Thus, an announcement regarding the deferment of interest payments on debt instruments can have an opposite impact on the market to the one desired.[20]

A tighter approach to measuring a bank's solvency would be to strip subordinated debt and deferred assets out of the regulatory capital calculation, as they can be partially accounted forl. This would result in so-called tangible capital and would provide a stricter measure of the funds available to an operating bank for meeting losses. A similar indicator has been used by United States regulatory authorities to calculate the capital requirements of that country's largest banks when faced with more pessimistic macroeconomic scenarios than currently envisaged (Box 6). The IMF suggests a tangible capital adequacy index in a 6 to 9 percent range.

As Table 11 shows, in the case of Mexican banks, the capital adequacy index calculated using tangible capital is close to the one estimated on the basis of Tier 1 capital and surpasses internationally recommended levels. In Mexico, regulations related to capital requirements and regulatory capital components have recently been revised and brought into line with stricter international regulatory criteria. Another indicator commonly referred to is the level of leverage which measures the total assets to equity of a bank. Unlike many countries, in the case of Mexico the level of debt decreased during 2008.

[19] Regulations allow capitalization instruments (including subordinated debt) and, to a more limited extent, other intangible assets such as deferred taxes to be included in net capital. Most of the Tier 2 capital comprises subordinated debt or bank capitalization instruments. Subordinated debt is issued with certain characteristics enabling it to be used as additional capital. These characteristics include the deferral of interest payments or an extension on the payment of principal. Basel Committee recommendations and the capitalization rules of many companies permit debt with such characteristics to form part of Tier 1 or Tier 2 capital (as it is known internationally). Under the guidelines established by the Basel Committee on Banking Supervision and reflected in Mexican capitalization rules, banks may include subordinated debt in Tier 1 capital amounting to up to 15 percent of the total and an amount not exceeding 50 percent of Tier 1 in Tier 2 capital. Under Mexican regulations, when a bank's capital adequacy index falls below the required minimum, as a pre-emptive measure the CNBV may give the order for the actions described in the characteristics of subordinated debt to be exercised.

[20] The financial and legal characteristics of so-called hybrid instruments vary from country to country. Thus, subordinated debt, silent partnerships and preferred shares do not have the same capacity to absorb losses and neither are they treated in a similar way in different countries in the event of a bank being liquidated even though these instruments are considered in the capital. Hence there are a number of initiatives aimed a tightening the international definition of Tier 1 capital.

Table 11
Commercial Banks' Assets, Capital and Debt

Bank	Assets	Net Capital Index	Tier I Index	Tangible Capital Index	Leverage	
	Billions pesos				Assets / Equity	ASR / Equity
		Percent	Percent	Percent	Times	Times
BBVA Bancomer	1,185.3	16.0	12.7	10.7	12.0	8.0
Banamex	1,072.3	18.7	18.4	16.6	8.9	4.6
Santander	704.8	13.3	13.1	12.2	9.6	7.2
Banorte	545.5	15.0	10.1	8.6	15.8	8.5
HSBC	450.2	11.9	9.3	8.4	15.4	9.3
Inbursa	216.2	22.1	21.8	21.3	5.6	4.1
Scotiabank Inverlat	150.2	15.1	14.9	14.9	6.3	6.1
ING Bank	116.0	13.3	13.3	11.8	16.7	8.4
Del Bajío	71.4	15.9	15.4	15.4	8.4	5.7
IXE	67.3	16.5	11.3	9.9	18.8	7.3
Azteca	60.4	13.4	11.5	8.8	14.8	8.6
Interacciones	53.3	15.4	10.0	10.0	20.9	9.9
Afirme	41.7	14.4	14.1	14.1	19.1	6.8
Banregio	31.8	14.0	9.5	9.4	16.2	9.1
J. P. Morgan	30.1	25.9	25.9	25.9	7.2	3.7
Invex	20.6	17.3	16.9	15.1	11.3	5.7
Bank of America	21.5	30.9	30.8	30.8	6.6	3.1
Mifel	25.3	19.0	9.5	8.2	27.1	11.0
Credit Suisse	17.2	24.0	24.0	23.4	21.5	4.2
American Express	16.7	12.0	8.5	6.1	8.5	7.4
Bansi	23.2	19.4	19.2	19.2	24.3	5.0
Multiva	16.2	14.0	13.7	12.2	15.9	6.6
Barclays Bank	15.4	14.0	14.0	14.0	15.3	7.1
Ve por Más	11.5	15.8	15.1	14.2	14.1	6.3
Deutsche Bank	15.7	43.2	43.2	43.2	7.8	2.3
Monex	10.3	25.0	24.8	24.8	13.9	4.0
Compartamos	8.1	40.2	39.8	39.8	2.7	2.5
Ahorro Famsa	8.2	11.3	10.8	10.8	8.4	8.2
Royal Bank of Scotland	6.0	35.2	35.0	35.0	7.4	2.8
Tokyo-Mitsubishi UFJ	4.5	25.5	25.1	25.1	6.4	4.0
Regional	3.7	17.2	17.0	17.0	8.2	5.9
Bancoppel	3.6	17.6	17.6	14.9	6.1	3.8
Consultoría Internacional	2.8	59.3	59.3	59.3	4.2	1.5
Autofín	1.6	17.0	17.0	17.0	4.3	5.7
Prudential	1.6	152.4	152.0	152.0	3.8	0.7
UBS Bank	0.2	169.3	169.3	169.3	0.5	0.6
New York Mellon	0.8	257.8	257.8	257.0	1.1	0.2
Fácil	0.7	37.8	37.8	34.1	2.4	2.2
Amigo	0.4	91.5	91.4	81.7	1.1	1.0
Wal-Mart	0.7	62.8	62.8	49.5	1.5	0.8
Volkswagen	0.8	33.6	33.4	32.6	2.2	2.7

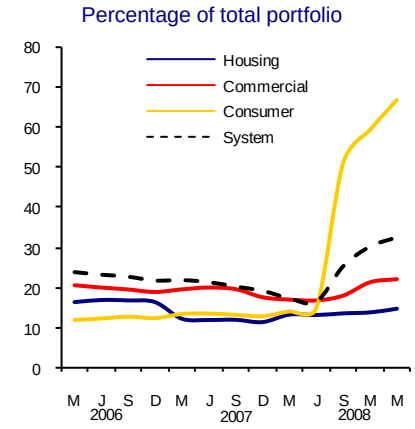
Figures as of April, 2009.
Source: CNBV and Banco de México.
BBVA Bancomer numbers include BBVA Bancomer Servicios.
Net capital index = regulatory capital / risk weighted assets (RWA). Tier 1 index = Tier 1 / ASR.
Tangible capital index = (Tier 1 capital – subordinated debt included in Tier 1 capital – deferred assets included in Tier 1 capital) / RWA.
Calculated using the definition of "Tier 1 Common Capital" in the "Supervisory Capital Assessment Program, Board of Governors of the Federal Reserve System".

Portfolio rating and reserves

The aim of reserves is to meet expected losses incurred by banks due to defaults on loans by borrowers (Box 21). Reserves were affected during the final two quarters of 2008 by a strong increase in loans with ratings below "A" in the consumer loan portfolios of commercial banks (Graph 54a) derived from an increase in loan delinquency. Likewise, in the case of revolving loans reserve creation weights were modified,[21] changes which affected mainly the largest banks and SSFB.

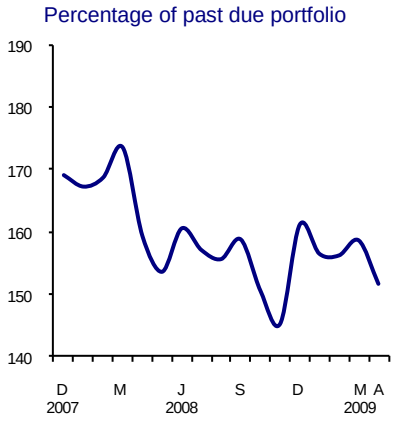
Graph 54
Portfolio Rating and Reserves

a) Portfolio With a Rating of Below "A"



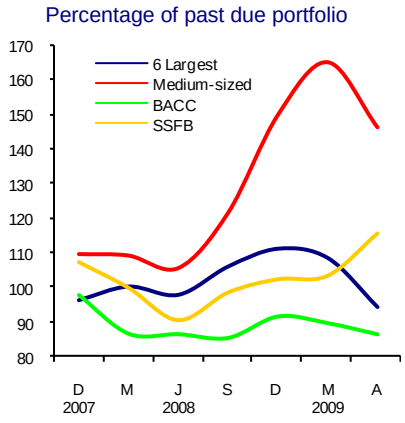
Figures as of May, 2008.
Source: CNBV.

b) Private Sector Credit Reserves



Figures as of April, 2009.
Source: CNBV.

c) Credit Card Reserves



Figures as of April, 2009.
Source: CNBV.

Despite an increase in consumer loan portfolio reserves, commercial banks' loan-loss coverage decreased during 2008 due to an increase in consumer credit past due payments, credit cards in particular. Nevertheless, the reserve level remains satisfactory (Graph 54b and c).

[21] For example, the weight for the portfolio with no past due payments increased to 2.5 percent from 0.5 percent.

Box 21

Credit Portfolio Rating Methodologies

One of the most widely-used tools for managing portfolio risk is the classification of loans by risk level.

There are a number of techniques for rating a loan, depending on the information available on the borrower, the characteristics of the loan, and external circumstances that may affect payment. There are also specific methodologies for large or small loans, which allow these evaluations to be conducted on a monthly or quarterly basis. Ratings also serve to determine the level of loan-loss reserves that must be created against a given loan or portfolio.

Credit ratings also factor in the personal and real collateral on the loans. Therefore, to determine the total risk of the transaction, the size of the loan is divided into the part that is covered by the collateral, and the exposed (uncovered) portion. The covered portion earns a higher rating than the uncovered portion, and the quantification of an improved risk profile depends on the characteristics of the collateral itself.

Mexican regulations[1] allow for two portfolio rating methodologies: the individual credit grade by loan in the commercial portfolio for large loans, and methodologies for managing large volumes of small loans, such as consumer credit, mortgage loans, and small business loans. These methodologies may be general or internal. The former uses guidelines defined by the regulators to determine risk levels by portfolio type. The latter uses elements determined by the banks themselves to calculate the expected credit loss, based on default probabilities and the severity of losses estimated using their internal models.[2]

The general methodologies differ according to the type of portfolio in question. The main differences include:

i) In the commercial loan portfolio exceeding 4 million inflation-indexed units (UDIs), the first aspect that is measured to determine how much reserves will be necessary against that loan is the individual creditworthiness of the borrower, which may be adjusted based on the value and characteristics of the personal and real collateral. In contrast, for consumer and mortgage portfolios, the first aspect that is considered is the required percentage of reserves based on the number of past due billing periods, and based on this, the credit rating is assigned (on these two types of portfolio, the methodology already factors in established percentages of severity).

ii) For consumer, mortgage and commercial loan portfolios consisting of loans below 4 million UDIs, the rating is assigned directly to the loans based on the number of delinquent periods (payment experience) without the need to rate the borrower. On the other hand, for a commercial loan portfolio with debts of more than 4 million UDIs, the ratings are assigned to the credit quality of the borrower (individual ratings) and based on these, a rating on each of the loans pertaining to them is calculated.

iii) The individual rating in a commercial loan portfolio takes into account not only payment experience but also other aspects, like country risk, financial risk, and industry risk.

iv) The general methodology for rating consumer loans distinguishes between revolving credits (credit cards) and non-revolving loans, assigning a higher percentage of reserves to the former.

There are five rating levels: A, B, C, D, and E. The A ranking is the highest credit grade while the E rating is the lowest (it includes loans considered irrecoverable under the methodology used), and for comparative purposes include both institutions that rate their portfolios according to the general methodologies provided in the Bulletin[3] as well as those that use internal models.

For some portfolio types, the methodology factors in additional degrees within the A, B, and C risk grades which provide more precise data for institutions and users of the financial information to evaluate the risk profile of their loan portfolios.

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1. Article 76 of the Credit Institutions Law and Chapter V of Title II, CNBV Unified Bank Bulletin.
2. Internal models are subject to CNBV authorization following compliance with the specific requirements set forth in the Bulletin.
3. CNBV Unified Bank Bulletin.
4. In the case of commercial loan portfolios, the A, B, and C ratings are divided into A1, A2, B1, B2, C1 and C2, and in the case of revolving consumer credit, the B grade is divided into B-1 and B-2.

5.4. Risks

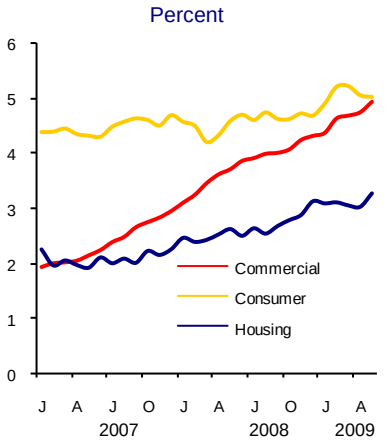
This section examines the credit, market, liquidity, contagion and legal risks faced by commercial banks. It also provides a model for adding credit and market risks and how the distribution of banking system losses and interbank exposure interacts. It also includes stress tests for estimating the effects on the banking system of extreme but plausible scenarios.

Credit Risk [22]

The last two years have seen a significant increase in the value at risk (VaR) of commercial bank credit. While in 2007 a higher VaR was due to a rise in the loan portfolio balance, the 2008 rise was due to an increase in the risk factors of which VaR is comprised: i) the probability of default; ii) the correlation between borrower defaults; and iii) loan portfolio concentration (Graph 55).[23]

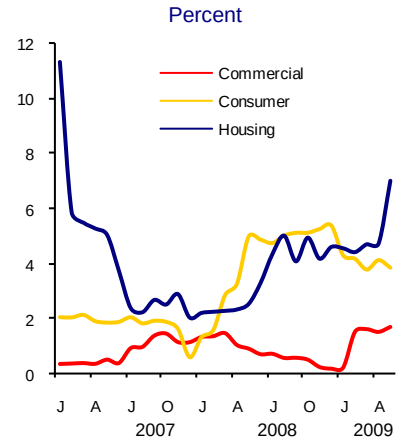
Graph 55
Probability of Default, Correlations and Concentration

a) Probability of Default



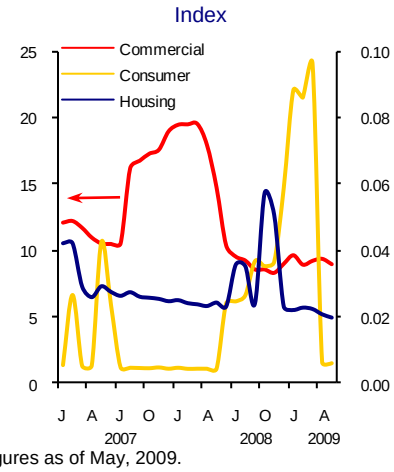
Figures as of May, 2009.
Source: Banco de México.

b) Default Correlation



Figures as of May, 2009.
Source: Banco de México.

c) Loan Portfolio Concentration (IHH)[1/]



Figures as of May, 2009.
Source: Banco de México.

1/ Commercial and mortgage x 10,000; Consumer x 100,000

The increase in credit VaR has been sector-wide (Graph 56a). As a proportion of capital, the biggest increase was at SSFB (Graph 56b). The portfolio which contributed the most to the rise in credit VaR was the commercial loan portfolio. This portfolio represents slightly more than half of total bank credit to the private sector (Graph 49). However, its contribution to VaR as at end-2008 was more than 60 percent. In contrast, the contribution of the consumer loan portfolio to the increase in risk was proportional to its relative weight in the total portfolio while the contribution of the mortgage portfolio was less (Graph 56c).

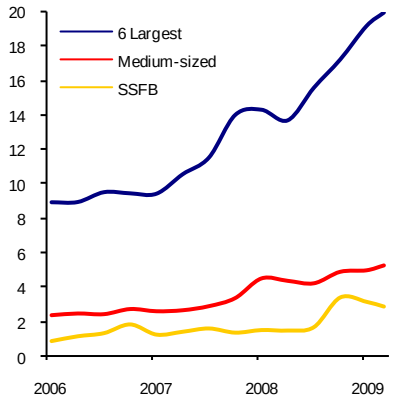
[22] Credit risk refers to the potential loss that a bank could incur due to payment default by its borrowers.

[23] The main elements used to calculate VaR employing the CyRCE Model are the probability of default, the variance-covariance matrix and loan portfolio concentration. Box 10 of the 2006 Financial System Report explains the methodologies used to estimate the probability of default and correlations.

Graph 56
Credit Risk Measures

a) Credit VaR

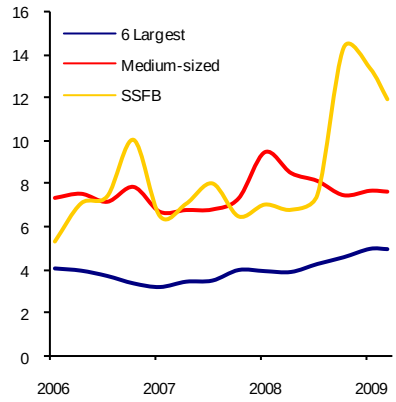
Billion pesos



Figures as of May, 2009.
Source Banco de México.
VaR estimated with a 99.9 confidence level.

b) Credit VaR

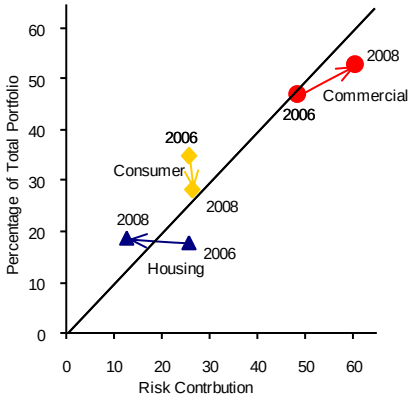
Percentage of regulatory capital



Figures as of May, 2009.
Source: Banco de México.

c) Total Credit's Contribution to VaR by Portfolio Type

Percent



Figures as of December, 2008.
Source: Banco de México.

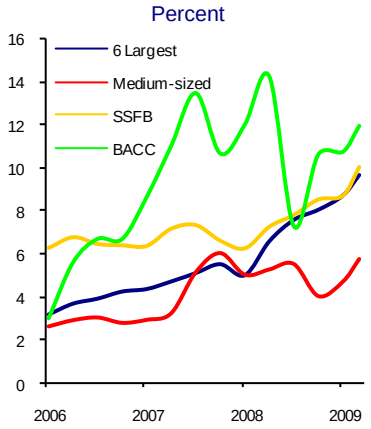
Consumer credit

The consumer credit balance decreased 5.3 percent in real terms in 2008 year-on-year and 20.4 percent year-on-year in May, 2009. The most affected segment is credit cards showing a real decrease of 24.5 percent year-on-year while credit for the acquisition of durable consumer goods (ABCD) decreased 17.9 percent in real terms for the same period.

The consumer credit delinquency index continued with the uptrend of recent years reaching 9.6 percent in May, 2009 (Graph 57a). Meanwhile, the Adjusted Delinquency Rate (IMORA), an indicator which includes loan portfolio write-offs, purchases and sales, rose to 23.2 as at the end of May, 2009 (Graph 57b). The probability of default of consumer credit increased for the banking sector as a whole with the exception of subsidiaries. However, the latter group accounts for only 2.8 percent of that market.

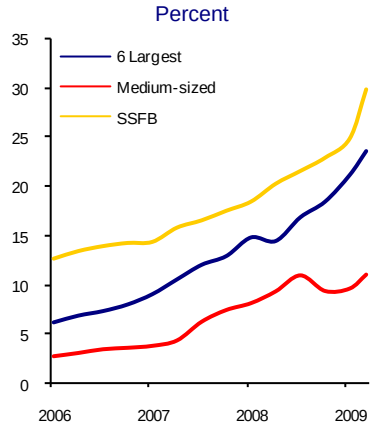
Graph 57
Consumer Loan Portfolio Risk Indicators

a) Delinquency Index



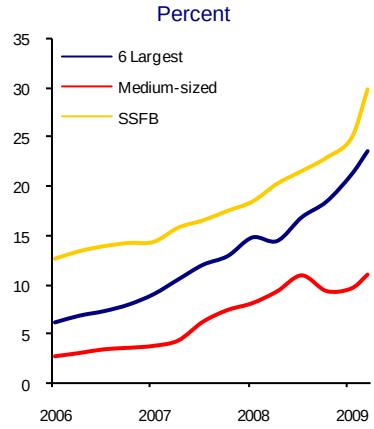
Figures as of May, 2009.
Source: Banco de México.

b) Adjusted Delinquency Index[1/]



Figures as of May, 2009.
Source: Banco de México.

c) Probability of Default



Figures as of May, 2009.
Source: Banco de México.

1/ The adjusted delinquency index is the past due loan portfolio ratio plus write-offs over the previous twelve months divided by the total loan portfolio plus write-offs over the previous twelve months.

Credit granted through credit cards constitutes the largest segment of consumer credit, accounting for 61 percent as at May, 2009. The rise in credit card past due payments during 2006 and 2007 was mostly due to credit having been granted to borrowers with no credit history and the issuance of several cards from different banks to a single borrower.[24] In 2008 and the first few months of 2009, loan delinquency was exacerbated by job losses resulting from the economic crisis.

Like any other credit, the trend in the credit card delinquency index is closely related to the borrower's financial situation. However, a characteristic of credit granted through credit cards is that it is short-term and interest rates are higher and revolving,[25] permitting a better and more opportune observation of the behavior of borrowers over time and enabling changes in their financial situation to be inferred.

A large proportion of credit card users usually pay off their credit card balance every month in order to avoid paying interest [26] which is consistent with the fact financing is expensive. Therefore, it can be assumed that people who use credit (credit card holders who pay interest on debt because it is not settled in the same calendar month) lack alternative financing sources or have to meet an unexpected and urgent need. Consequently, it can also be assumed that greater use of a credit line is related to a more vulnerable financial situation. Likewise, an increase in the proportion of credit card users that do not settle their balances at the end of the same calendar month (a decrease in the number of card holders settling the total amount of debt) is related to a deterioration in their financial

[24] According to data for a random sample of credit card holders in the Credit Bureau, in December 2005 around 50 percent of borrowers with a credit card also held cards granted to them by two or more other banks. By June 2008, that percentage had risen to 64. The difference is more obvious if it is considered that in December 2005 there were 7.5 million card holders but by June 2008 the number of card holders in the Credit Bureau was 12.2 million.

[25] A revolving loan is one that can continue to be used as long as previous dispositions are paid in full or in part.

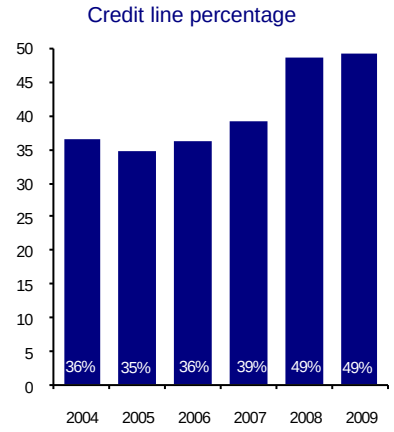
[26] Such people are known as "totalers" and for the last two years have accounted for around 30 percent of credit cardholders.

situation which could also be reflected in a decrease in the amount of credit paid each month as well as in an accumulation of defaults and the use of their credit card to obtain cash instead of pay for a good or service.[27]

From the behavior of credit card users during 2008, it is possible to conclude that their financial situation deteriorated. Thus, for example, the used proportion of credit lines (use ratio) rose from 39 percent in December 2007 to 49 percent twelve months later (Graph 58a). Likewise, during 2008 and the first quarter of 2009, the proportion of credit cards with past due payments increased more than four-fold (Graph 58b). This was reflected in an increase in the proportion of Credit Bureau files with at least one past due account to 18.3 percent in April, 2009 (Graph 58c).

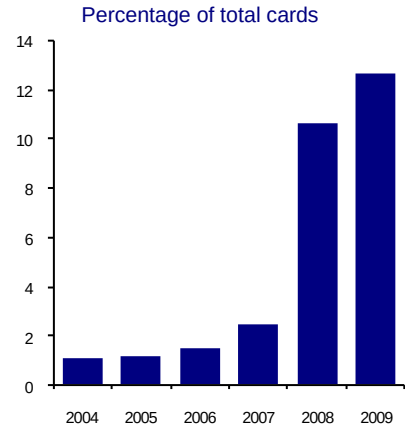
Graph 58
Indicators of the Financial Situation of Credit Card Debtors

a) Card Credit Used (Use Ratio)



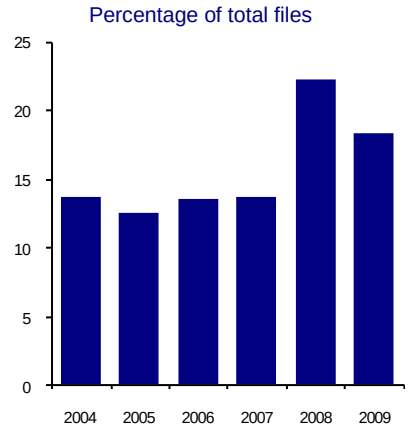
Figures as of March, 2009.
Source: Credit Bureau.

b) Credit Cards with Payments More than 60 Days in Arrears



Figures as of March, 2009.
Source: Credit Bureau.

c) Files with Past Due Accounts



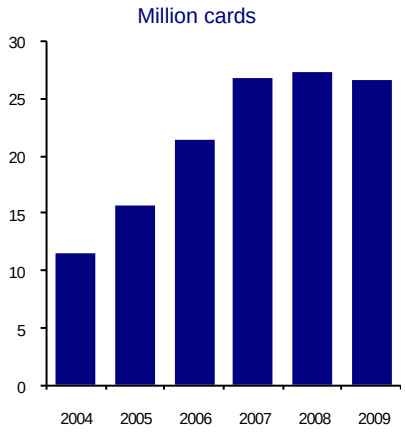
Figures as of April, 2009.
Source: Credit Bureau.

[27] A borrower's financial situation may also deteriorate owing to excessive indebtedness as a result of credit misuse. This situation usually occurs to a greater extent among borrowers who have less experience managing credit. In Mexico the proportion of cash dispositions compared with the use of credit cards to purchase goods or services has not increased. The use of cash dispositions to make payments on other cards was one of the factors that contributed to the South Korean credit card crisis. As a reference see: Kang and Ma (2007) "*Recent episodes of credit card distress in Asia*", BPI Quarterly Review.

Banks have responded to the deterioration in consumer credit by implementing diverse debt restructuring plans for borrowers who are in arrears and by using more stringent credit card granting criteria. Thus, the number of active credit cards[28] decreased by 2.6 percent during the first quarter of 2009 (Graph 59a). This has also been the case of credit line amounts which are down from a 2007 high (Graph 59b).[29] Finally, as a percentage of total credit cards, cards issued to consumers with no credit history have decreased to half its 2007 level (Graph 59c). These trends are consistent with a slowdown in consumer credit granting during the whole of 2008 and so far in 2009.

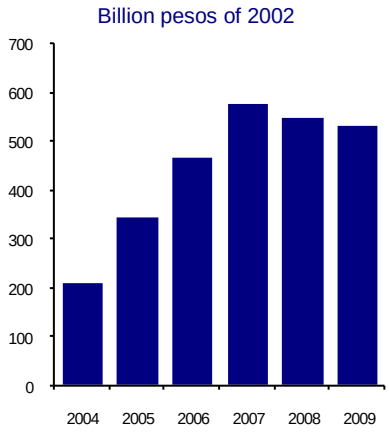
Graph 59
Trend in Credit Granted Through Bank Credit Cards

a) Active Credit Cards



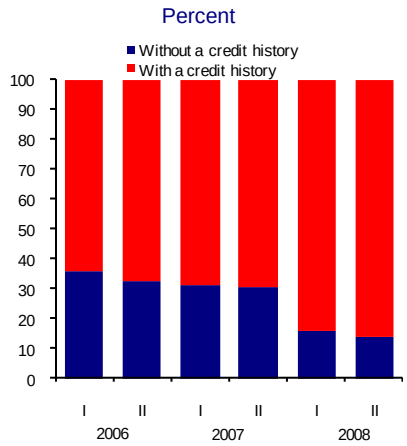
Figures as of March, 2009.
Source: Credit Bureau.

b) Amount of Performing Credit Lines



Figures as of March, 2009.
Source: Credit Bureau.

c) Credit Cards Granted to Persons with No Credit History



Figures as of December, 2008.
Source: Credit Bureau.

[28] The "active credit cards" figure reported by the Credit Bureau corresponds to the number of credit cards that can be used by their holders at any given time. This concept is similar to the "issued credit cards" published by Banco de México. Thus the number of "used credit cards" must be below the number of "active" and "issued" cards.

[29] The use ratio refers to the credit used by the borrower as a proportion of his or her credit limit.

Box 22

Asymmetrical Information and Delinquency Rates in Credit Card Portfolios in Mexico

In Mexico, the credit card market has grown significantly since 2000. During 2005 and 2006 this expansion accelerated, and only some of the new cards went to consumers with credit bureau records. The rest went to consumers who were entering the financial system through that first credit card.

The implications of this situation for the development of the financial system and for the risk profile of a credit card portfolio are different when the portfolio grows exclusively through the extension of banking services to new customers than when the expansion takes place through the provision of cards to clients that have already taken on some other form of credit.[1,2]

Under the first scenario, gains from an increase in the penetration of banking services in new population groups may offset the costs associated with the lack of information and greater risk the bank takes on with these clients.

Under the second scenario, on the other hand, the bank faces the risk of allowing customers excessive indebtedness levels if they do not properly examine their payment capacity. The increased indebtedness capacity of consumers raises the risk profile of clients who receive credit cards from banks with whom they have no prior relationship. The ease with which consumers can acquire new debt negatively affects all the banks with which a single customer has some business relationship, because their situation becomes more vulnerable.[3]

The following presents some results of a study based on a sample of Credit Bureau files in Mexico. The purpose of this study is to better understand the dynamics of the credit card market and analyze the validity of some common perceptions regarding this market. Specifically, it asks whether some groups of consumers are more inclined to default on one or more of their credit cards. The types of cardholders were:

- Credit card holders new to the banking system vs. those with prior credit records and outstanding loans.
- Credit card holders that had increased their borrowing capacity either through a new credit card or by obtaining an increase in their credit line vs. those that had not experienced any change in their borrowing capacity.
- Among card holders whose borrowing capacity had been increased, the study distinguished between those who had received the card from a bank with which they had some prior loan, and those that had no history with the bank that increased their borrowing capacity (at least during the period of analysis).

The study estimated the marginal changes in the likelihood that a cardholder would default on at least one payment, controlling both by demographic factors like age, sex, and seniority in the Credit Bureau, and the consumer's credit capacity.

Credit Card Holders New to the Banking System vs. those with Prior Credit Records

There is no conclusive statistical evidence to indicate that credit card holders new to the banking system are no more inclined to default on their payments and thus become delinquent on their loans than those with a longer track record in the financial system.

There are, however, differences between the two groups. The new card holders are younger on average, there are more women among them, and there is a higher proportion of past-due loans than among those with longer credit records. In terms of risk, the ratio of total portfolio to credit limit begins to rise for new cardholders after 24 months of seniority. Also, with the same percentage of their credit line used up, new card holders are more likely to be late in their payments than more experienced card holders.

Credit Card Holders that had Increased their Indebtedness Capacity

For borrowers that have had their credit cards for 6, 12, and 18 months and have received at least one increase in their borrowing capacity, either through a new card or an increase in their credit line, the likelihood of default increases. This effect diminishes after 24 months, which may be because, as Gross and Souleles (2002) indicate, once a card holder receives a higher credit line, they increase their debt levels and after some period of time, the percentage of their credit line that they use stabilizes again.[4]

Credit Card Holders whose Borrowing Capacity Increased Through a New Card from a Bank with which they had no Previous Relationship vs. those who had a Previous Relationship with the Bank that Expanded their Borrowing Capacity

Statistically, individuals who receive a card from a bank with which they have no previous relationship are more likely to default on their payments than those who receive an increase in the credit line from the same bank. This supports the assumption that banks have a monopoly on the material information on their clients, and that this information is significant for determining which cardholder should be allowed to increase his or her borrowing capacity.

Therefore, based on the answers to the second and third questions, we can conclude that successive increases in consumers' borrowing capacity, particularly among those with no previous credit relationship, has been a significant factor in the recent erosion of the overall credit card portfolio of Mexican banks.

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1. Lee, Kun-Ho (2005), "Risk in the Credit Card Industry When Consumer Types are Not Observable", KDI School of Public Policy and Management – KDI School Working Paper Series.
2. Black, S. y D. Morgan (1998), "Risk and the Democratization of Credit Cards", mimeo, Federal Reserve Bank of New York.
3. Bizer, D. S., P. M. DeMarzo (1992), "Sequential Banking", Journal of Political Economy, Vol. 100, No. 11, pp. 41 – 61.
4. Gross, D. y N. Souleles (2002), "Do Liquidity Constraints and Interest Rates Matter for Consumer Behaviour? Evidence from Credit Card Data", The Quarterly Journal of Economics, Vol. 117, No. 1, pp. 149 – 185.

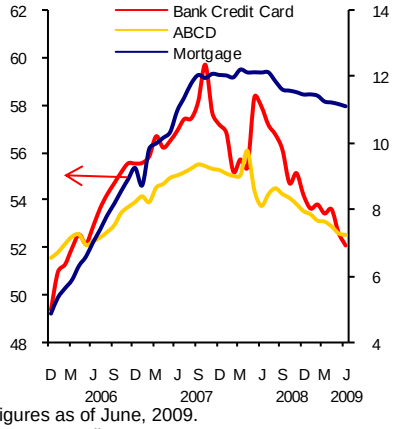
Analysis based on two random samples of Card holders

In order to gain further insight into the behavior of consumer loan portfolios, the trend over time of two random samples of card holders was analyzed. Each sample contains 15 thousand borrowers in the Credit Bureau's files. The first was obtained from individuals with mature credit accounts[30] while the second is representative of all borrowers in the Credit Bureau who as at May 2008 had at least one credit card.

September 2007 saw the beginning of a significant reduction in the number of consumer loans, especially bank credit cards (Graph 60a) while the number of mortgage loans remained at levels similar to those of 2007. As might be expected, the sample reveals a noticeable difference between the credit quality[31] of mature borrowers and the rest of the credit card population. However, interestingly, the sample shows a marked deterioration in the number of files up-to-date on their payments in the case of both mature card holders and the rest of the credit card population (Graph 60b and c).

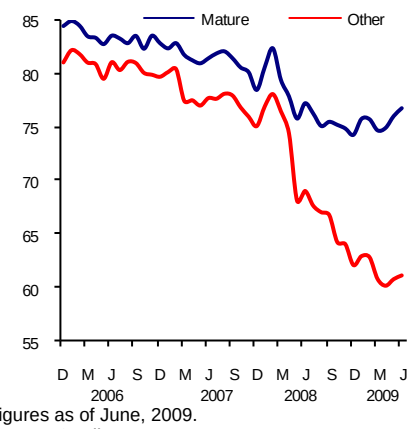
Graph 60
Behavior of Credit Bureau Borrowers Based on Samples

a) Loans of Mature Borrowers[1/]



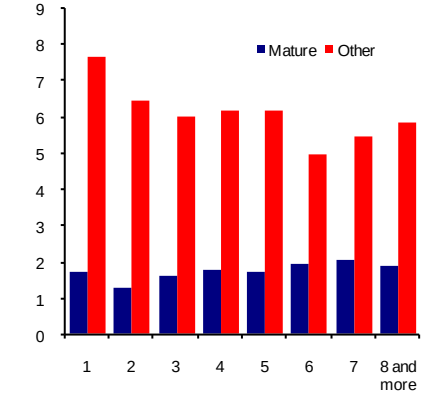
Figures as of June, 2009.
Source: Credit Bureau.
1/ ABCD is an acronym for Acquisition of Durable Consumer Goods.

b) Proportion of Files Up to Date on Payments



Figures as of June, 2009.
Source: Credit Bureau.

a) Delinquency Index of Card holders with Different Credit Cards



Figures as of June, 2009.
Source: Credit Bureau.

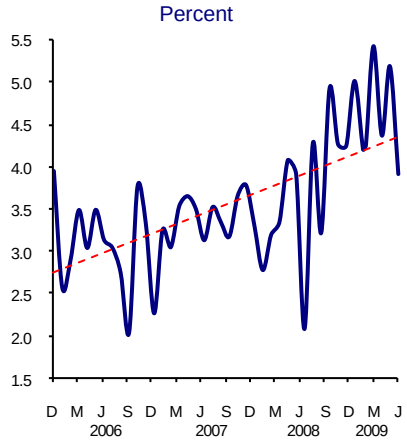
[30] A loan portfolio is considered mature when enough time has elapsed for banks to discount the greatest risks. The amount of time which must transpire for a loan portfolio to be considered mature depends on the type of loan. In the case of credit cards it is normally 18 months.

[31] Credit quality refers to payment punctuality and the credit line use ratio.

Besides the drop in the proportion of credit card holders up to date on their payments, there was a marked change in the proportion that went from having a payment in arrears to forming part of the past due loan portfolio. Thus, in March 2009, of every 100 files with a past due payment, 28 have ended up in the past due loan portfolio, or more than double the amount at the end of 2007 and more than four times the amount as at December 2005 (Graph 61b). Likewise, the proportion of files whose main borrowers have managed to get their payments back up to date has consistently decreased to just two percent of past due loans as at the second quarter of 2009 (Graph 61c).

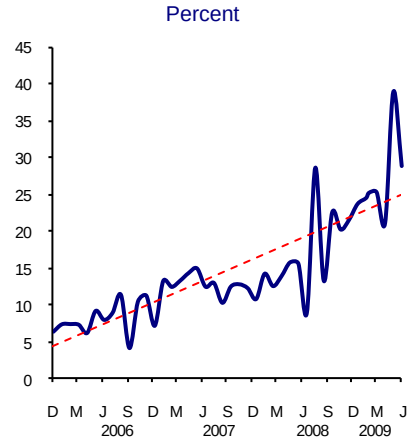
Graph 61
Transition Matrices

a) Card holders who Migrate From Being Up to Date on their Payments to Being in Arrears



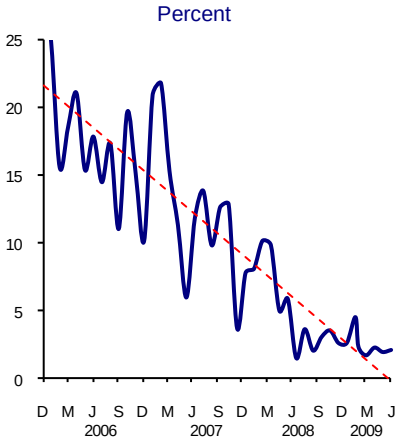
Figures as of June, 2009.
Source: Credit Bureau.

b) Card holders who Migrate From Having Payments in Arrears to Payments that are Past Due



Figures as of June, 2009.
Source: Credit Bureau.

c) Card holders who Migrate from Having Past Due Payments to Being Up to Date on their Payments



Figures as of June, 2009.
Source: Credit Bureau.

The credit line use ratio[32] is usually higher in the case of people who own more cards. Graph 62a shows how between December 2005 and the first quarter of 2009, the use ratio notably increased for card holders in general, independently of the number of cards owned. Furthermore, this increase occurred in the case of both mature card holders and others (Graph 62b). Not only did the delinquency levels of recently incorporated credit card holders with no credit history increased as of the second half of 2008, but it could also reflect the deterioration in the financial situation of borrowers in general.

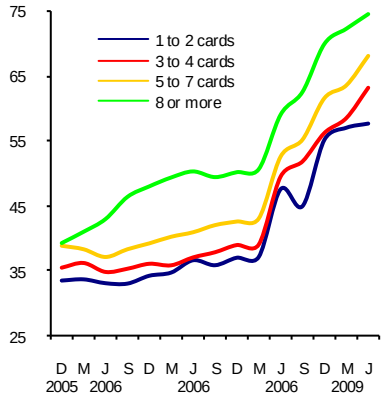
The sample also shows that the proportion of card holders who own credit cards issued by more than one bank substantially increased between December 2005 and June 2009. This is evident from Graph 62c which shows how the proportion of card holders owning cards issued by the same bank decreased from 48 percent at the end of 2005 to 40 percent in June 2009 while the proportion of people owning cards from more than three banks rose.

[32] The use ratio is defined as the credit balance quotient divided by the credit line amount.

Graph 62
Borrowers' Behavior and Number of Cards per File

a) Number of Cards per File

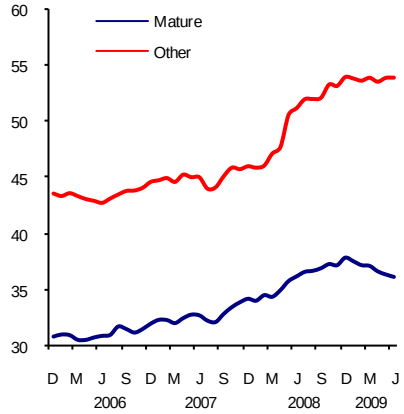
Percent of line use



Figures as of June, 2009.
Source: Credit Bureau.

b) Use of Credit Card Line

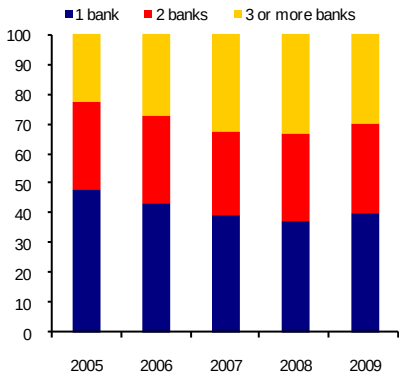
Percentage of the credit line



Figures as of June, 2009.
Source: Credit Bureau.

c) Card Holders who Own Cards from One or More Banks

Percentage of total card holders



Figures as of June, 2009.
Source: Credit Bureau.

Based on the available data it is not possible to conclude that borrowers in general are overly indebted, as this would require comparing the revenue and financial situation of each credit card holder. Although based on aggregate data (Box 23) household indebtedness has increased, it is apparently below levels for other countries. Unfortunately, there is not enough information to be able to undertake a detailed analysis of the system as a whole. In order to better assess the financial situation of households the information must incorporate a break-down of households by income level. However, the available information shows that lower income borrowers make greater use of their credit lines compared to income and have a higher delinquency rate.

Box 23

Financial Position of Mexican Households

In recent years, lending to Mexican households has been growing steadily. Despite the decline in key interest rates, this phenomenon has been accompanied by a rise in the debt service paid by households. In this section we will examine the trend in indicators of access to credit and household vulnerability in Mexico, using data from the National Household Income and Expenditure Survey (Encuesta Nacional de Ingreso y Gasto de los Hogares, or ENIGH) from 2000 to 2006. To measure vulnerability, we used the ratio of debt service payments to household income. This variable provides information on the proportion of household income that families use to pay for the credit they have acquired. It is a better alternative than the use of aggregate data, because it allows us to identify and characterize households that are effectively paying off loans. Thus, the families with the highest ratios in this category are classified as potentially the most vulnerable.

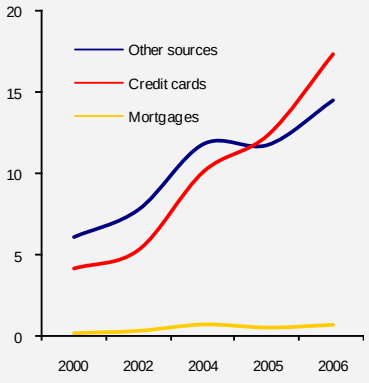
The data on debt service comes from the expenditure section of the ENIGH, which includes questions about the payments that households make on their credit cards[1], mortgages[2] and other loans owned to individuals or institutions (identified in the text as "loans from other sources")[3]. The ratio used as an indicator has limitations, because it is centered on the household's cash flow and not on its stock.[4] At the same time, the calculation of vulnerability with regard to credit card payments has the disadvantage that it does not distinguish between payers who settle their balances at the end of the month, called "convenience" users (those who use their cards only as a means of payment) and those who accrue and pay interest (who are borrowers in the true sense of the word).[5] Despite this, the variable can supply us with key information for identifying the groups that may pose a greater risk for the financial system.

Additionally, for this analysis it is important to distinguish between the types of credit that households take on. It is likely that households with a credit card will use it more for current spending, while the mortgage is clearly used to acquire a durable good that can be used as buffer stock in covering debts if there are adverse changes in household income.

Households that are Paying off a Loan and Debt Value

The percentage of households that are paying some kind of loan has grown over time.[6] Between 2000 and 2006, this figure rose from 10 to 28 percent (see graph 1).

Graph 1
Households Paying a Debt
Percent

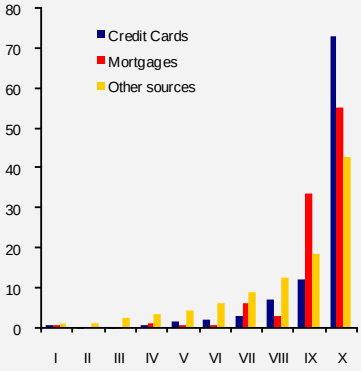


Data as of 2006.
Source: ENIGH.
Households may have debt in various categories.

Specifically, the percentage of households that reported payments on bank and commercial cards rose from 4 to 17 percent of the total number of households. Since 2005, this proportion has been greater than the fraction of homes that were paying off loans from other sources. The percentage of homes paying off a mortgage has nearly quadrupled, but the number of recipients of this type of loan is still modest.

In terms of the amount of payments, debt service on credit cards has become the largest outlay for households that report paying off a loan, rising from almost 40 percent of the total value of payments in 2002 to more than 50 percent in 2006. Payments on loans from other sources have tended to decline. This has been partially caused by a rise in the number of cards per household, due to the steady increase in bank service coverage in Mexico and in the use of these instruments for making purchases at point-of-sale terminals.

Graph 2
Percentage Breakdown of Debt Service Value by Deciles (2006)
Percent



Data as of 2006
Source: ENIGH

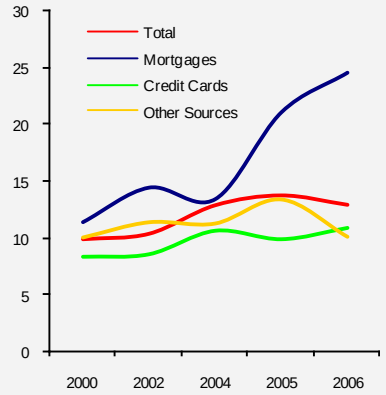
In order to examine the dispersion of the value of payments in various income brackets, the households were divided into deciles, based on current monetary income.[7] Households in the highest decile account for the biggest share of debt payments (see graph 2). Furthermore, as of 2006, credit extended through bank and commercial credit cards was most heavily concentrated in the top decile. Loans from other sources were more evenly distributed across all the income brackets.

Debt Service as a Proportion of Current Income

To place these debt payments in perspective, they were expressed as a percentage of current monetary income for each household.[8] This ratio was calculated by first taking the total debt service, and then distinguishing between payments made to credit cards, mortgages and other loan sources. As a result, it was concluded that among all the households that reported having a debt, the proportion of current income used to pay off debts in the last six years has risen at an average annual rate of seven percent, reaching 13 percent of current income in 2006 (see graph 3).[9]

Among survey respondents who reported having acquired a mortgage, the fraction of household income that went to service that loan has been particularly heavy, rising to 24 percent of current income in 2006. We can attribute this result, among other factors, to an increase in the monthly loan payments, which would mean that more expensive properties are being financed, or for shorter periods, or both. In addition, the ratio of payments on loans from other sources has diminished, while the proportion of credit card payments is rising.

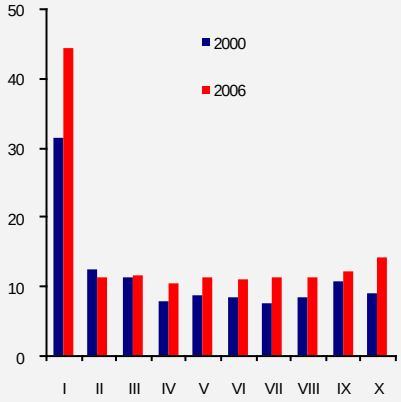
Graph 3
Debt Service in Proportion to Current Income
Percent



Data as of 2006.
Source: ENIGH.

In the income distribution, we can observe that between 2000 and 2006, the ratio of debt payment has increased in almost all brackets (see graph 4). Also, households in the lowest brackets (first and second deciles) tend to have very high ratios and higher variance. However, as explained earlier, these households do not account for a substantial proportion of total debt service. Meanwhile, households in the top income bracket (tenth decile), which account for most of the credit, report a substantial growth in the ratio.

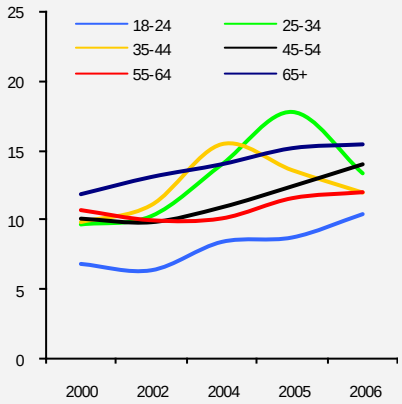
Graph 4
Debt Service in Proportion to Current Income
by Income Bracket
Percent



Data as of 2006.
Source: ENIGH.

By age group, the youngest households (whose family head is between 18 and 24 years of age) report a sharper increase in payment ratios (see graph 5). This may be attributable to reductions in restrictions on credit access for this group. Nonetheless the ratio for those households remains the lowest of the six age brackets. On average, the oldest households (whose family head is 65 or older) allocate the greatest proportion of their income to paying off debt.

Graph 5
Debt Service in Proportion to Current Income
by Age Bracket
Percent



Data as of 2006.
Source: ENIGH.

These results confirm that between 2000 and 2006, credit restrictions eased, particularly for households in low income brackets and with younger heads of family.

At the same time, families have had to devote a greater proportion of their household income to covering the service on their debts. Here, the households with the highest payment ratios are also those in the highest income brackets and tend to have older heads of household. This last group may face the risk of an adverse change in income, because many of them are close to retirement age.

Finally, the ratio of credit card payments has also been rising over time, and has been spreading to households in lower income brackets. This situation could pose a future risk for that group, because credit cards offer short-term and expensive credit and increases in this type of debt can make families more vulnerable.

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1. The reported payments include purchases, annual fees and interest on bank and commercial credit cards. They include "convenience" clients (clients who pay off the total balance of their cards every month) and revolving credit borrowers.
2. Mortgage payments include down payments and monthly payments.
3. This last category includes loans not included in the other two, thus loans can come from formal or informal sources.
4. For a more complete view of the situation we would need information on household net worth and debt, but the survey did not inquire into these aspects.
5. Approximately 25 percent of people paying off a bank credit card pays off the entire monthly balance at the end of the billing period.
6. Each household may be paying off more than one type of loan.
7. According to CONAVI, the total number of mortgages in 2006 was 1.17 million.
8. Current monetary income includes revenues from salaried jobs, income from self-employment, cooperatives, corporations, property rental, transfers, and others.
9. Calculations only include households paying off a debt.
10. For Chile, as of September 2006, the ratio of debt service to disposable income was 18.7 percent. For the U.S., at the close of 2008 it was 14 percent.

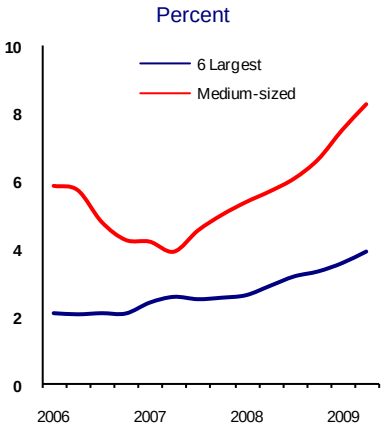
Bank Mortgage loans

Bank mortgage loans grew 8.3 perent in real terms during 2008. In May 2009, the performing balance of such loans registered real year-on-year growth of 5.1 percent. The mortgage loan portfolio is concentrated in the six largest banks, which hold 95 percent of all banking sector mortgage loans on their books. Mortgage credit risk indicators have remained at low levels. Thus in May 2009, the delinquency index for the six largest banks was 3.9 percent while for medium-sized banks it was 8.3 percent (Graph 63a). Likewise, write-offs included in IMORA remained stable (Graph 63a and b).

The dynamism of this sector in recent years has given rise to some concern about the level of household indebtedness. While there is a dearth of information in Mexico in this regard, surveys such as the National Survey of Household Income and Expenditure, la Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH), reveal a strong increase in household debt service as a proportion of income in recent years.

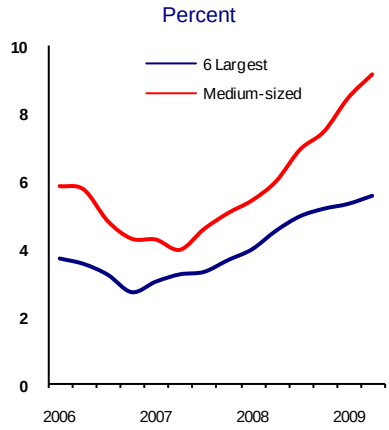
Graph 63
Mortgage Loan Portfolio Risk Indicators

a) Delinquency Index



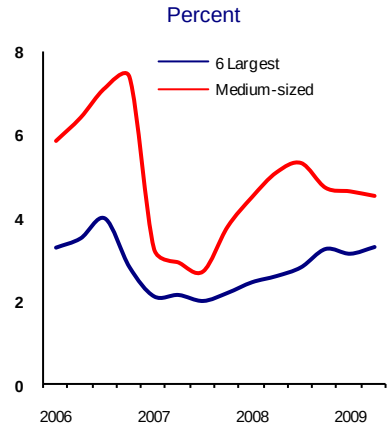
Figures as of May, 2009.
Source: Banco de México.

b) Adjusted Delinquency Index[1/]



Figures as of May, 2009.
Source: Banco de México.

c) Probability of Default



Figures as of May, 2009.
Source: Banco de México.

1/ The adjusted delinquency index is the past due loan portfolio ratio plus write-offs over the previous twelve months divided by the total loan portfolio plus write-offs over the previous twelve months.

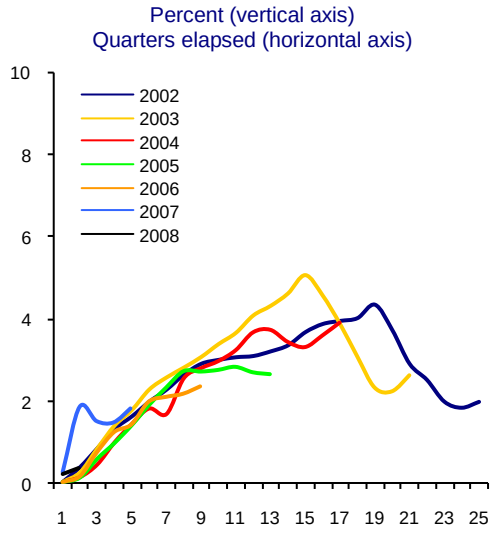
The outlook for bank mortgage loans remained stable and within expected parameters given the point in their life cycle,[33] banks generally serve lower-risk segments and have maintained more stringent loan origination criteria than other financial intermediaries (Graph 64 and 65).[34] The delinquency rate on loans granted by Infonavit is similar to that of the commercial banks (Box 24).

[33] See Box 23 of the 2007 Financial System Report.

[34] The term mortgage vintages refers to a set of loans granted to the housing sector over a given period, usually a year (see Box 23 of the 2007 Financial System Report).

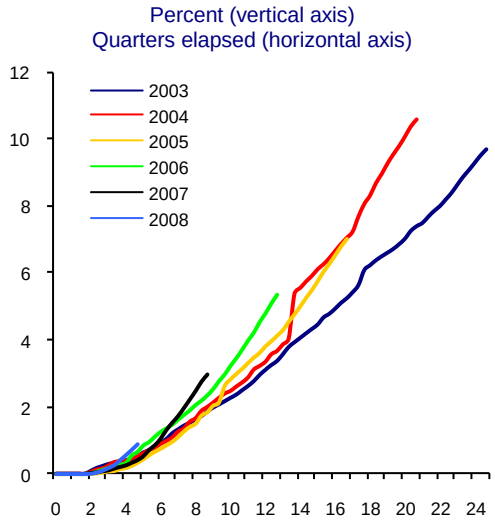
Graph 64
Mortgage Vintages of Banks and Sofoles/Sofomes

a) Mortgage Vintage Default Rate[1/]
Six Largest Banks



Figures as of December, 2008.
Source: Banco de México.

b) Mortgage Vintage Default Rate[1/]
Mortgage Sofoles/Sofomes

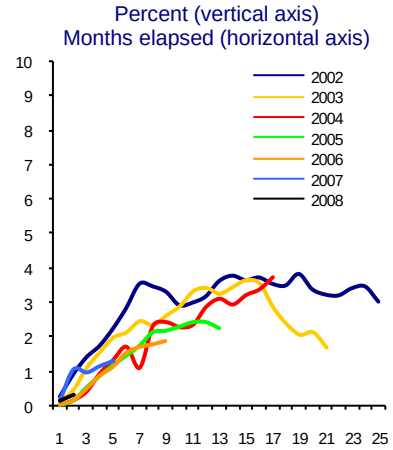


Figures as of December, 2008.
Source: SHF.

1/ The default rate corresponds to the number of loans that are not refunded in a given quarter divided by the original number of performing loans.

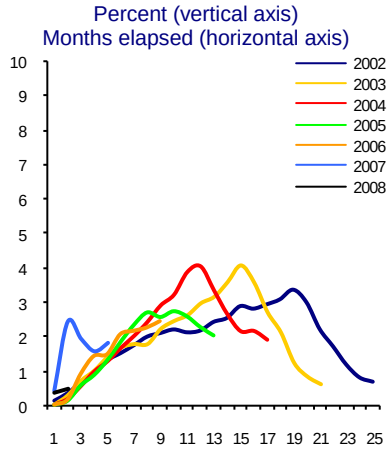
Graph 65
Bank Mortgage Portfolio Indicators

a) Default Rate of Mortgage Loans by Vintage



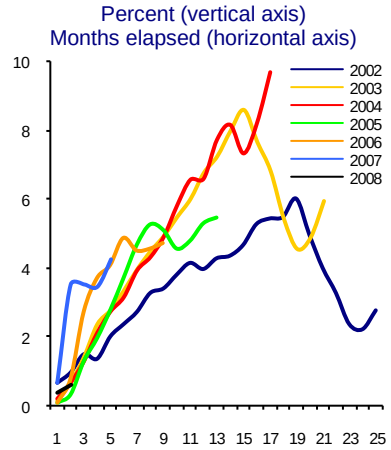
Figures as of December, 2008.
Source: Banco de México.

b) Default Rate of Middle-Income Housing by Vintage



Figures as of December, 2008.
Source: Banco de México.

c) Default Rate of Entry-Level Housing by Vintage

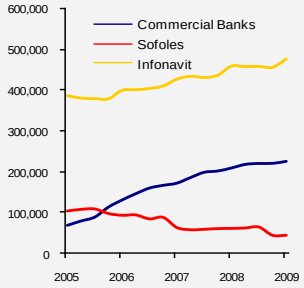


Figures as of December, 2008.
Source: Banco de México.

Box 24
Infonavit Portfolio

Infonavit is Mexico's largest mortgage lender. It has a portfolio 1.8 times larger than the banking system's and the Sofoles mortgage portfolio combined (see Graph 1). It is also the main agency responsible for financing housing for lower-income families. Infonavit has two purposes: to supply home financing, and to manage retirement funds. Infonavit is managed under a tri-partite structure, involving workers, businesses, and the federal government. This, combined with the extensive coverage and a vast membership base, makes the institution an indispensable benchmark for understanding trends in Mexico's mortgage industry.

Graph 1
Home Loan Portfolio by Intermediary
Billions pesos of 2002

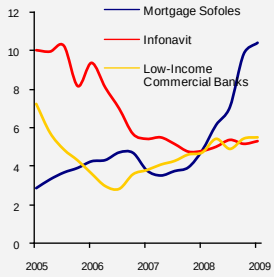


Data as of March 2009.
Source: Banco de México.

As of March 2009, Infonavit had a portfolio of 625.7 billion pesos, 3.8 percent more in real terms than in March 2008. In terms of its delinquency rate (IMOR), the portfolio has improved significantly. At the close of 2005, the delinquency rate on Infonavit's portfolio was 8.15 percent, and it improved to 5.66 percent by the close of 2006. It has been relatively stable since then, closing March 2009 at 5.29 percent.

The stability of the delinquency rate on this institution's portfolio in recent years stands in contrast to the deterioration of portfolios among mortgage Sofoles, which went from a rate of 3.99 per cent at the close of 2007 to 10.42 percent in March 2009 (Graph 2).

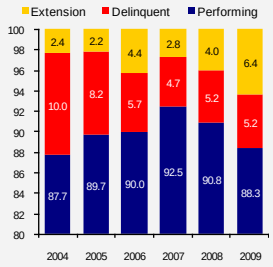
Graph 2
Delinquency Rate by Type of Intermediary
Percent



Data as of March 2009.
Source: Banco de México.

One of the reasons for the Institute's low delinquency rate is the structure of its contribution and collection. Both its funding and collection of its portfolio depend heavily on the structure of worker affiliation to the Mexican Social Security Institute (IMSS). Employers submit contributions to the Institute based on the number of workers they have that are affiliated with the IMSS. Infonavit collects loan payments from workers directly out of their paychecks. So for workers to obtain mortgage loans, they must be listed in IMSS, and as long as they maintain their labor relationship, Infonavit has its payments guaranteed regardless of the payment disposition of the worker.

Graph 3
Total Loan Portfolio
Percent



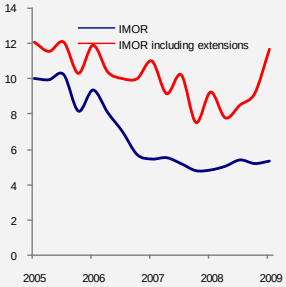
Data as of April 2009.
Source: Banco de México.

When Infonavit borrowers lose their jobs, they have the right to request an extension of up to 12 months on their payments. During that period, the loan is considered to be performing. In 2008, 554,000 Infonavit mortgage holders lost their jobs, and only 320,000 of them managed to get another job in the same year. This means that in the end, a portion of the extended portfolio will have to be classified as delinquent (see Graph 3).

The current economic climate, characterized, among other things, by a rise in unemployment, has affected the Institute's collection efforts. This situation caused an increase in the number of extended loans within Infonavit's portfolio, 48 percent higher in March 2009 than in March 2008. This, combined with the upturn in delinquency rates, led to a reduction in the proportion of performing loans. If all of the extended portfolio were to be declared in default, the delinquency rate would rise to nearly 12 percent (see Graph 4).

To reduce the impact of the crisis on workers that currently have mortgage loans, Infonavit introduced various relief plans. Among them are partial or total extension of the loan; unemployment insurance covering up to 6 monthly payments; socio-economic studies to set a new monthly payment in keeping with the borrower's payment capacity; restructuring of the loan; and adjustment of payments due to a reduction in wages or technical shutdown of the worker's place of employment. Infonavit has also prepared an employer incentives plan, offering a rebate of up to 5 percent of their contributions if they hire a person with an Infonavit loan that previously lost their job. With these measures, Infonavit intends to lower the cost of past-due loans for both the borrower and the Institute itself.

Graph 4
IMOR Adjusted for Extensions
Percent



Data as of March 2009.
Source: Banco de México.

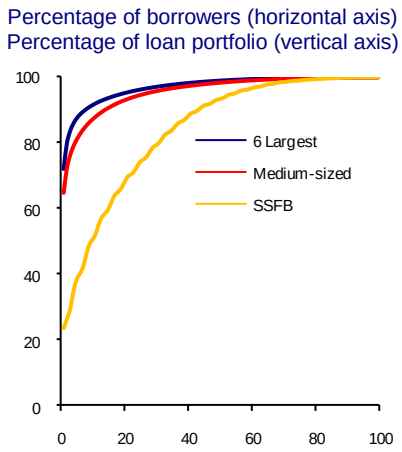
Credit to non-financial private companies

Commercial bank credit to non-financial private companies became less dynamic as of the second half of 2008. In May 2009, the performing balance registered real annual growth of 7.9 percent year-on-year (Graph 48).

Besides the decrease in the commercial loan portfolio growth rate there has been a notable increase in the concentration of financing from the largest banks to the largest companies. In the case of medium-sized banks, this greater concentration has been mostly among banks with a significant weight in this Group. Thus, 20 percent of borrowers with the largest amount of credit receive around 95 percent of all credit granted by commercial banks (Graph 66a). The trend of granting larger loans to an increasingly smaller number of borrowers has intensified in recent months, especially among the bigger banks (Graph 66b and c).

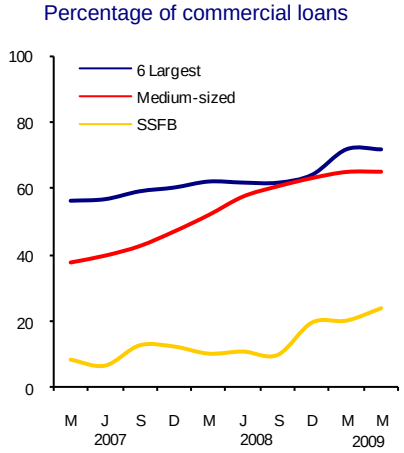
Graph 66
Commercial Loan Portfolio Concentration Indicators

a) Lorenz Curve[1/]



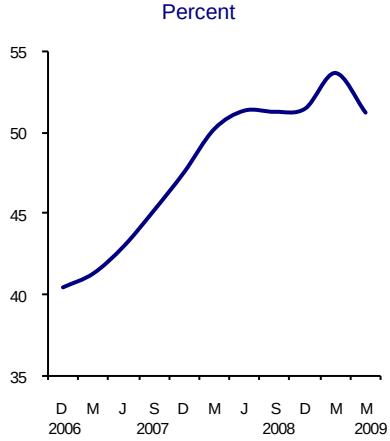
Figures as of May, 2009.
Source: Banco de México.

b) Loans Granted to One Percent of the Biggest Borrowers



Figures as of May, 2009.
Source: Banco de México

c) Percentage of Total Loans Granted to the 800 Largest Companies [2/]



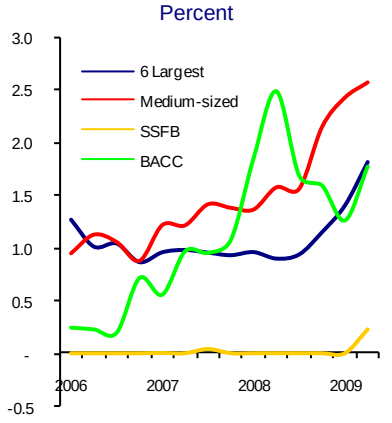
Figures as of May, 2009.
Source: Banco de México.

1/ The horizontal access shows the percentage of borrowers from the largest to the smallest amount and the vertical axis the percentage of the loan portfolio the accumulated amount represents. .
2/ Includes listed companies and Expansión 500 companies.

The greater concentration of commercial loans among the largest banks could be due to stricter credit conditions abroad. Due to the crisis, companies which previously obtained a significant part of their funding from international capital markets have been forced to resort to local banks. Companies which usually obtain funding abroad are those which due to their size and relative importance are able to tap international markets at more favorable interest rates and maturities. Thus the outstanding balance of dollar-denominated debt instruments issued by such companies decreased by 12 percent in December 2008 year-on-year. Greater loan portfolio concentration increases the vulnerability of banks to deterioration in the economic environment, as potential losses in the event of default are greater when the loan portfolio is more concentrated.

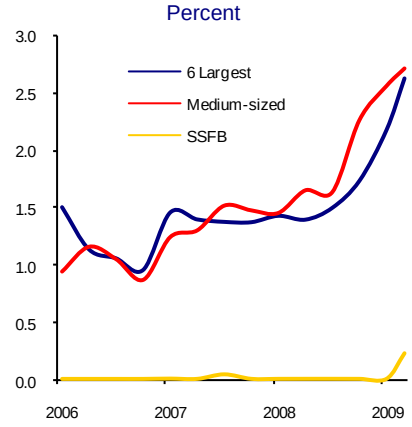
Graph 67
Commercial Portfolio Risk Indicators

a) Delinquency Rate



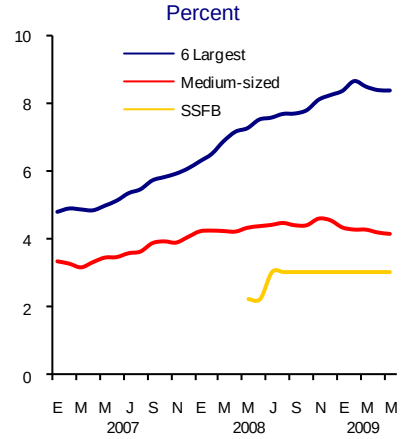
Figures as of May, 2009.
Source: CNBV.

b) Adjusted Delinquency Rate[1/, 2/]



Figures as of May, 2009.
Source: Banco de México and CNBV.

c) Probability of Default[3/]



Figures as of May, 2009.
Source: Banco de México.

1/ The adjusted delinquency rate is the past due loan portfolio ratio plus write-offs over the previous twelve months divided by the total loan portfolio plus write-offs over the previous twelve months.
2/ No public information is available on BACCs.
3/ Unlike last year when rating information was included to calculate the probability of default, this year only the method of moments was used due to its better statistical properties (see Box 10 of the 2006 Financial System Report).

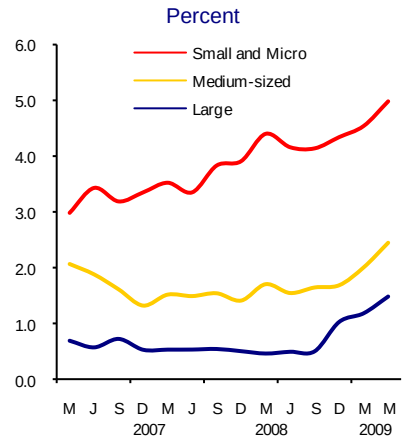
The delinquency and adjusted delinquency rates of the large and medium-sized banks have risen in recent months. However, they remain at relatively modest levels partly due to loan portfolio growth (Graph 67a and b). However, the fact there has been no significant deterioration in loan portfolios does not mean risks have not increased. The commercial loan portfolio has definitely become more vulnerable due both to an increase in default probabilities (Graph 67c) and correlations and greater concentration (Box 25).

The delinquency rate and default probabilities have significantly increased for companies of all sizes (Graph 68a and b).[35] Meanwhile, the default correlation has risen in the case of large and medium-sized firms. However, in the case of micro and small firms it has been more volatile (Graph 68c).

[35] The classification of commercial bank credit to non-financial private companies by size of firm is based on information provided by credit institutions to the National Banking and Securities Commission (CNBV) on a regular basis. This classification is established by the CNBV itself based on the number of employees in borrowing companies.

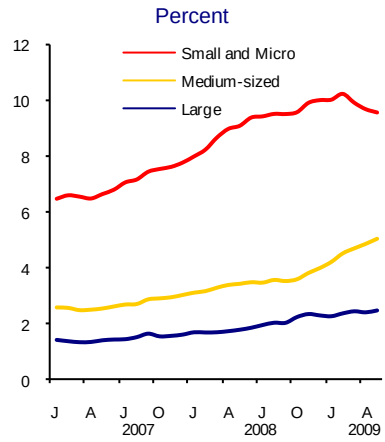
Graph 68
Commercial Bank Credit to Private Firms

a) Delinquency Rate by Size of Firm



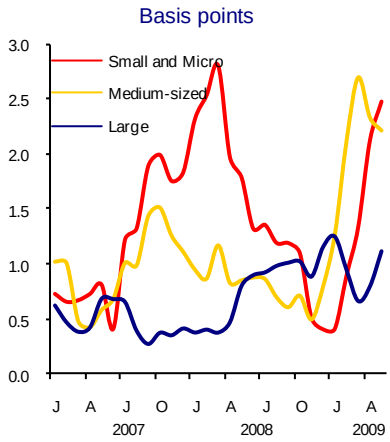
Figures as of May, 2009.
Source: Banco de México.

b) Probability of Default



Figures as of May, 2009.
Source: Banco de México.

c) Correlations by Company Type



Figures as of May, 2009.
Source: Banco de México.

Market risk

The current crisis has brought to light the serious limitations of most risk measurement models. It has also highlighted inconsistencies between accounting criteria and how financial institutions manage risk. The inadequacies of risk models become especially evident when extreme events, such as those related to the current crisis, materialize (Box 27).

Greater volatility in financial variables in the final months of 2008 resulted in a considerable increase in market risk,[36] measured using VaR (with a 99.9 percent confidence level)[37]. Graph 69a shows how in December 2008, market trading book VaR[38] as a percentage of regulatory capital sharply rose to 23 percent in the case of the six largest banks, 46 percent in the case of medium-sized banks and 50 percent in the case of SSFB.

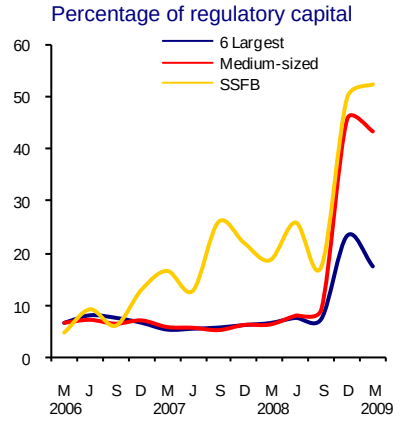
[36] Market risk consists of potential losses from variations in the value of financial assets owing to adverse movements or increases in the volatility of the financial variables which determine their price. The main financial variables are: interest rates with diverse maturities, the Mexican Stock Exchange Index (IPC) and the peso/US dollar exchange rate.

[37] Percentile 99.9 of the aforementioned distribution was calculated using Extreme Value Theory (Box 28) based on historical scenarios. The method consists of valuing the portfolio of assets and liabilities subject to market risk on the basis of a set of historical scenarios defined by daily variations in the value of risk factors; in other words, market variables which determine portfolio prices. A probability distribution of losses and gains over a 28-day period is obtained from the value of the portfólio in each historical scenario. These distributions are adjusted using a generalized Pareto distribution as of percentile 94. The historical scenarios are built using daily information on the behavior of risk factors between January 2001 and February 2008.

[38] The banking book corresponds to accounting records containing non-negotiable instruments; in other words, instruments the bank plans to hold until maturity. On the other hand, instruments in the trading books are negotiated in a market and valued on the basis of their performance in that market.

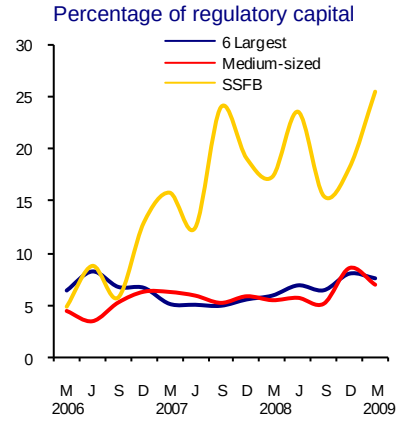
Graph 69
Market Risk

a) Trading Book VaR



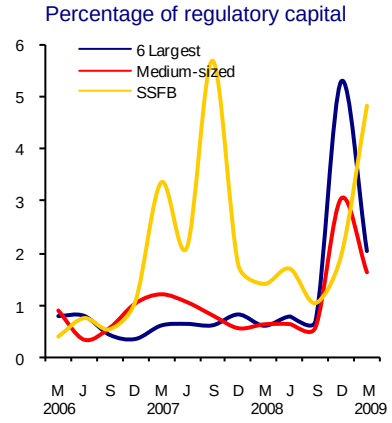
Figures as of March, 2009.
Source: Banco de México.
VaR was estimated using a confidence level of 99.9.

b) Combined VaR of the Trading Book and the Dollar-Denominated Assets and Liabilities of the Banking Book



Figures as of March, 2009.
Source: Banco de México

c) Difference Between CVaR and VaR of the Trading Book and the Dollar-Denominated Assets and Liabilities of the Banking Book



Figures as of March, 2009.
Source: Banco de México.

The results of Graph 69a can be traced to two factors: the first consists of the separation, for bookkeeping purposes, of the so-called banking and trading books. This division is not always congruent with the way a bank manages risk. Thus trading book positions may hedge banking book risks and vice versa, and so an estimate of VaR made solely on the basis of the trading book may over-estimate the bank's real risk. The second is related to the use of historical scenarios for estimating VaR. The emergence of a scenario of sudden changes in financial variables, such as the one which occurred in October 2008, causes increases in risk measurements.

The effect of accounting separation is diluted when VaR is calculated using the sum of trading book positions and dollar-denominated assets and liabilities in the banking book. As shown, the increase in risk as of October 2008 prevails (Graph 69b). However, its impact in relation to regulatory capital is much less when the effect of hedges is taken into account. In this case VaR values as a proportion of regulatory capital for December 2008 are 8.0 percent in the case of the six largest banks, 9.0 percent for the medium-sized banks and 18 percent for SSFB.

Furthermore, the Conditional Value at Risk or CVaR (Box 26) as a proportion of the regulatory capital surpassed by 5, 3 and 2 percentage points, respectively, its corresponding VaR in the same month. This implies that the loss distributions have heavier tails even when hedges are considered. Also, the use of historical scenarios makes VaR increase upon shock.

Box 25

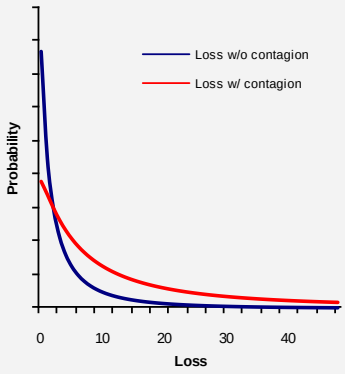
Inter-Company Contagion

Whether or not a company defaults on the payment of its credit obligations depends as much on factors inherent to the company—its management, debt levels, production and commercialization processes—as on external factors, like the economic cycle or the cost of raw materials. Historically, we have seen that when the climate in which these companies do business is less than favorable, more of them tend to default on their loans. Traditionally, this dynamics is included in risk models through default correlations, a measure that captures the dependence of the payment capacity of various debtors on common factors like their industry group or the general state of the economy.

Although this approach offers many advantages, some of the relationships between various companies could be veiled when captured implicitly in this type of model. One of these relationships is the possible contagion of one company's default to others with which it has a close commercial relationship, to such an extent that the failure of one can significantly affect the other's operation, leading eventually to its own bankruptcy.

To further explain this issue of inter-company contagion it will be assumed that a large company has more commercial relationships with other companies, so that its failure may induce a rise in the risk of companies that under normal conditions would be showing satisfactory performance. To analyze this relationship we used a single-risk factor model[1], similar to the one proposed by Vasicek (1987)[2], which assumes that a borrower will default on the payment of its obligations if the value of its assets drops below that of its liabilities.[3] However, unlike Vasicek's approach of using the limit distribution that a portfolio with a large number of loans would have, we used the distribution of losses obtained without this assumption instead.

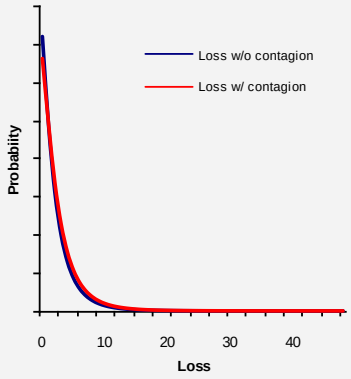
Graph 1
Distribution of Losses in an Industry Sffected by Contagion: Services



To detect whether default by major companies[4] induces default contagion in the rest of the portfolio, we need a risk measure that does not factor in this variable. We therefore divided the portfolio into six major sectors, depending on the companies' activities: agriculture and livestock, retailing, communications and transportation, construction, industry, and services. Each sector was in turn divided into two portfolios. The first groups together companies with lower credit risk, which have earned an investment grade rating.[5] The second included companies with lower credit quality, those rated "speculative grade".[6] This allows us to estimate loss distribution parameters omitting any type of contagion. The parameters obtained by this method correspond to default probability and the correlation of the assets in the portfolio, for both investment grade and speculative grade companies.

Once we have obtained the distribution of losses, we can model the contagion, assuming that the default rate of large companies (in other words, those that may induce contagion) can affect the performance of healthy companies (in this case, those with investment grade rating), regardless of the economic sector in which they operate. When adding this variable into the model, it is possible to obtain a distribution of losses that will depend on an additional parameter, which indicates the degree of contagion induced.

Graph 2
Distribution of Losses in an Industry Relatively Unaffected by Contagion: Construction



When this model was applied to the commercial loan portfolios of Mexican banks, it was found that the services, retail and communications and transportation sectors are the most vulnerable to contagion. Among these, service sector companies are the most sensitive of all (see Graph 1). On the other hand, construction, industry, agriculture and livestock have little sensitivity to possible contagion (see Graph 2).

These results are intuitive and reaffirm the notion that adequate performance in the tertiary sector depends largely on the strength of the primary and secondary sectors of the economy. For example, a large corporation in the industrial sector uses the services of a transportation company to distribute its products; it hires service sector companies to manage its accounting, advertising, and other activities that it requires to operate properly. Thus, the failure of such a company would also affect the performance of the companies functionally related to it.

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1. For more information on the model presented here, see Batiz, E., G. Christodoulakis and S. H. Poon (2009), "Estimating credit contagion under Non-normality", Working paper, Manchester Business School.
2. Vasicek, O., "Probability of Loss on a Loan Portfolio", Working paper, KMV, 1987.
3. This assumption is similar to the one developed in Merton, R. (1974) "On the Pricing of Corporate Debt: The Risk Structure of Interest Rates", Journal of Finance, 29: 449-470.
4. A company is considered a large corporation if it has more than 500 employees and operates in the industrial sector, or for companies in the services and retailing sectors, if it has more than 100 employees.
5. Investment grade ratings are those between the ranks of AAA and BBB-, using Standard & Poor's nomenclature.
6. Speculative grade includes ratings of between BB+ and D, using Standard and Poor's nomenclature.

Box 26

Coherent risk measures and Conditional VaR

Since the appearance, in 1997, of the article "*Thinking Coherently*"[1] risk professionals have been working to develop alternative risk measures to VaR. In that article, the authors prove that VaR is not, generally, a coherent risk measure because it provides no incentive for portfolio diversification.[2] The following is an explanation of what a risk measure is and the properties it must possess in order to be considered *coherent*.[3]

Risk Measure
A risk measure is a mapping from the set of all risks into the real numbers. The most common notation for a risk measure associated with the random variable X is $\rho(X)$. Mathematically, this is expressed as:

$$\rho(X) : G \rightarrow \mathbb{R}$$

Where:

X – Is the random variable that corresponds to the final value of a financial position or portfolio that takes securities according to possible states of nature.
Ω – Is the set of all possible states of nature or possible contingencies.
G – Is the set of all risks, in other words, the set of all the real functions of Ω. If Ω is finite, G can be identified with $\mathbb{R}^n$, where n = card(Ω).

Intuitively, a risk measure should distinguish between those scenarios that are acceptable, either for a regulator or for an investor, from those that are not. The four requisites that a risk measure must fulfill in order to be considered acceptable are:

Requisite 1: Invariant to translations

For all $X \in$ G and all $\alpha \in \mathbb{R}$ we have that

$$\rho(X + \alpha \cdot r) = \rho(X) - \alpha$$

where r represents risk-free asset. This requisite means that an increase (decrease) in a position of size α, invested in the risk-free asset in the initial portfolio reduces (increases) the measure of risk by α. This guarantees that if an investor holds a position in one instrument, it is possible to offset the risk of that position by investing an appropriate amount in a risk-free instrument. In other words, we have that for each $X \in$ G,

$$\rho(X + \rho(X) \cdot r) = 0$$

Requisite 2: Sub-additivity

For any $X_1, X_2 \in$ G we have that

$$\rho(X_1 + X_2) \leq \rho(X_1) + \rho(X_2)$$

This requisite is fulfilled through the principle of diversification, since an increase in the diversification of a portfolio shouldn't result in an increase in its risk. Thus, the risk of a portfolio that results from the sum of two portfolios should be less or equal than the risk of the two portfolios considered separately.

In general, VaR does not fulfill this requisite. To illustrate this point, we can cite the following example:

If we have two portfolios, portfolio A, which consists of a bond with a par value of 100 pesos and portfolio B, another bond with identical par value, and the likelihood that the issuer of the first bond will default in the next year is P(A) = 0.015, while the likelihood that the second issuer will default is P(B) = .04. It is easy to see that the VaR at 95% of both portfolios is:

$$VaR_{95}(A) = 0 \text{ y } VaR_{95}(B) = 0$$

Assuming the defaults are in both cases independent events and we build a new portfolio that includes both the previous two, then the VaR at 95% of the new portfolio would be:

$$VaR_{95}(A + B) = 100 *> VaR_{95}(A) + VaR_{95}(B) = 0$$

* Value at maturity.

So that the VaR at 95% of the combined portfolio is greater than the sum of VaR at 95% of the two portfolios. This demonstrates that VaR is not always a sub-additive measure.

Requisite 3: Positive homogeneity

For all $\lambda \geq 0$ and all $X \in$ G we have that:

$$\rho(\lambda X) = \lambda \rho(X)$$

Positive homogeneity means the risk on a position must be invariant with respect to the amount invested in it. Expressed in another way, the requisite is equivalent to requiring that:

$$\frac{\rho(\lambda X)}{\lambda} = \rho(X), \forall \lambda > 0 \text{ y } \rho(0) = 0$$

This property guarantees that the risk of a portfolio with 100 shares in a company is equal to 100 times the risk of maintaining a portfolio with only one share in that company.

Requisite 4: Monotony

For $X, Y \in$ G such that $X \leq Y$ we have that

$$\rho(X) \leq \rho(Y)$$

Monotony is required to reflect the preference of an investor or regulator, in the sense that if one portfolio or position is preferable to another, then the preferred one will have less risk than the non-preferred one.

Coherent Risk measure
A risk measures is said to be coherent if it fulfills the requirements of translation invariance, sub-additivity, positive homogeneity and monotony.
In particular, we can observe that any coherent risk measure is convex; in other words:

$$\rho(\lambda X + (1 - \lambda)Y) \leq \lambda \rho(X) + (1 - \lambda)\rho(Y) \text{ for } \lambda \in (0,1)$$

There is a fifth requisite that could be required of any coherent risk measures: relevance. What this means is that if an investor holds a short position in some instrument, it must involve some risk. Formally, this is expressed as follows:

Requisite 5: Relevance
For all $X \in$ G such that $X \leq 0$ and $X \neq 0$, we have that

$$\rho(X) > 0$$

Based on the definition of a coherent risk measure, measures have been sought that possess this quality. Conditional *VaR* or Expected Shortfall[4] is a measure that has been proven to meet all the above requirements.

Conditional *VaR*
Conditional VaR ($CVaR$) is a risk measure that allows us to estimate the expected value of the losses given that they have surpassed VaR (see Graph A). In addition to offering the advantage of coherence, $CVaR$ provides better information than the VaR about the tail behavior of a distribution of losses.

If the random variable X represents the possible losses on a portfolio, then the $CVaR$[5], at a level of confidence of 1-*q*, is formally defined as follows:

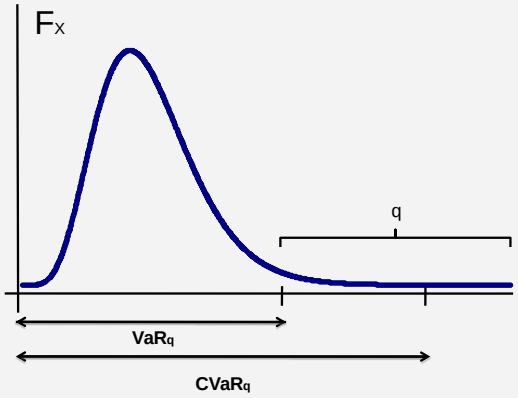
$$CVaR_q = E[X|X > VaR_q]$$

Thus, it is possible to calculate Conditional VaR based on a minimization problem:

$$CVaR_q = \min\left\{n + \frac{1}{q}E[(X - n)^+]\right\}$$

where the optimum n turns out to be the VaR.

Graph 1
Loss Distribution



Calculating *CVaR*

If the Loss distribution is continuous and belongs to a parametric family, then *CVaR* will be a parametric risk measure. For example, if the Loss distribution is described by means of a distribution function Gamma that depends on the parameters α (related to the distribution scale) and β (associated with form or dispersion), there is a closed formula for calculating *CVaR*:

$$CVaR_q = E[X] + \frac{1}{q}\left(\frac{V[X]}{E[X]} f_X(VaR_q)\right) VaR_q$$

Where:

X is the random variable that measures the losses,
q is the confidence level,
$V[X] = \frac{\alpha}{\beta^2}$ is the variance of losses,
$E[X] = \frac{\alpha}{\beta}$ is the expected value of the losses
f_X is the gamma density function,

If the loss distribution is associated to a lognormal distribution function with parameters μ and σ^2, then *CVaR* would be calculated as:

$$CVaR_q = \delta + \delta[(\Phi\left(\frac{\log(VaR_q) - \mu}{\sigma}\right) - \Phi\left(\frac{\log(VaR_q) - \mu}{\sigma} - \sigma\right)]\frac{1}{1 - \mathrm{F_X}(VaR_q)}$$

Where:

$\delta = e^{\mu+\sigma^2}$ is the expected value of the losses,
$\mathrm{F_X}$ is the lognormal cumulative distribution function,
Φ is the normal distribution function N(0,1).

If we consider a Loss distribution and gains whose behavior is that of a Normal distribution with parameters μ and σ^2 (losses have a positive sign), the expression of *CVaR* is reduced to:

$$CVaR_q = \mu + \frac{\sigma\phi(z_{1-q})}{1-q}$$

where the optimum n turns out to be the *VaR* and ϕ is the standard normal density function and z_{1-q} is the standard normal distribution quantile corresponding to level $1-q$.

For cases in which the Loss distribution shows discontinuities (an empirical distribution, for example), the Conditional *VaR* can be estimated by a convex linear combination between *VaR* and conditional expectation; in other words,

$$CVaR_q = \lambda_q VaR_q + (1-\lambda_q)E[X|X > VaR_q],$$

where:

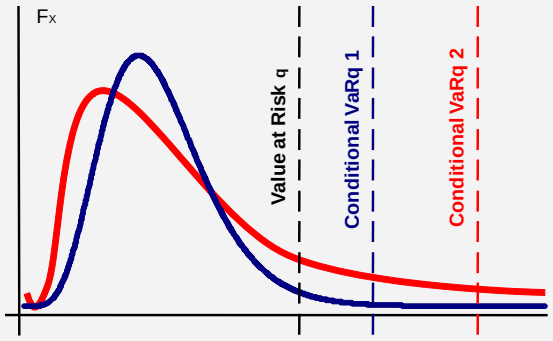
$$\lambda_q = \frac{F_X(VaR_q) + q - 1}{q}.$$

F_X is the cumulative distribution function of the losses. Note that if the Loss distribution is continuous then $F_X(VaR_q) + q - 1 = 0$ and therefore, we obtain the original equation for calculating *CVaR*.

The importance of a risk measure like the one explained here can be better appreciated when we have a Loss distribution with a heavy tail. The distance between *VaR* and *CVaR* increases substantially as the probability accumulates in the tail of the distribution.

CVaR is also more useful to compare the loss distribution between two or more portfolios. It is possible for two entities to present the same *VaR*, but having a substantially different *CVaR* (see Graph B). This clearly indicates that using only *VaR* as a form of contrast may lead to serious errors.

Graph 2
Loss Distribution



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1. Artzner, P., D. Delbaen, J. Eber and H. Heath (1997), "Thinking Coherently", Risk.
2. Other disadvantages of VaR can be seen in the 2007 Financial System Report
3. Artzner, P., D. Delbaen, J. Eber and H. Heath (1998), "Coherent measures of Risk".
4. Acerbi, C. and D. Tasche (2001), "Expected Shortfall: a natural coherent alternative to Value at Risk".
5. Rockafellar, R. and S. Uryasev (1999), "Optimization of Conditional Value-at-Risk".

Box 27

Why the Risk Models Failed

Models for measuring and managing risk have become increasingly popular since the 1990s. They have been driven by technological advances, greater availability of information, the wide number of models that exist, the increase in the number of people trained to use them, and the growing complexity and globalization of financial transactions. As a result, risk managers have placed an increasing amount of confidence in their models.

Adding to this is the fact that the authorities have encouraged the application of these models. This in turn has encouraged the creation of risk management areas, formerly included in research areas but without the technical sophistication found today. In recent years, however, risk assessment models have shown their limitations, especially in times of crisis. The disadvantages of some models arise from the assumptions on which their estimates are based, their theoretical foundations, which to a large extent lack predictive power, and the poor practices of risk managers. We can identify two main problems with the assumptions used to estimate models. The first stems from the use of data observed in stable periods to project the behavior of risk in times of crisis or high volatility. Abrupt movements and volatility of financial variables in times of crisis bear no relationship to the characteristic volatility of more stable periods. Risk models fed by stable historical series cannot capture the possibility of abrupt changes.

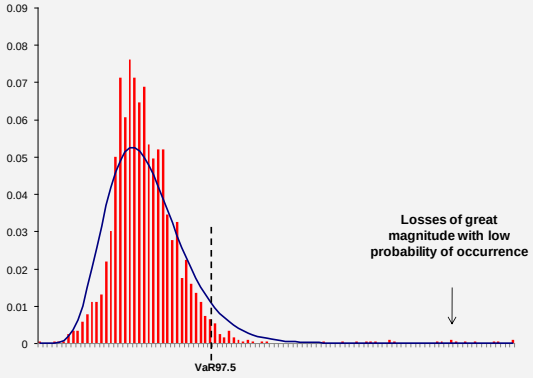
As an example, in the calculation of VaR, the parameters used to measure risk in an extreme scenario are different from the parameters used in periods of stability. VaR is useful for measuring losses that occur frequently, but is not very effective in cases of severe losses with low frequency, like those on the tail of a distribution of losses.

The second problem with risk models arises from the assumption that market prices follow a stochastic process which only is dependent on itself. Implicitly, this practice means decisions made by market participants do not depend on the model. This is not accurate, however, because most economic agents use those models to determine their strategies, a fact that has, paradoxically, led to an increase in price volatility, which worsens scenarios of crisis.[1] If economic agents use risk models as the basis for decisions, but at the same time doubt their reliability, there is clearly a discrepancy in the information to which the market responds and has access.

Another limitation of risk models is their inability to capture systemic risk. For the calculation of VaR, each institution is an agent whose actions do not affect the market, and is not affected by the actions of other institutions; but this is not actually the case. Furthermore, the models do not account for the creation of cycles produced by interactions between institutions, which depending on the type of market may reinforce each other, and may attain a relatively greater weight. Therefore, VaR is not a far-sighted measure; it is "procyclical." This characteristic may lead to excessive risk-taking when the economy expands, and risk aversion when it contracts.[2] The limitations of risk models have not been the only reasons for errors in risk management; poor practices can considerably intensify them. This was one of the main reasons for the subprime mortgage crisis, which was caused, among other factors, by the rise in securitizations. The ability to originate credits that could be quickly sold to special-purpose vehicles created perverse incentives for originators. This is because when the loan is securitized, its originator completely transfers its risk to the investor. Thus, there is no incentive to verify information of the original borrower. The final investors can only verify aggregate information on the borrowers, like the credit rating of the issue, or the collateral security margin on the loans included in it. This fact leads to the underestimation of the default probabilities.[3] Another poor risk management practice is the manipulation of the results of risk models in order to report supposedly low risk thresholds within a financial institution.

This is because firms often give bonuses to managers that obtain greater gains with lower risk. One example of this practice is the acquisition of financial products with "asymmetrical risk" (see Graph 1), like credit derivatives, which generate small profits but rarely generate losses. The problem is that when the losses do materialize, they are substantial, and since this is an event located on the tail of the distribution, it is often overlooked. As a result, it is possible to report a relatively low value-at-risk (VaR) and thus "hide" the greater losses in the tail of the distribution.

Graph 1
Profit and Loss Distribution of a Portfolio



In 2008, the consulting firm KPMG conducted a survey of risk managers in the world's largest banks in order to detect the weaknesses in risk management that contributed to the crisis. The survey revealed that 92 percent of executives interviewed said that they had taken measures or measures had been taken to review their companies' risk management practices.[4] The survey also revealed several of the practices that characterize poor risk management in larger banks which triggered many events that might have been prevented. The lack of a risk culture both within and outside the board of directors of many banks, made it impossible to react properly to unexpected events. At the same time, the survey confirmed that the mismatch between the objectives of the corporate treasury, the risk management process, and the board of directors, creates distortions and hampers risk planning.[5] The main conclusion of the survey is that firms should employ a holistic view of risk management, with clear objectives.

Finally, we must be aware that risk models are a useful and necessary tool, but they are not sufficient. Historical data cannot be used mechanically in conjunction with risk models to determine acceptable risk levels. In the field of risk management, it is important to complement the application of these models and their respective results with expert judgment, a fact that most risk managers apparently forgot in the recent past.[6]

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1. Danielsson, J. (2000), "The Emperor has no Clothes: Limits to Risk Modelling".
2. Finger, C. (2009), "VaR is From Mars, Capital is From Venus", RiskMetrics.
3. Rajan, U., A. Seru, and V. Vig (2008), "The Failure of Models That Predict Failure: Distance, Incentives and Defaults".
4. KPMG (2009), "Never Again? Risk Management in Banking Beyond the Credit Crisis". October 2008 survey.
5. Observations on Risk Management Practices during the Recent Market Turbulence (2008), Senior Supervisors Group.
6. Hull, J.C. (2008), "The Credit Crunch of 2007: What Went Wrong? Why? What Lessons Can Be Learned?".

Box 28

Extreme Value Theory

In the field of risk management, it is highly important to know the extremes or "tails" of the loss distribution. When the loss distribution is parametric, the tails are relatively easy to obtain. However, parametric distributions are available in very few occasions, for that reason it is common to use methodologies like historical simulation to approximate the loss distribution and to estimate the VaR based on the values obtained from the simulation. One limitation of this methodology is that if one wants to calculate the VaR for high confidence levels like 99, 99.9, or 99.95 percent,[1] the estimator has very high variance, because the amount of data may not be enough to approximate with precision the tail of the loss distribution.

Extreme Value Theory (EVT) provides a statistical tool for quantifying the probabilistic behavior of a portfolio, particularly in those rare events that produce large losses. There are two types of models: parametric and non-parametric. The most popular are parametric models, built on the basis of a fundamental theorem of the extreme value theory proved by Gnedenko (1943)[2]. This theorem demonstrates that the properties of the tail are similar for a large class of probability distributions.

Further down here is shown the analytical procedure based on the EVT that enables us to obtain an expression for the calculation of the VaR when the required confidence level is very high. To this end, we will assume that the losses on which we need to calculate the VaR are represented by a random variable *X*, with a cumulative distribution function *F*. Thus, let *u* be a value found in the tail that we want to model; the excess distribution above the threshold *u* is defined as follows:

$$F_u(y) = P(X - u \leq y | X > u).$$

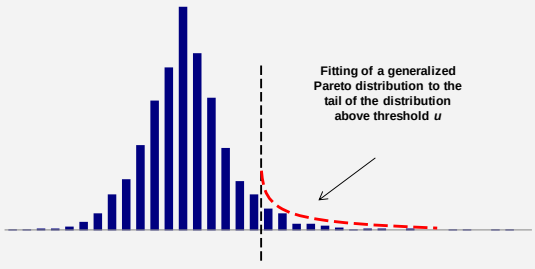
This distribution represents the probabillity that a loss will exceed the threshold *u* by an amount no greater than *y*. The excess distribution above the threshold *u* satisfies the following equality:

$$F_u(y) = \frac{F(y+u) - F(u)}{1 - F(u)}.$$

One of the main results proven by Gnedenko is that for a large class of distributions, among which are normal, lognormal, Student's t, gamma, beta, and others, the excess distribution $F_u(y)$ converges to a generalized Pareto distribution (GPD) as the threshold *u* increases (Graph 1). The GPD has the following expression:

$$G_{\xi,\beta}(y) = 1 - \left(1 + \xi \frac{y}{\beta}\right)^{-1/\xi}.$$

Graph 1



This distribution contains two parameters, which are estimated on the basis of a sample of observed data. Parameter ξ, known as the shape parameter, is related to the speed of decay of the distribution's tail, and parameter β, known as the scale parameter, is related to the position of the threshold *u*.

If we substitute $F_u(y)$ for $G_{\xi,\beta}(y)$ and set x = u + y, we obtain:

$$F(x) = (1 - F(u))G_{\xi,\beta}(x - u) + F(u)$$

for x > u. When we use a historical simulation and define n as the total number of simulated values and Nu as the total number of observations above threshold *u*, it is possible to calculate F(*u*) using the empirical estimator. Thus, 1-*F*(*u*) can be estimated by $\frac{n-N_u}{n}$. The parameters ξ and β of the GPD can be estimated by using the maximum-likelihood method.

Using these assumptions, the distribution function *F*, for values above threshold *u*, can be approximated in the following way:

$$\hat{F}(x) = 1 - \frac{N_u}{n}\left(1 + \hat{\xi}\frac{x-u}{\hat{\beta}}\right)^{-\frac{1}{\hat{\xi}}}.$$

From this equation, we can obtain an approximation of the VaR at a confidence level q, using the following expression:

$$\widehat{VaR}_q = u + \frac{\hat{\beta}}{\hat{\xi}}\left[\left(\frac{n}{N_u}(1-q)\right)^{-\hat{\xi}} - 1\right].$$

Another measure that is easier to calculate using the EVT is the expected shortfall (ES). This metric is defined as:

$$ES_q = E[X | X > VaR_q].$$

In other words, the expected shortfall related to the VaR for a given confidence level *q* is the expected loss, given that VaR_q was exceeded. ES_q is related to the VaR_q through the following expression:

$$ES_q = VaR_q + E[X - VaR_q | X > VaR_q].$$

Since one of the properties of the model we are using is that if we take a threshold above *u*, like VaR_q for $q > F(u)$, the excess distribution above this threshold is also generalized Pareto, with the same shape parameter, but different scale, so we have:

$$F_{VaR_q}(y) = G_{\xi,\beta+(VaR_q-u)}(y).$$

Thus, the mean of this distribution is $\frac{\beta+\xi(VaR_q-u)}{1-\xi}$, and so in the context of EVT, the expected shortfall at the given confidence level *q* is estimated by the expression:

$$\widehat{ES}_q = \frac{\widehat{VaR}_q}{1-\xi} + \frac{\hat{\beta} - \hat{\xi}u}{1-\xi}.$$

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1. The Basel II committee recommends calculating VaR at a confidence level of 99.9%.
2. Gnedenko, B.V. (1943). "*Sur la distribution limite du terme d'une série aléatoire*". Annals of Mathematics 44, pp. 423-453.

Market and credit risk

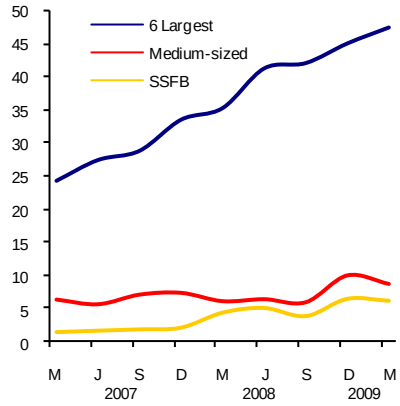
The system's total VaR,[39] considering potential losses arising from both market risk and credit risk, rose by 35 percent in real terms between the end of 2007 and 2008 (Graph 70a). This figure is similar to the previous year's increase but stems from lower loan portfolio growth. By group of banks the biggest increase was at the SSFB (172 percent), while in the case of the largest and medium-sized banks the increases were 26 and 27 percent, respectively. VaR as a proportion of regulatory capital rose by 22 percent for the system (Graph 70b).

The exercise below calculates the credit and market loss distribution of each bank. It takes into account simultaneous losses at the banks analyzed and so results are not comparable with those presented in the risk contagion section.

Graph 70
Total Value at Risk

a) Market and Credit VaR

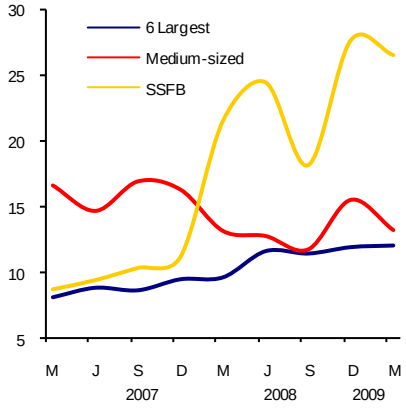
Billion pesos



Figures as of March, 2009.
Source: Banco de México.
VaR estimated using a confidence level of 99.9 percent
1/ Spread between December 2007 and December 2008 .

b) Market and Credit VaR

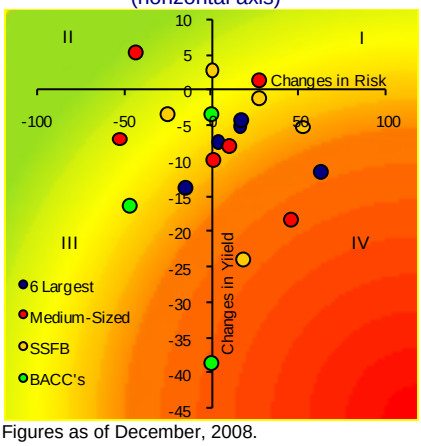
Percentage of regulatory capital



Figures as of March, 2009.
Source: Banco de México.

c) Risk Versus Profitability

Percentage variation in ROE (vertical axis)
Percentage change in VaR/regulatory capital (horizontal axis)[1/]



Figures as of December, 2008.
Source: Banco de México.

Increased risk has gone hand in hand with lower profitability levels in most banks. Graph 70c compares variations in the risk level[40] with changes in profitability.[41] Two thirds of banks for wich it was possible to build this indicator for are in the fourth quadrant, indicating greater risk and lower profitability.

For all groups of banks both VaR and CVaR rose during 2008 (Graph 71a and b). SSFBs registered a considerable increase in the difference between CVaR and VaR during this period (Graph 71c).

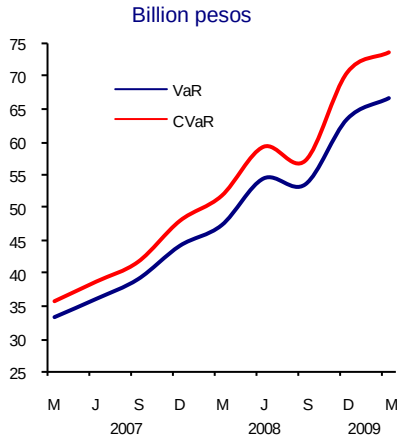
[39] Box 28 of the 2007 Financial System Report describes the procedure for adding market and credit risks to total VaR calculations. The negotiable part of the dollar-denominated trading book was included in these calculations in order to more accurately estimate the risks and not introduce an accounting classification bias.

[40] The risk level is the year-on-year change in the VaR ratio divided by December 2008 net capital.

[41] The profitability level is the year-on-year change in December 2008 ROE.

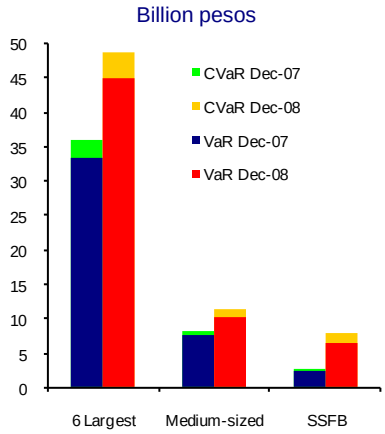
Graph 71
Total Value at Risk

a) Comparison of Total VaR and Total CVaR



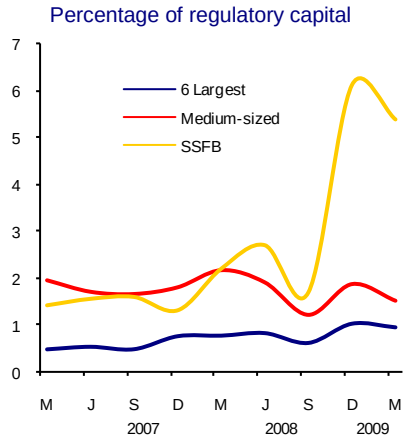
Figures as of March, 2009.
Source: Banco de México.

b) Total VaR and Total CVaR



Figures as of December, 2008.
Source: Banco de México.

c) Difference Between CVaR and Total VaR



Figures as of March, 2009.
Source: Banco de México.

Stress Tests

Stress tests entail subjecting a loan portfolio, institution or group of institutions to extremely difficult conditions that have a greater than zero probability of occurrence. They constitute an additional risk management tool for banks, and a practice encouraged by authorities under the Basel II regulatory framework. Stress tests are important for the following reasons: i) they provide a prospective assessment on risk; ii) they transcend the limitations of historical data and models; iii) they support capital planning procedures and liquidity; iv) they provide information on a bank's risk tolerance; and v) facilitate the development of contingency plans based on diverse stress conditions.

The design of stress scenarios is very relevant to the final results of such tests.[42] If a stress test is undertaken based on a very extreme scenario but with a probability of occurrence close to zero, the exercise is irrelevant. On the other hand, if the scenario being assessed has a high probability of occurrence but its degree of severity is not enough to be considered stress, it also has no value. The aim of designing a stress scenario is that it meets conditions associated with an event with a high degree of severity with a probability of occurrence greater than zero.

Thus, aspects which cause the greatest vulnerability in the financial system should be identified and considered when designing the stress scenario.[43]

[42] Box 12 of the 2006 Financial System Report discusses the options and difficulties in building stress scenarios.

[43] For example, a stress scenario which replicates the conditions of the 1995 crisis would be severe but not plausible in terms of its probability of occurrence. There are several structural factors which are entirely different today, such as the exchange rate regime. Probably the most important difference lies precisely in the implications and effects exchange rate adjustments had then compared to today (Box 19).

Market Stress Tests

In order to undertake market stress tests trading book positions were added to the foreign currency assets and liabilities of the banking book in an extreme scenario. The scenario assesses losses to trading book positions in the event of an 11 percent appreciation in the exchange rate, a 15 percent drop in the IPC and a 60 percent increase in all nodes on the interest rate curve (Graph 72a).

The banks which recorded the biggest losses, and therefore had a lower ICAP (capital adequacy index), were those which were long in instruments sensitive to interest-rate risk, long in the stock market index and short in dollars. However, no bank group recorded an ICAP below 8 percent.

Credit Stress Tests[44]

In the credit stress test presented in this Report, potential losses for banks were estimated in the event of an increase in borrower loan defaults. A scenario was built in which the probability of default was increased linearly over a three-year time horizon. Probabilities of default tripled half way through the stress period thereafter decreasing to their original level by the end of the period.

In order to estimate the impact of projected losses during the stress period, an ICAP for the scenario was calculated on the assumption of variations in capital being due only and exclusively to changes in the loan portfolio.[45]

[44] Box 29 of the 2007 Financial Report details the methodology used to obtain credit stress test results.

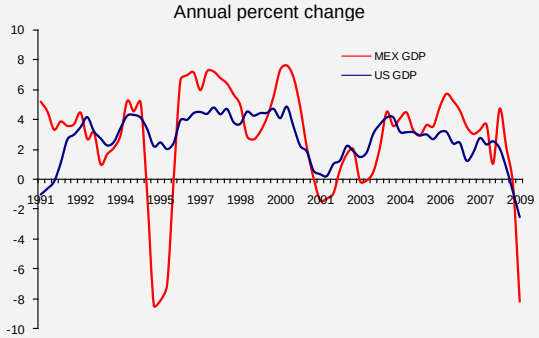
[45] This assumes that the loan portfolio is not amortized and therefore changes are due only to expected losses (considering possible loan recoveries) and accrued interest. The details of these assumptions and the respective calculations can be found in Box 29 of the 2007 Financial System Report.

Box 29

A Tale of Two Crises: 1995 and 2008

For many of us, the contraction in Mexican economic activity early in 2009, which was much more severe than anticipated, brought to mind the 1995 crisis. In order to identify similarities and differences, the graph below shows the levels reached by some economic and financial indicators in the months before and after each crisis peaked..[1] Although the intensity of both crises seems to be similar, their nature is completely different (see Graph 1).

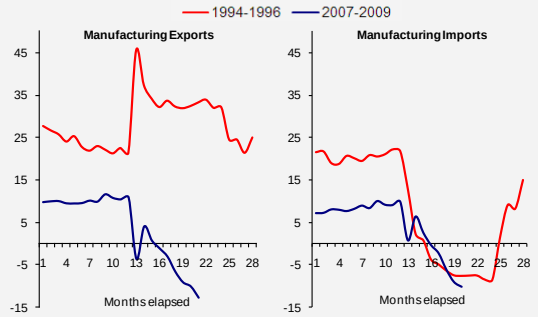
Graph 1: GDP in Mexico and United States
Annual percent change



Data as of first quarter 2009. Source: INEGI and BEA.

The first difference that springs to mind between the two crises can be seen in several variables relating to the country's external accounts. In 1995, Mexico had a semi-fixed exchange rate regime (flotation within exchange-rate bands), while by 2007 the exchange rate regime was completely free-floating. More importantly, in 1994 the current account deficit amounted to seven percent of GDP, while in 2007 it was barely above one percent.

Graph 2: Mexican Manufacturing Exports and Imports
Annual percent change



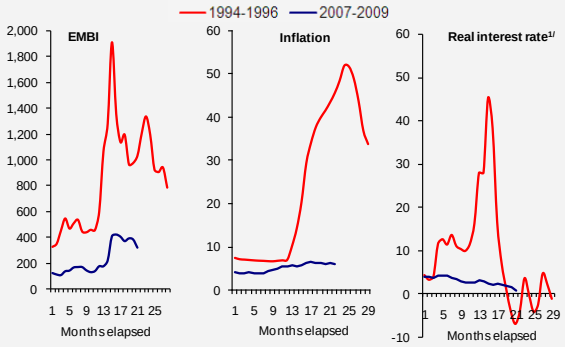
Data as of first quarter 2009. Changes constructed based on annualized series. Source: INEGI.

These factors made the real depreciation of the exchange rate much greater in 1995 than in 2008. This, combined with the fact that the U.S. economy was booming in 1996, and in recession in 2009, caused Mexican manufacturing exports to expand rapidly in 1995 offsetting the decline in domestic demand, while the story during the 2008 crisis was completely the opposite (see Graph 2). Currently, the plunge in Mexican manufacturing exports has reduced industrial output and formal employment, driving down domestic demand, which in turn has affected the service sector.

Another crucial difference between the 1995 and 2008 crises lies in the strength of the Mexican economy and solidity of its financial system. In 1995, inflation shot up to more than 52 percent, but in the current crisis it stayed well within one-digit levels (see Graph 3). In 1995 the banking system was in crisis, but today, Mexico's banks are well capitalized, adequately provisioned and, despite the crisis, they continue lending money to local companies. Furthermore, their coverage and capital adequacy ratios exceed regulatory requirements, and even hold up well in international comparisons.

Furthermore, although delinquency rates have risen in three chief areas of the credit market (consumer credit, mortgages and commercial or business loans) in part as a natural result of the crisis, they are minimal compared to those recorded in the 1995 crisis (see Graph 4).

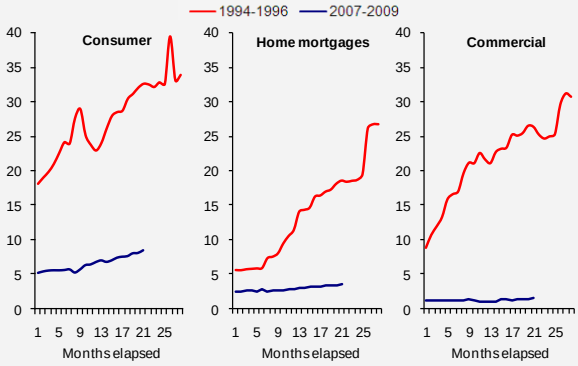
Graph 3: Country Risk, Real Interest Rate and Inflation
Basis points over U.S. Treasury Bonds (EMBI)
Percent (inflation and interest rate)



Data as of May 2009. Source: Bloomberg and Banco de México.
1/ "Ex post rate". It is calculated based on observed inflation.

One more substantive difference between the two crises has to do with the fiscal and monetary policies introduced by the authorities to deal with the situation. In the 1995 crisis, it was necessary to slash public spending and raise domestic savings to contain the spike in inflation. In 2008 there has been no need to adopt such drastic measures because the rest of the world is immersed in the same crisis. This allowed the authorities to apply an aggressive countercyclical fiscal policy, while Banco de México has been able to lower interest rates because inflation remains relatively low.

Graph 4: Delinquency Index[1] (IMOR) by Type of Portfolio
Percent



Data as of April 2009. Source: Banco de México.
1/ Past-due to total loans.

One of the factors that accelerated the recovery in 1995 was the vigor of the U.S. economy (an element that is absent in this crisis). Countercyclical measures can help curb the damages, but they cannot stand in for the entire drive normally provided by global economic activity. So even though the recession was intense in 1995, one year later the economy was once again growing at a brisk pace. In the current crisis, the recovery of economic activity and jobs may be a more gradual process, at a pace more in line with the recovery of the global economy.

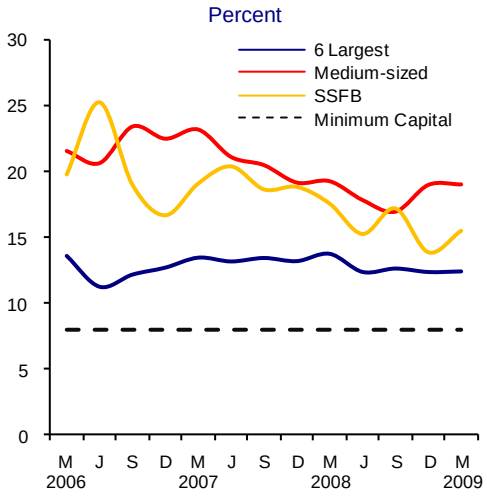
---

1. We considered the first month of the 1995 crisis to have been January 1994 (12 months before it peaked, in December 1994). For the 2008 crisis, we considered the first month to have been August 2007, when the French bank BPN Paribas announced the suspension of three mutual funds with assets related to U.S. subprime mortgages (13 months before the crisis reached its climax in September 2008).

The results of the stress scenario show a clear deterioration in the capitalization levels of the three bank groups. However, during the stress period ICAP does not fall below eight percent for any of the bank groups (Graph 72b). Decreases in the level of capitalization are bigger in the case of medium-sized and large banks, as the expected losses are considerably higher than revenue generated by interest on loans, especially commercial sector loans.

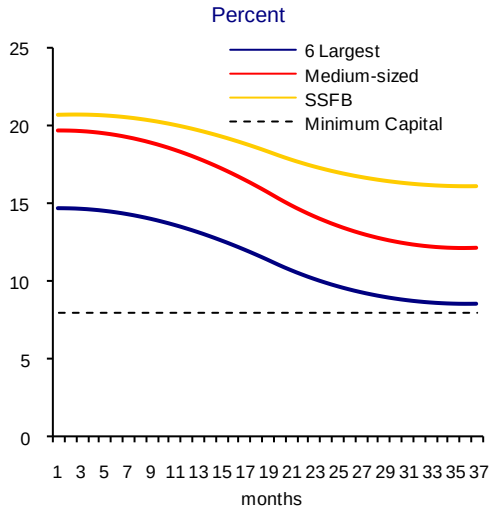
Graph 72
Stress Tests

a) ICAP After Applying Estimated Market Losses to the Market Stress Scenario



Figures as of March, 2009.
Source: Banco de México.

b) ICAP After Applying Estimated Credit Losses to the Triple Probability Scenario



Source: Banco de México.

Interbank market and risk contagion

The current crisis has highlighted the importance of liquidity conditions in interbank markets, which calls for their analysis along with an examination of the liquidity situation of the main players. The interbank market plays a key role in the economy's performance. Banco de México intervenes in this market to achieve its monetary policy operating target. Furthermore, given that under normal circumstances this market's funds can be tapped easily and quickly, the interbank market is extremely important to financial intermediaries in managing liquidity risk. Banks with excess liquidity use the interbank market to meet the needs of banks with a liquidity shortage. The sound working of the interbank market permits the efficient allocation of funds between banks and their specialization in different areas of business.

As of September 2007, there was a strong increase in interbank loans (Graph 73a). Growth in banking sector term deposits following withdrawals from Mutual Funds owing to market volatility (Graph 73b), is one explanation for this. Since the increase in funds obtained by banks with excess liquidity does not immediately translate into more financing for firms and households, such banks extended more interbank loans.

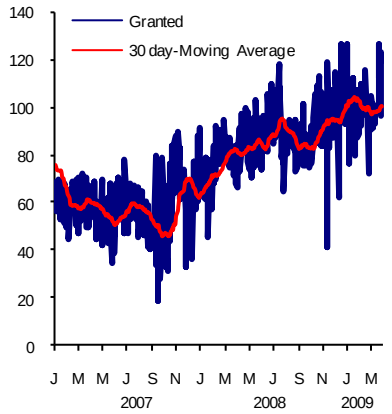
The increase in interbank loans was accompanied by a higher funding cost. The spread between the average interest rate on interbank market loans and

Banco de México's target rate rose to 40 basis points in November, 2008 (Graph 73c).

Graph 73
Interbank Market Indicators

a) Interbank Funding Balance[1/]

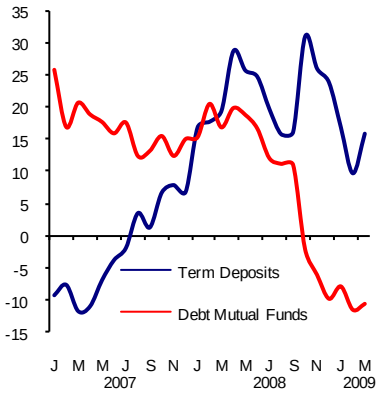
Billion pesos



Figures as of March, 2009.
Source: Banco de México.
1/ Includes loans, deposits and securities.

c) Trend in Bank Term Deposits and Debt Mutual Funds

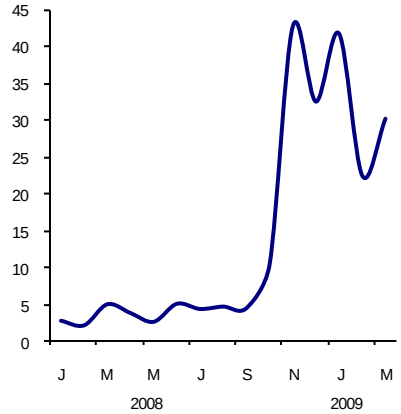
Real annual change in percent



Figures as of March, 2009.
Source: Banco de México

c) Spread between the Banking Paper Funding Rate and the Central Bank's Target Rate [2/]

Basis points



Figures as of March, 2009.
Source: Banco de México

2/ Weekly average weighted by issuance amount.

Risk positions generated by interbank markets can cause a contagion risk consisting of one bank's problems being directly transferred to others through these markets. Graph 74a shows average bilateral interbank exposure for a group of banks as a percentage of regulatory capital. The risk positions of medium-sized banks and SSFBs increased during some months of 2008 while the risk positions of BACCs increased as of 2009.

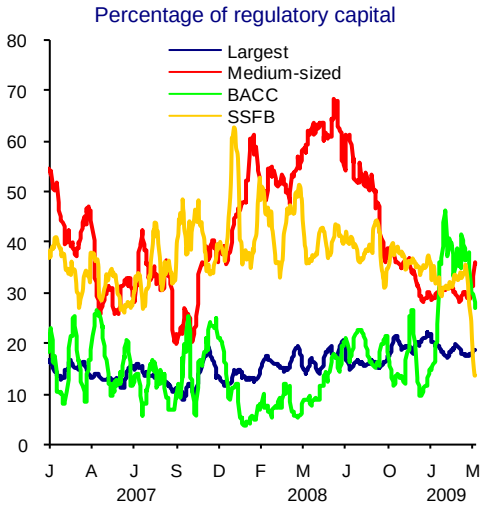
One way of assessing the size of contagion risk is using the simulation method explained in previous Financial System Reports.[46] Interbank risk positions comprise interbank funding transactions and currency and derivative transactions (Graph 74b). It should be noted that the payment risk in foreign exchange transactions considerably decreased as of June 2008 following the peso's inclusion in the *Continuous Linked Settlement Bank.*[47]

[46] The methodology and assumptions used are explained in the 2006 Financial System Report.

[47] See the Payment Systems section of this report and Box 32 of the 2007 Financial System Report.

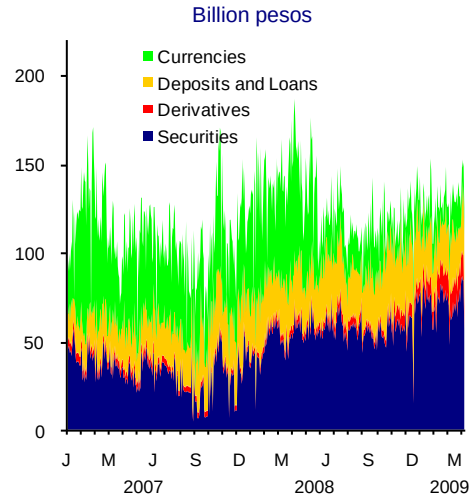
Graph 74
Interbank Risk Positions

a) Bilateral Interbank Risk Positions[1/]



Figures as of March, 2009.
Source: Banco de México.

b) Daily Value of Interbank Risk Positions



Figures as of March, 2009.
Source: Banco de México.

1/ Bilateral interbank risk positions are the sum of daily unsecured loans between banks.

The results of the simulation show that during 2008 and the first quarter of 2009, the number of banks with a potential ICAP below eight percent (Graph 75a) increased slightly, while the number of banks with an ICAP below four percent remained relatively small (Graph 75b). In the case of medium-sized banks, SSFBs and BACCs, this can be attributed to the increase in above-mentioned interbank risk positions as a percentage of regulatory capital.

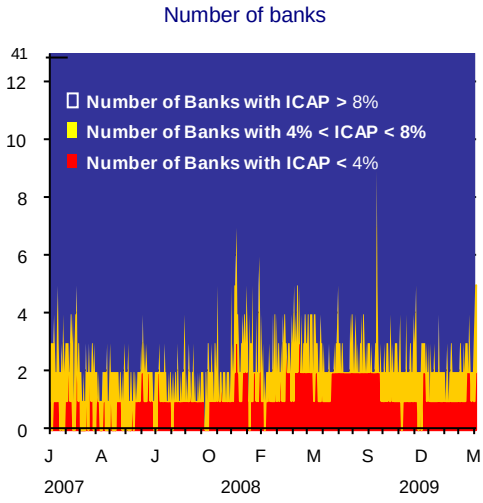
In the absence of measures for diversifying interbank exposures, these banks must be prepared to implement timely corrective actions to prevent their liquidity and solvency from being seriously affected. The results indicate that the interbank market has weathered external and internal shocks and has contributed to mitigating their negative effects on the financial system.

Furthermore, they suggest that the risk of contagion did not significantly increase during the current crisis. However, it should be borne in mind that to assess contagion risk the exercise assumes that any bank can present an individual problem with the potential to take ICAP below four percent, stop payments and thus generate an interbank contagion[48]. This in turn assumes that other banks are not affected by the financial difficulties besetting the bank which initially presents problems, and can only be contaminated via risk positions with it.

[48] It should be borne in mind that other reasons, such as liquidity problems, could result in a bank stopping payments.

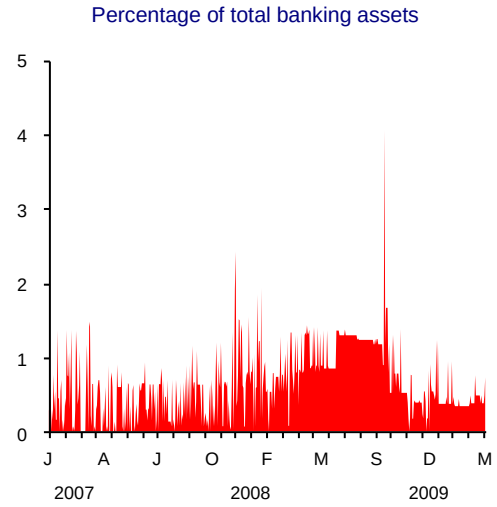
Graph 75
Main Results of Contagion Effect Calculation[1/]

a) Capital Adequacy Indexes Arising from a Worst Chain of Contagion Occurring Daily



Figures as of March, 2009.
Source: Banco de México.

b) Assets of Banks whose Capital would be Lower than 4 percent in the Event of a Worst Chain of Contagion Occurring Daily



Figures as of March, 2009.
Source: Banco de México.

1/ Assumptions: Loss given a 100 percent default and 4 percent ICAP.

Likewise, it should be emphasized that it is not possible to precisely predict all of the mechanisms of contagion, since as we have seen during the recent crisis, factors which are not easy to quantify, such as uncertainty, and difficulties obtaining information from different markets, can lead financial problems to spread quickly and unexpectedly among banks with similar characteristics. In an attempt to provide a balanced assessment of the risks facing banks, the next section combines the different analyses presented in this chapter.

Combined analysis of credit, market and contagion risks

This section presents an exercise based on the combined loss distribution of Mexican banks derived from market, credit and interbank contagion risks.[49] Unlike the methodologies used in previous sections, which measure the credit and market risks of banks individually and independently, the combined distribution incorporates losses banks could incur simultaneously.

To obtain the banking system's loss distribution, combined distributions of credit and market risk losses were created for each month between January 2008 and January 2009.[50] Based on that data combined losses for the system were simulated[51] and loss distributions for each month were obtained. Finally,

[49] The exercises only include 27 of the 43 banks which currently are part of the system, as the other banks are new players with not enough information on which to estimate the parameters required for this exercise.

[50] See Box 28 of the 2007 Financial System Report.

[51] A normal copula was used for this purpose. The variance-covariance matrix for the normal copula is based on changes in the net interest income and trading results of banks. For example, see: Cech (2006) "*Copula-based top-down approaches in financial risk aggregation*." Working Paper 32, University of Applied Sciences of Vienna.

based on the result of the loss distribution the contagion risk corresponding to each point of the distribution was assessed.[52] Under the assumptions used, contagion will take place whenever the bankruptcy of one bank takes the ICAP of another bank below the pre-set level. Once contagion chains are obtained, banking system distribution losses are incorporated to obtain loss distribution including contagion risk (Box 30).

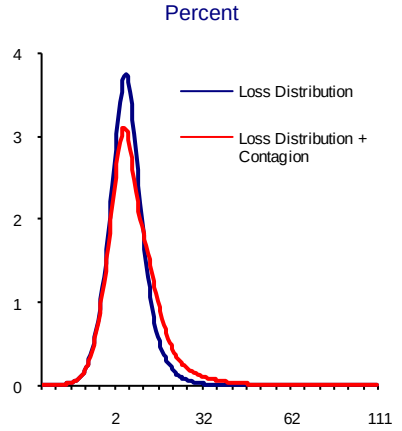
Banking system loss distributions (including contagion losses) permit an analysis and study of losses derived from daily operations, their quantification and probability of occurrence as well as increases in the system's total risk. The methodology used provides insight into losses before and after the contagion process. The distribution of banking system losses was modified to include contagion results; in particular, the weight of the middle part of the distribution increased and there was a slight increase in the right tail (Graph 76a). The contagion effect on loss distribution varies significantly over time due to changes in interbank exposure (Graph 76b and c).

The contagion risk derived from simulated losses during 2008 and through January 2009 with a bankruptcy threshold corresponding to an ICAP below 4 percent was virtually non-existent (Graph 77a). However, and as previously emphasized, since the end of 2008 the system's risk has grown. In November 2008, CVaR represented 10.1 percent of the banking system's regulatory capital. But using a stricter bankruptcy threshold, an ICAP below eight percent for example, the contagion risk increases (Graph 77b). For example, in November 2008, the CVaR to regulatory capital ratio rose by one percent including contagion-induced losses. This means that besides an increase in system risk, the risk of contagion-induced losses in the interbank market also increases. However, by January 2009 the contagion effect had virtually disappeared.

[52] As shown in the 2006 and 2007 Financial System Reports, inter-bank exposures vary significantly over time and so in order to assess the direct effects of a worst-case contagion scenario on the system's loss distribution, the interbank exposure matrix that would generate the worst chain of contagion during the month was selected. If said matrix is found during the first fifteen days of the month, assets subject to risk values and the net capital of the immediately preceding month are used, or else the corresponding month's closing data.

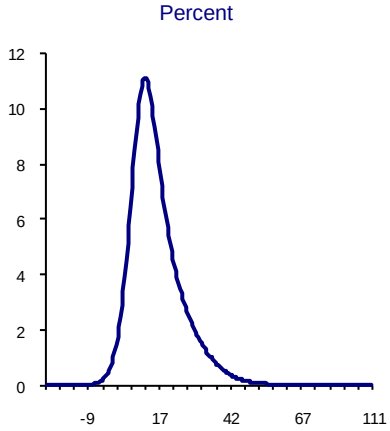
Graph 76

a) Loss Distribution in Billions Pesos of August 2008



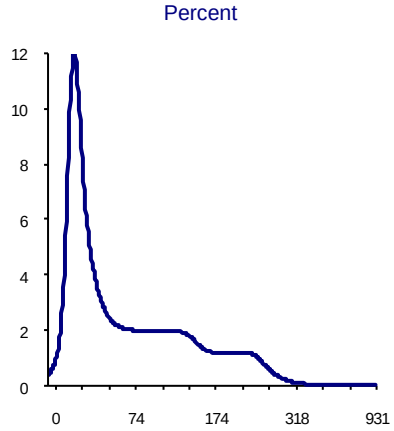
Source: Banco de México.

b) Increase in Loss Distribution Due to the August 2008 Contagion



Source: Banco de México

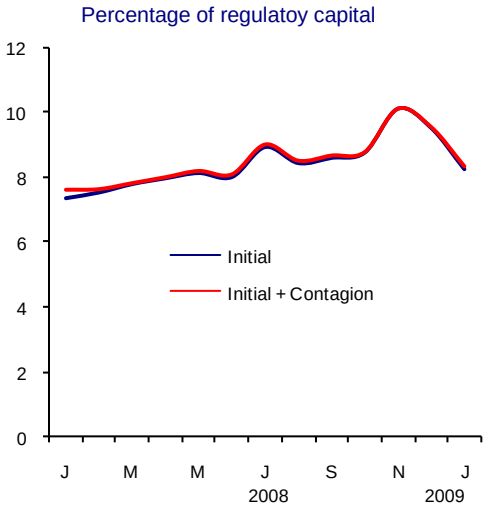
c) Increase in Loss Distribution Due to the October 2008 Contagion



Source: Banco de México.

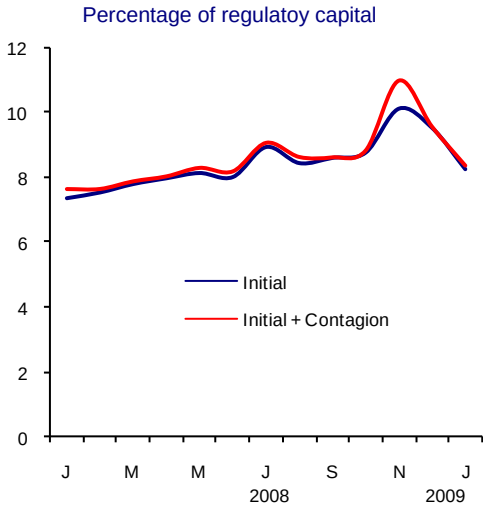
Graph 77
Financial System Risk Indicators

a) 99.9% CVaR, Contagion with an ICAP Below 4%



Figures as of January, 2009.
Source: Banco de México.

b) 99.9% CVaR, Contagion with an ICAP Below 8%



Figures as of January, 2009.
Source: Banco de México

Box 30

Joint Bank Losses and Contagion Model

The estimation of the distribution of joint losses for the banking system can be modelled in two phases: the initial shock, which brings losses and possibly causes the failure of one or more banks, and the contagion process, which could cause additional failures of other banks in the system.

The joint losses model allows us to estimate losses in the banking system resulting from declines in banks' capital adequacy ratios, either because of an initial stochastic shock, or during the contagion process.

The model consists of a network, which is represented by a directed graph $G[V,A]$, whose V nodes are segmented according to $V=\{s,S,R,t\}$; where: s is the node that represents the initial shock to the system; S is the set of nodes that represents banks that are the "source" of contagion to the system, given the initial shock; R is the set of the "relay" nodes which are banks in the possible contagion tree at the different N "stages" and t represents the sink node where all the losses caused by the crisis in the system accumulate.

The arcs "A" that join the network's nodes are "labeled" with different attributes. Thus, the arcs that go from the shock node "s" to the nodes representing banks that may be sources of contagion are labeled, given the initial shock, with the "l_i^0" of those banks. The arcs that go from two banks (i, j) within the network contagion segment are labeled with the exposure "d_{ij}" of bank "j" with bank "i". Finally, the arcs that go from a node "i" in the latest possible phase of contagion to the sink node, are labeled with the loss to the system. Schematically, this network is shown in Figure 1.

We shall assume that in each phase of contagion and for each bank i of the system there is a certain threshold u_i^k such that, if the bank's exposure to other banks whose capital adequacy ratio fell below 4 percent previously exceeds the threshold, the bank's capital adequacy ratio will also fall below 4 percent. Thus, formally, bank i would have a capital adequacy ratio below 4 percent in phase $k+1$ if:

$$\sum_{j\in D^{k-1}} d_{ji} \le u_i^k \quad and \quad \sum_{j\in D^k} d_{ji} > u_i^{k+1}$$

where D^k represents the set of all banks with a capital adequacy ratio below 4 percent until stage k.

One extremely important concept for studying financial contagion when there are interbank loans is that of "over-exposure". A bank i is said to be over-exposed when:

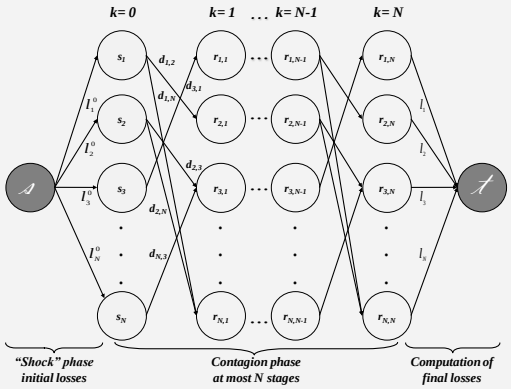
$$\sum_{j\in N^-(i)} d_{ji} > u_i^0$$

where $N^-(i)$ is the set of *inner neighbors* of bank i, in other words, banks "j" in the previous phase, which are linked to bank "i" through an arc labeled $d_{ij} > 0$.

For each bank, we define a status variable θ_i^k which indicates whether the capital adequacy ratio of a bank "i" has already fallen below 4 percent in stage "k":

$$\theta_i^k = \begin{cases} 1 \; if \; i \in D^k \\ 0 \; otherwise \end{cases}$$

Figure 1
Model of Joint Losses and Contagion



Distribution of losses

Let $l_1^0, l_2^0, \ldots, l_N^0$ be the losses caused by the initial shock. Let F be the set of banks whose capital adequacy ratio fell below 4 percent in the initial shock given G, the network of interbank exposures at the time of the shock. Because the process of contagion is deterministic, the set of banks whose capital adequacy ratio is below than 4 percent due to the contagion from the banks that initially fell below 4 percent is unique. Let $C(F,G)$ be the set of banks with a capital adequacy ratio of less than 4 percent due to the contagion if scenario F occurs, given G. Finally, let $L(F,G)$ be the loss if scenario F occurs with a network of exposures G. This loss is calculated as follows:

$$L(F,G) = \sum_{i=1}^{N} l_i^0 + \sum_{i=1}^{N} \sum_{j\in N^-(i)} d_{ji}\theta_j^N$$

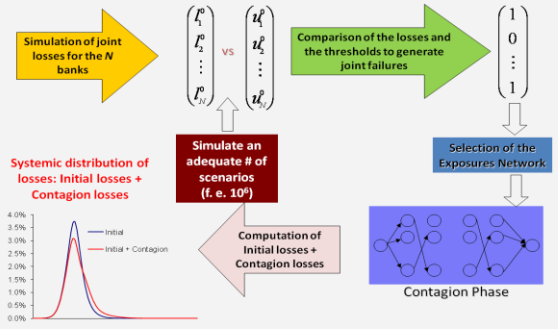
Alternately, it would be possible to define the total loss for the system in terms of loss variables, as follows:

$$L(F,G) = \sum_i l_i$$

where

$$l_i = l_i^0 + \sum_{j\in N^-(i)} d_{ji}\theta_j^N$$

Figure 2
Distribution Estimation Process



With the elements developed, we can now estimate the distribution of joint losses of the financial system. Figure 2 explains schematically the process carried out to estimate this distribution. This distribution includes the second-round effects (contagion) unleashed through the interbank loan market.

The distribution of losses estimated through the model proposed here incorporates the losses resulting from the initial shock and the propensity to contagion. To measure the impact on the system, a composite measure is proposed in the form of a risk indicator (conditional VaR, or CVaR) divided by net capital in the system CN ; specifically:

$$\mu = \frac{CVaR(\alpha)}{CN}$$

The inherent risk of the group of banks considered in the exercise estimated using CVaR, has risen in recent months and the contagion could increase the losses. However, in the worst-case scenario, CVaR measured on the basis of banks' regulatory capital accounts for just 11 percent considering a bankruptcy threshold of eight percent of ICAP. This implies that estimated losses from contagion are small.

Liquidity risk

The current crisis has once again highlighted the importance of adequate liquidity risk management. Box 31 provides some examples of banks in the United States and Europe which faced serious liquidity problems despite boasting capital adequacy ratios above the mandatory minimum. This demonstrates that business strategies and models that do not correctly factor in liquidity risk may be relatively more vulnerable to financial market developments.

Box 31

Grounds for Revocation of License for Default or "Illiquidity"

The recent global crisis revealed the importance of proper handling of liquidity. Even before the crisis, it was frequently believed that if a bank was having liquidity problems it would also have, or soon have, capital problems. But there have still been cases in a number of countries where banks with capital levels higher than the regulatory minimum had to be bailed out due to liquidity problems. The following is a brief review of how these cases were resolved. We also provide a brief description of what compensation shareholders were offered in each case.

1. Northern Rock (Great Britain)[1]

Northern Rock is a British mortgage bank that raised most of its funding on interbank markets. This business model turned out to be highly sensitive to the loss of liquidity caused by the subprime mortgage crisis in the United States. As a result, Northern Rock was obliged to request emerging financing from the Bank of England on September 14, 2007. The institution was nationalized in February 2008. Despite its liquidity problems, the capital adequacy ratio (Índice de Capitalización, or ICAP) never fell below the regulatory minimum.

ICAP Northern Rock

Date	2007		2008	
	June	December	June	December
ICAP	18.20%	14.70%	10.20%	10.80%

In its report entitled "**The Run on the Rock**," published on January 24, 2008, the House of Commons Treasury Committee stated that "*The problems affecting Northern Rock were those of liquidity and funding, rather than solvency*." On February 17, 2008, the date on which Northern Rock was nationalized, the authorities announced that, in the opinion of the Financial Services Authority (FSA), the bank was still solvent.

Compensation for shareholders: To fix the amount of compensation shareholders would receive, an independent appraiser was hired. The financial authorities required that this appraisal be conducted on the assumption that the bank had not obtained government support or liquidity from the central bank. Although the appraiser has been working on the case since September 8, 2008, it has not yet determined the amount of compensation.

2. Bear Stearns (U.S.A.)[1]

Bear Stearns was the first investment bank in the United States to be bailed out for liquidity problems, a decision that was finally made in March 2008. At that time, U.S. investment banks had no access to standing liquidity facilities from the Federal Reserve, so Bear Stearns had no other option than to merge with JP Morgan. Despite the lack of liquidity, its ICAP remained above the regulatory minimum until the merger was finalized.

ICAP Bear Stearns

Date	2007	2008		
	December	January	February	March
ICAP	13.70%	14.70%	10.15%	10.76%

In a press release dated March 20, 2008, the SEC explained: "The fate of Bear Stearns was the result of a lack of confidence, not a lack of capital … until its agreement to be acquired by JP Morgan Chase over the weekend, the firm had a capital cushion well above what is required to meet supervisory standards."

Compensation for shareholders: On March 24, 2008, with the support of the U.S. Federal Reserve, JP Morgan agreed to absorb Bear Stearns through the exchange of shares at a conversion ratio of 0.021753 JP Morgan Shares for every one Bear Stearns share, an exchange equivalent to a price of 10 dollars per share. The agreement was approved by shareholders on May 29, 2008, with 84 percent of votes in favor.

3. Lehman Brothers (U.S.A.)

On September 15, 2008 after negotiations with other banks broke down and the Federal Reserve refused to lend financial support for a merger, Lehman Brothers declared bankrupt.

Lehman Brothers was the second investment bank to run into severe problems due to liquidity. As in the other cases, in the months preceding its bankruptcy, Lehman Brothers' capital adequacy ratio met with regulatory minimums.

ICAP Lehman Brothers

Date	2007	2008	
	December	March	June
ICAP	13.33%	14.70%	10.15%

In the document entitled "Events Leading to the Chapter 11 Case" from section II of Lehman Brothers' bankruptcy filing, the firm states: "*The uncertainty, particularly among the banks through which the Company clears securities trades, ultimately made it impossible for the company to continue to run its business*."

Compensation for shareholders: In this case, Lehman Brothers shareholders received their corresponding portion of the bank's liquidation in the bankruptcy proceedings.

4. Fortis Bank (Benelux: Belgium, Holland and Luxembourg)

Fortis was one of the financial groups most heavily affected by the global financial crisis. The emergency loans extended in late September 2008 were not enough to alleviate its liquidity problems, so Benelux authorities were forced to bail out the bank, even though its ICAP still remained higher than the regulatory minimum.

ICAP Fortis

Date	2007		2008
	June	December	June
ICAP	10.70%	10.10%	10.80%

In the press release "Annual Review 2008" published by Fortis on March 31, 2009, it state that: "Fortis was heavily impacted by rumors about liquidity. Emergency liquidity support from the central banks at the end of September turned out to be insufficient and immediate action was required."

Compensation for shareholders: The bailout of the banks in this group is currently the subject of a legal dispute between shareholders and Belgian and Dutch authorities regarding the value of the shares.

Regulation in Mexico

In 2006, the Credit Institution Law (Ley de Instituciones de Crédito, or LIC) was amended to establish a regulatory framework for bank bailouts. In the contest of this reform, regulators took into account that, albeit highly unlikely, there could be a case in which banks with an ICAP above the regulatory minimum, and thus considered "solvent," might run into liquidity problems forcing them to default on their payments. They therefore found it necessary to create a mechanism for taking control of solvent but illiquid banks. The ordinance explains the grounds for revocation for default, which establishes that the National Banking and Securities Commission may revoke a bank's authorization to operate when:

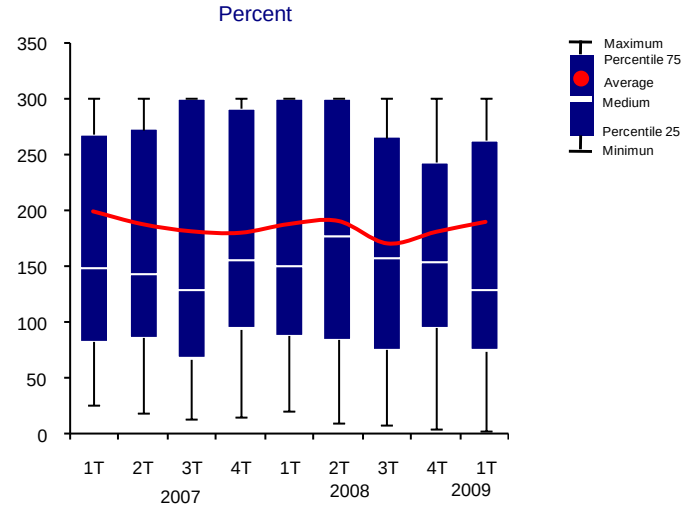
- It fails to make payment on loans or credits from another bank, foreign financial institution or Banco de México, or defaults on payments pertaining to securities it has issued in an amount equal to or greater than 20 million UDIs; or
- If within a period of two or more days, the institution fails to settle its obligations in clearinghouses or fails to fulfill withdrawal requests by at least 100 clients, for an amount equal to or greater than 2 million UDIs..

1. For more details on the Northern Rock and Bear Stearns cases, see Boxes 6 and 7 of the 2007 Financial System Report.

An analysis of commercial bank liquidity positions shows that on average there were no major changes in the asset to liability ratio (A/L) or 30-day liquidity ratio during 2008 (Graph 78a).[53] However, some banks presented signs of deterioration. In fact, the number of banks with an A/L ratio of below 100 percent increased in 2008 and during the first quarter of 2009 (Graph 78b).

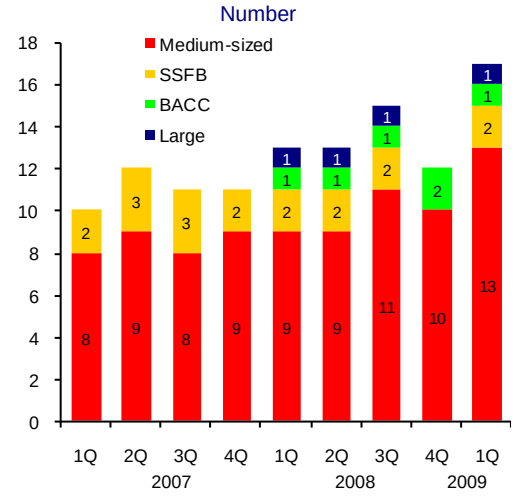
Graph 78
Asset to Liability Ratio (A/L)

a) System's 30-day A/L Range



Figures as of March, 2009.
Source: Banco de México.

b) Banks with A/L < 100%



Figures as of March, 2009.
Source: Banco de México.

The liquidity coefficient for the group of largest banks remains at around 200 percent on average (Graph 79a). However, within that group, the liquidity situation varied among banks. Likewise, the asset to liability ratio was below 100 percent on average, which could be indicative of vulnerability (Graph 79b). Also, the coefficients of the banks in this group were mostly diminishing.

The BACC bank group showed an asset to liability ratio of above 250 percent on average. Even so, it was a marked downtrend, especially in the case of the lowest of the group. However, most of the banks in this group closed the year with liquidity ratios of above 100 percent. The deterioration in liquidity positions has been reflected in efforts among banks, mainly medium-sized ones and BACCs, to increase over-the-counter deposits through very aggressive advertising campaigns. Furthermore, the CNBV modified regulations to enable banks to issue securities through brokerage firms as an alternative source of funding. These securities will consist of promissory notes with yields payable at maturity (PRLVs) or certificates of deposit (CDs) which are nominative, non tradable and non negotiable. Given their characteristics, these securities have an IPBAN guarantee of up the equivalent of 400 thousand UDIs. Banks that wish to

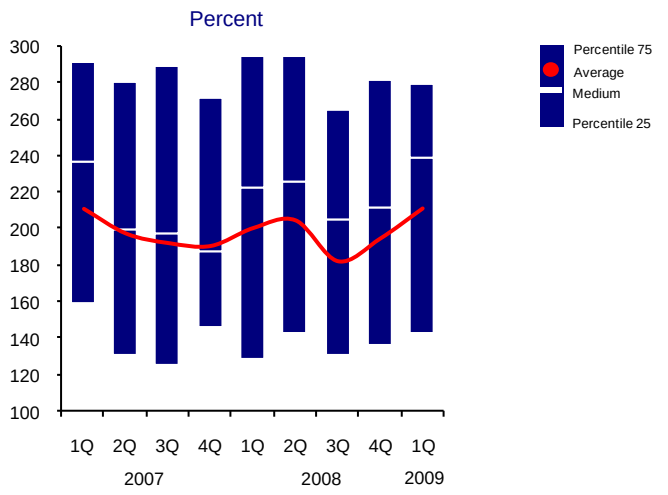
[53] As explained in detail in the 2006 Financial System Report, in order to calculate the ratio of assets to liabilities (A/L) maturing in less than 30 days, liquid assets and liabilities were classified according to their maturity date. The asset heading contains items which despite having long maturity dates are considered very liquid because they have a secondary market in which they can be traded without this resulting in major price variations, such as government securities. All of the liabilities were classified according to their maturity with the exception of public deposits, which were classified based on a statistical analysis of their stability or degree of permanence based on historical data for each bank (see Box 13 of the 2006 Financial System Report).

issue the aforementioned securities must have a capital adequacy ratio of at least 12 percent.

SSFB maintained an average ratio of above 150 percent and the bank with the lowest ratio showed a significant improvement, closing the year with a ratio of around 100 percent, although by the first quarter of 2009 it had decreased slightly. The recent trend in the liquidity of some banks showed them to be more vulnerable than in the past, underscoring the need to improve liquidity management.

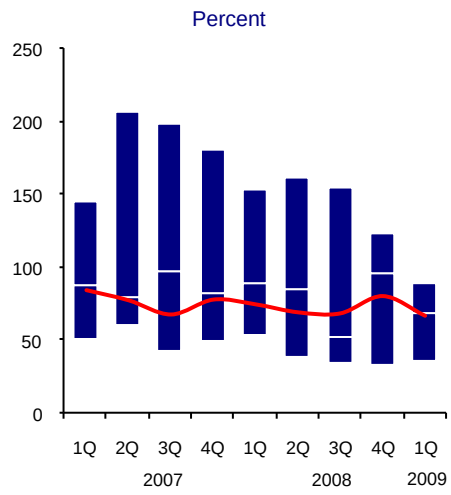
Graph 79
Assets as a Proportion of Liabilities Maturing in the Next 30 Days
(Quarterly Moving Averages)

a) Large Banks



Figures as of March, 2009.
Source: Banco de México.

b) Medium-Sized Banks



Figures as of March, 2009.
Source: Banco de México.

In October 2008, Banco de México created a new liquidity facility which extended guarantees on liquidity loans including previously unaccepted debt securities which pay a lower interest rate.[54] In December 2008, the new liquidity facilities were broadened to include as guarantees loans granted by banks to states and/or municipalities whose payment source or guarantee are federal revenue sharing or contributions contained in items 28 or 33 of the Federal Expenditure Budget.[55]

Besides the A/L ratio, another indicator of exposure to potential liquidity problems is the concentration of financing sources. The greater the concentration, the greater the dependency on fewer sources, and therefore the greater the exposure to an eventual loss.

In order to measure the concentration of financing in the interbank market the Herfindahl-Hirschman Index (HHI) is used.[56] When this indicator is close to the unit it reflects high dependency on few bank counterparties. Between

[54] These facilities are regulated by Circulars 48/2008 and 49/2008 issued by Banco de México. For more information on the October 2008 liquidity facilities see Box 4 of the July-September inflation report.

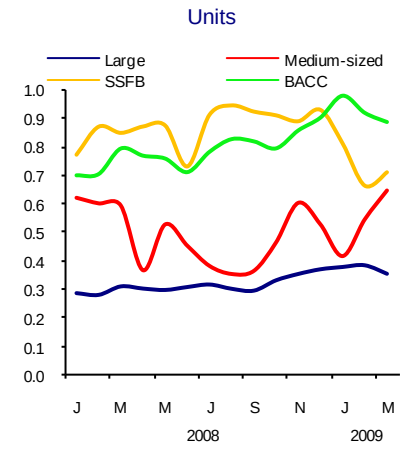
[55] These changes were undertaken through Circular 61/2008 issued by Banco de México.

[56] For exposure reasons a standard version of IHH is used so that the lowest value is asymptotic to zero and the highest value is one.

September and October, there was an increase in the concentration of financing obtained in this market. The rise in the concentration index just when the crisis worsened is evidence of a market contraction. The concentration index for large banks rose in the case of both loans received and granted, reflecting greater counterparty selection. However, in the case of large banks, the concentration of received loans remained at low levels, unlike the SSFB and BACC groups with an index much closer to one (Graph 80a and b).

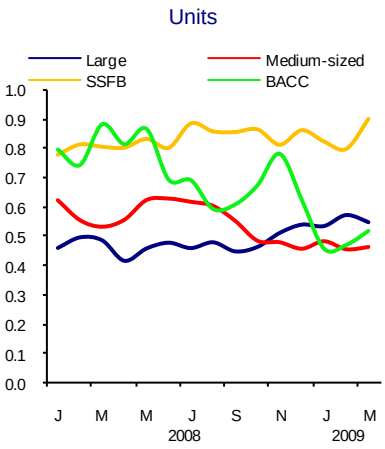
Graph 80
Concentration of Interbank and Money Market Loans

a) HHI of Received loans



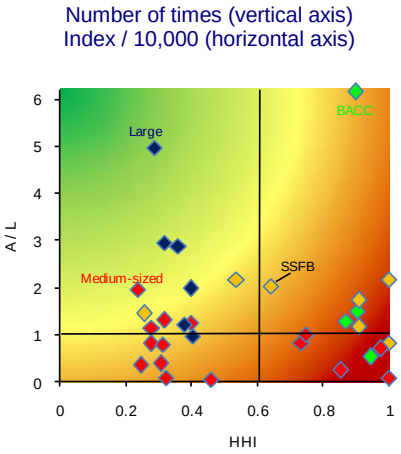
Figures as of March, 2009.
Source: Banco de México.

b) HHI of Granted Loans



Figures as of March, 2009.
Source: Banco de México.

c) HHI of Loans Received Versus A/L Liquidity Ratios (Commercial Banks)



Figures as of March, 2009.
Source: Banco de México.

Taken together, the two indicators presented in this section for measuring liquidity risk (the A/L ratio and the HHI of received Interbank loans) enable the overall liquidity situation to be identified (Graph 80c). Around 40 percent of banks are shown to have a liquidity ratio of greater than or close to 100 percent and a low HHI; another 40 percent presented problems in one of the indicators and the rest had a low liquidity ratio and a high HHI. All of the large banks are in the first group.

The recent crisis highlights the importance of successfully managing this risk. In an effort to better educate financial sector players in this regard, in September 2008, the Basel Committee on Banking Supervision (BCOBS) published the “Principles for Sound Liquidity Risk Management and Supervision” (Box 32). Most of this document refers to banks’ liquidity risk management for which a series of sound practices are put forward. The document also establishes guidelines for authorities. Although they do not abandon the idea of requiring that banks meet some general liquidity indicators, emphasis is placed on assessing the management of liquidity risk on an individual basis.

Box 32

Principles for Sound Liquidity Risk Management and Supervision (BCBS[1])

1. A bank should establish a liquidity risk management plan that ensures it maintains sufficient liquidity to withstand a range of stress events. Supervisors should assess the adequacy of both a bank's liquidity risk management framework and its liquidity position.
2. A bank should clearly articulate a liquidity risk tolerance that is appropriate for its profile.
3. Senior management should develop a strategy, policies and practices to manage liquidity risk in accordance with the risk tolerance. A bank's board of directors should review and approve the strategy, policies and practices at least annually.
4. A bank should incorporate those costs, benefits and risks associated with liquidity issues, in its valuation and measurement of each business line performance, as well as on a new product approval process.
5. A bank should have a sound process for identifying, measuring, monitoring and controlling liquidity risk. This process should include a robust framework for comprehensively projecting cash flows arising from: a) balance sheet assets and liabilities; off-balance sheet items and possible non-contractual "obligations". On this respect there must be special attention to exposures from securitization special purpose vehicles or other investment funds that are managed by the bank through which it may be exposed to reputational risk; and c) foreign-currency transactions.
6. A bank should actively manage liquidity risk exposures and funding needs within and across legal entities, business lines and currencies.
7. A bank should establish a funding strategy that provides effective diversification in the sources of funding and should regularly gauge its capacity to raise funds quickly from each source.
8. A bank should actively manage its intraday liquidity positions and risks to meet payment and settlement obligations on a timely basis under both normal and stressed conditions and thus contribute to the smooth functioning of payment and settlement systems.
9. A bank should actively manage its collateral positions, differentiating between encumbered and unencumbered assets.
10. A bank should conduct stress tests for a variety of scenarios to ensure that current exposures remain in accordance with a bank's established liquidity risk tolerance. Such stress test outcomes may be use by the bank to adjust its liquidity risk management strategies (if it is necessary) and to develop effective contingency plans.
11. A bank should have a formal contingency funding plan that clearly sets out the strategies for addressing liquidity shortfalls in emergency situations.
12. A bank should maintain a cushion of liquid assets to be held as insurance against a range of illiquidity stress scenarios
13. A bank should publicly disclose, on a regular basis, information that enables market participants to evaluate its liquidity risk management framework and liquidity position.
14. Supervisors should regularly perform a comprehensive assessment of a bank's overall liquidity risk management framework and liquidity position. The purpose is to determine whether they deliver an adequate level of resilience to liquidity stress given the bank's role in the financial system.
15. Supervisors should supplement their bank evaluations with a combination of internal reports, prudential reports and market information.
16. Supervisors should intervene when necessary to require timely remedial action by a bank in addressing deficiencies in its liquidity risk management processes or liquidity position.
17. Supervisors should communicate with other supervisors both within and across national borders. Communication should occur regularly during normal times, and should increase as appropriate during times of stress.

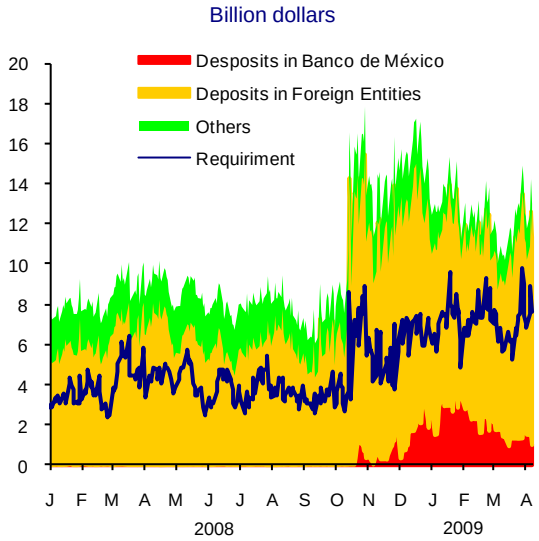
1. Basel Committee on Banking Supervision

Particularly important to the correct management of liquidity risk is the inclusion of risk-tailored stress tests as well as appropriate Contingency Financing Plans (CFPs). For this purpose each bank must undertake tests corresponding to different stress scenarios and different severity levels. CPPS must generally specify the steps to follow in the event of a liquidity contingency but must also respond specifically to each of the stress tests.

Another important recommendation included in the BCOBS principles is that when managing liquidity risk, banks must take into account the size of their foreign currency exposure. Regarding this, current foreign-currency liquidity regulations have facilitated banks meeting foreign-currency obligations, as shown in Graph 81a. In October 2008, when the crisis worsened and the foreign currency market came under pressure, banks increased their liquid asset holdings, especially through deposits with foreign banks. This increase was financed largely through derivative transactions (Graph 81b).

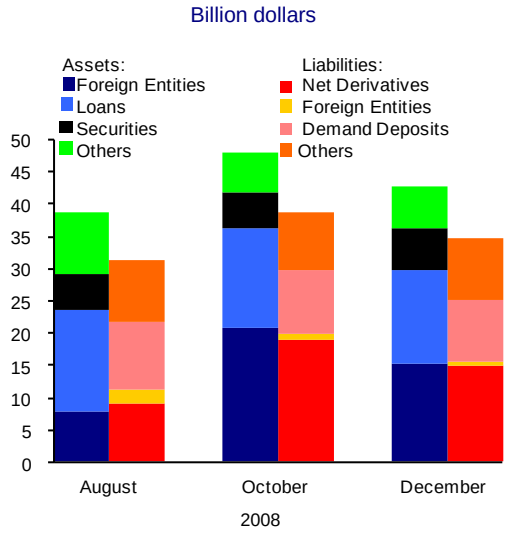
Graph 81
Banking System's Liquidity Trend

a) Liquidity Requirement and Liquid Assets



Figures as of April, 2009.
Source: Banco de México.

b) Breakdown of Foreign Currency Assets and Liabilities



Figures as of March, 2009.
Source: Banco de México.

Foreign currency positions contrast with vulnerabilities found in aggregate liquidity positions (some banks with low liquidity ratios and high financing concentration indices). In light of this, and taking into account the main principles published by BCOBS, both the financial authorities and banks as well as other financial institutions need to enhance their models and systems to ensure liquidity risk is appropriately managed and monitored.

6. Other Intermediaries

In this section we examine the evolution of the Afores during 2008 and the first half of 2009.

6.1. Pension Fund Managers (Afores)

Reforms to the Mexican pension system are one of the biggest structural reforms to have taken place in the country in the last fifteen years. The reforms constitute a milestone in terms of the creation of a more inclusive, fairer and long-term financially sustainable social security system. Mexico's private workers' retirement savings system has been operating on the basis of individual accounts for 12 years. In March 2007, the National State Workers' Pension Fund (PENSIONISSSTE) was created, an institution which manages and invests the resources of the individual accounts of public sector workers who chose this retirement scheme.

The first virtue of a system based on individual accounts is that its financial viability is independent on the change in demographic patterns. In Mexico, as in many other countries, the advent of social security[1] went hand in hand with the creation of defined benefit pension systems. As their name suggests, these systems promise workers a set benefit upon retirement, but do not create any provisions to finance the related obligations. Such systems work well as long as the contributions that active workers make are enough to meet the pensions of retirees.

However, when populations age, such systems become financially unsustainable and require growing subsidies from active workers in the form of bigger social security contributions or taxes. This is why defined benefit systems can end up putting the solvency of the public sector in peril. The first big advantage of the aforementioned reforms has been to eliminate the serious vulnerability of public finances in Mexico. Besides guaranteeing the financial viability of the pensions system and reducing future fiscal pressures, pension system reforms have brought a further three big benefits, two directly in favor of workers and one in favor of the Mexican economy as a whole.

The first consists of providing a greater number of workers with a sustainably bigger pension. When investment and risk diversification decisions are made by specialized entities which also compete with each other, conditions conducive to safeguarding and maximizing the value of workers' savings through the end of their productive lives are created, so ensuring them a better pension. This does not necessarily happen if the fund manager is a government institution with other objectives[2].

[1] The Mexican Social Security Institute (IMSS) was created on January 19th, 1943. The State Worker Social Security and Services Institute (ISSSTE) was created on December 30th, 1959; its predecessor, the General Directorship of Pensions and Retirement was created on August 12th, 1925. These institutions are based on the 1917 Constitution.

[2] A government entity which manages a large amount of public funds is susceptible to them being used at some point to finance the fiscal deficit. The repayment of the corresponding debt becomes the responsibility of either the current or future governments. The situation could be repeated by several governments and eventually put workers' pension funds at risk.

An important observation about the nature of Afore investment portfolios should be made here. The current regime was designed to capitalize on the advantages of diversification, such as those deriving from calculated risks in order to maximize investment yields and thus obtain the highest possible amount of funds in workers' savings accounts upon retirement. While the regime permits a financial strategy which reduces the investment risk in accordance with the worker's age, it does not fully eliminate risk taken over the productive life of the worker. The investment strategy requires that investments be diversified among long-term instruments tailored to each worker's profile, which may at times result in the depreciation of workers' funds, as was the case at the end of 2008 due to the international financial crisis. Any investment implies a risk; while the short-term contains risks derived from the mark-to-market of investment positions, the Siefores' portfolios are structured so as to minimize long-term risks, and so asset depreciations usually fully recover once market workings return to normal.

The second benefit refers to the portability of the retirement savings of workers who leave the public sector for a job in the private sector and vice versa. Before PENSIONISSSTE was created, public sector workers who migrated to the private sector could not transfer their accumulated retirement funds to any Afore. Likewise, private sector workers who migrated to the public sector could not transfer their savings to a new ISSSTE retirement savings account but could claim them upon retirement. By making Afore and PENSIONISSSTE retirement savings accounts portable, pension system reforms promote labor mobility within Mexico.

The third benefit of Mexico's pension system reforms was the creation of a very important long-term source of funding, which can be used to finance public and private infrastructure investment projects that normally require long-term financing. Infrastructure investment projects are essential to raising the productivity of any economy and promoting a sustained and high rate of economic growth. The 1997 enactment of the social security reforms encouraged financial saving in Mexico, while the maturities of both government and private debt issues were lengthened, thereby facilitating the financing of infrastructure investment projects. Thus, between 1998 and 2008, financial savings rose from 42 percent to 59 percent of GDP and over the same period public and private debt issue maturities notably increased, demonstrating how besides benefitting workers, pension reforms also favored the Mexican economy as a whole.

As mentioned, one of the benefits of an individual account pension system is that it allows an optimum investment strategy to be established in accordance with each worker's profile. In March 2008, three new types of Siefores came into force to enable pension fund managers to differentiate risk tolerance according to age. For example, younger savers have a longer-term investment horizon. The change enables the Afores to manage portfolios (Siefores) with different levels of risk and expected yield (Box 33).

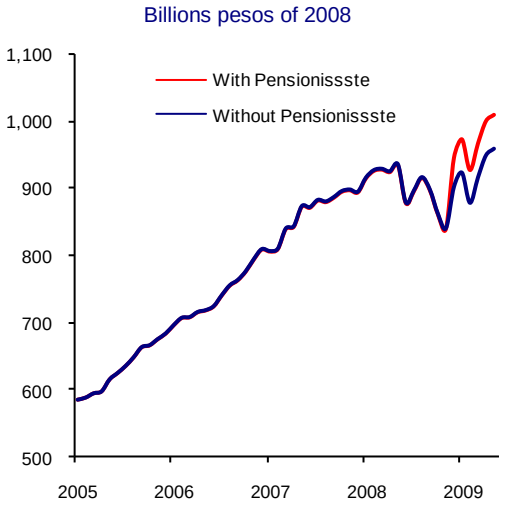
As at May 2009, the Afores had 1.01 billion pesos in assets under management, or 9.1% of GDP[3] and year-on-year growth of 8.1 percent, mostly attributable to the accumulated increase in the Retirement Unemployment and Old Age subaccount of ISSSTE affiliated workers[4] (Graph 82).

[3] This figure includes workers' voluntary funds.

[4] The enactment of the new ISSSTE Law in January 2008 created Pensionissste, which manages the Individual Accounts of ISSSTE workers with the exception of funds in the Housing subaccount which are managed by Fovissste.

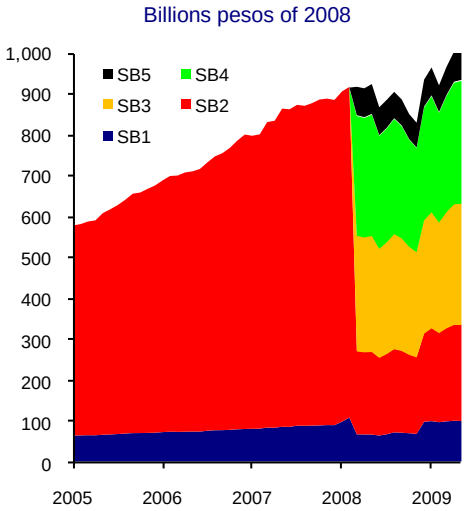
Graph 82
Structure

a) Assets Managed by Siefores



Figures as of May, 2009.
Source: Consar.
1/ Net assets of the basic Siefores excluding voluntary contributions.

b) Evolution of Assets by Siefore Type[1/]



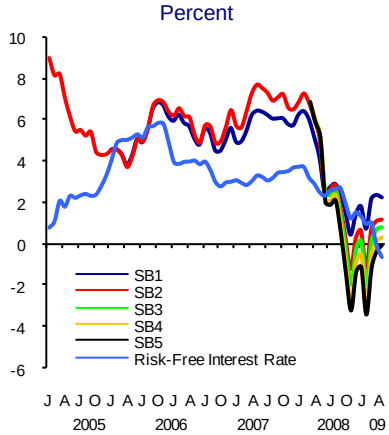
Figures as of May, 2009.
Source: Consar.

Current economic environment

The Siefores used their investment regime to diversify their portfolios among instruments with different risk profiles and yields. This strategy resulted in favorable performance within the positive environment which prevailed for several years (Graphs 83a and b). Nevertheless, the plunge in financial markets during the recent crisis generated big losses, especially in portfolios more exposed to equities and long-duration securities (Graph 83c). Thus, in December 2008, the real 36-month yield before fees was -0.22 percent, but by May 2009, the losses had been recovered, and the nominal 36-month yield was 0.82 percent.

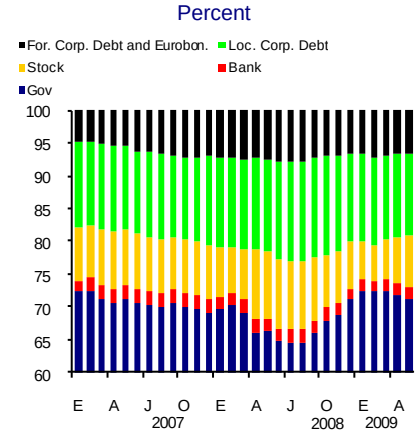
Graph 83
Yields and Composition of the Siefores' Investment Portfolio

a) Real Management Yield



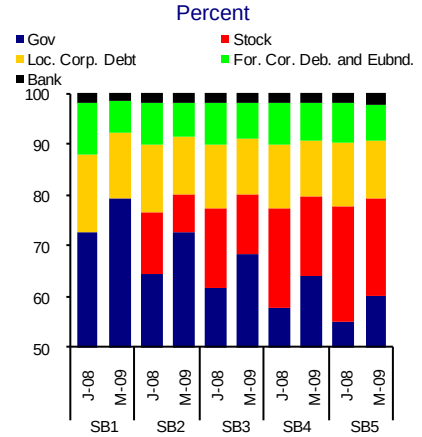
Figures as of May, 2009.
Source: Consar.

b) Asset Structure



Figures as of May, 2009.
Source: Banco de México.

c) Asset Structure by Siefore Type



Figures as of May, 2009.
Source: Consar.

The Siefores' market risk is measured using the indicator Value at Risk (VaR). Through the investment regime, the National Retirement Savings System Commission (Comisión Nacional de Ahorro para el Retiro, Consar) sets VaR limits and portfolio reallocation rules when said limits are surpassed. These rules were designed to limit the degree of exposure to risk so that in the event of adversity, individual Siefore depreciations are contained. However, the rules were designed to promote sound risk management by Siefores more than to deal with systemic problems which increase the risk of Siefores as a whole. Therefore, there are exceptional circumstances in which if VaR limits are surpassed, reallocation rules can exacerbate depreciations in investment instruments when a significant number of Siefores are forced to adjust their portfolios simultaneously.

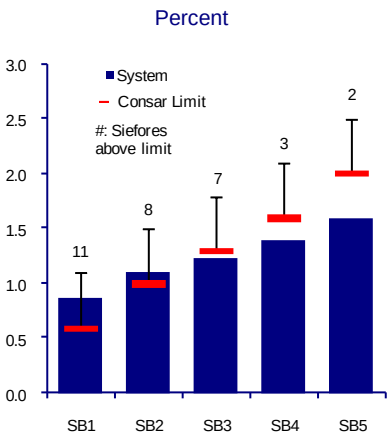
Given the size of the financial crisis and the potential effect a massive asset sell-off would have during a period of high turbulence, Consar decided to allow VaR limits to be surpassed without the portfolio reallocation established in the investment regime having to take place. This prevented sudden portfolio reallocations through forced asset sell-offs, which would have generated similar widespread behavior (Box 33) resulting in even greater instability. Nevertheless, one of the pillars of the individual accounts system is an investment regime which provides asset managers with certainty regarding medium and long-term strategies. When the rules are uncertain, long-term investment decisions become difficult to make and portfolio managers may become more conservative. In any case, it would be appropriate to examine whether it is possible to adopt more robust risk measures less susceptible to review.

Turbulent financial conditions also cause the *ex post* break of the positive risk-return relationship. The more conservative Siefores (Basic 1, 2 and 3) obtained better yields than the more aggressive ones (Basic 4 and 5) besides registering lower risk levels.[5] Correlations supporting the diversification model for reducing the risk of an investment strategy were also broken (Graph 84). This correlation loss is normal during episodes of financial turbulence.

[5] The risk measure used is VaR with a 97.5 percent confidence level and a one-day risk horizon. To estimate VaR, historical scenarios pertaining to the last 500 asset price observations for each Siefore are used. For more information on how this indicator is calculated, see Annex G of Consar's circular 15-19.

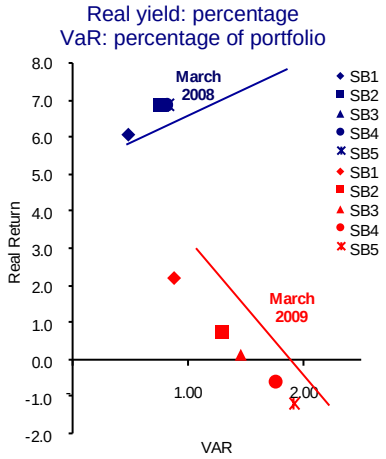
Graph 84
Risk Indicators

a) VaR Limit by Siefore Type and Number of Siefores Above the Limit



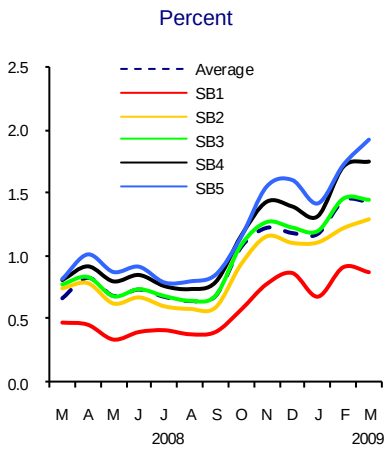
Figures as of December 2008.
Source: Consar.

b) VaR and Profitability by Siefore Type



Figures as of March 2009.
Source: Consar.

c) Historical Trend in VaR by Siefore



Figures as of March 2009.
Source: Consar.

Management[6] and affiliate yields

As was recently made all too clear, the management of the Afores cannot be assessed on a short-term basis. Only over a medium and long-term horizon is it possible to appreciate the individual skills of each fund manager independently of the performance of financial markets as a whole. It is therefore essential that savers have access to information about what each manager has to offer. This information should include historical returns and the level of risk and sophistication with which the manager uses the investment regime.

During 2008, the Siefores registered the lowest Management Yields since their creation amounting to -5.4 percent in real annual terms. Furthermore, if the fee charged by the manager known as the "Combined Affiliate Yield Index" (Índice de Rendimiento para el Conjunto de los Afiliados, IRCA) is taken into account, in 2008 depreciation was 7.1 percent. It should be noted that since June of this year, depreciations registered during 2008 have fully recovered. Despite 2008 results, both measures of return have historically been above the real risk-free return, as reflected in Table 12, which shows the Management Yield of each pension fund manager since inception and the Affiliate Yield including fees charged, since the beginning of operations.[7,8]

[6] The Management Yield (MY) is an indicator which measures the increase in percent in the prices of Siefore shares before fees on the balance are charged. This indicator only provides insight into Siefore performance in terms of asset management, not the return affiliates obtain on their contributions.

[7] For more details on how these yields are calculated see Box 18 and the footnote on page 111 of the 2006 Financial System Report.

[8] The real risk-free rate is the monthly average yield on the 28d Cete less monthly inflation based on the NCPI.

Table 12
Management and Affiliates' Yield Indicators

Pension Fund Managers	Average Management Yield [1/]			Affiliates' Historical Yield		
	2007	2008	2009	2007	2008	2009
Actinver[2/]	4.5	5.0	5.0	-0.6	-0.4	-0.4
Afirme Bajío[4/]	4.2	2.3	5.4	1.1	-0.8	1.9
Ahorra Ahora[5/]	3.4	-4.0	-1.1	-11.5	-10.6	-7.4
Azteca[2/]	4.1	2.9	2.7	-1.0	-1.4	-1.2
Banamex	8.0	6.3	5.5	4.8	3.2	2.6
Bancomer	7.2	5.5	4.8	4.1	2.6	2.0
Banorte Generali	7.3	5.6	4.6	3.5	2.1	1.2
Coppel[5/]	3.4	-0.4	0.0	-6.4	-4.6	-4.1
De la Gente[5/]	4.0	3.1	3.1	0.0	-7.4	-7.4
HSBC	7.3	6.0	5.5	3.7	2.6	2.3
Inbursa	6.5	5.7	5.6	5.1	4.3	4.2
ING	7.6	6.0	5.5	3.8	2.5	2.1
Invercap[4/]	5.5	0.5	-1.9	1.6	-2.3	-4.0
Ixe[3/]	5.3	3.2	2.0	1.1	-0.8	-1.4
Metlife[4/]	5.0	1.6	-0.3	0.8	-1.5	-2.7
Principal	7.5	6.0	5.3	4.4	2.9	2.3
Profuturo GNP	8.2	6.4	5.7	4.3	2.7	2.1
Santander	7.6	7.0	7.0	2.6	2.3	2.3
Scotia[5/]	2.8	-0.2	5.4	0.0	-2.6	1.6
XXI	7.6	6.2	5.7	4.4	3.0	2.7
Average	7.3	5.9	5.3	3.9	2.7	2.2

Figures as of May, 2009.
Source: Banco de México.
1/ Geometric mean of annual yields between August 1998 and December 2007 and 2008. 2/ Data as of 2003.
3/ Data as of 2004.
4/ Data as of 2005.
5/ Data as of 2006.

The individual pension funds industry is based on a model which depends specifically on information that savers receive concerning differences in the way Afores are managed (risk, return and fees). During the financially turbulent months it became difficult to compare them, partly because some fundamental relationships between variables were broken. It is important that disclosure of all the information resume so workers can compare the asset management of the different Afores. This is a fundamental precept to encouraging and obtaining the benefits afforded by competition in this industry.

Fee Structure

At the end of 2008 the Retirement Savings Systems Law (Ley de los Sistemas de Ahorro para el Retiro, LSAR) was amended in order to give the Consar powers to regulate the fee structure of the Siefores. Thus a 2009 fee structure was approved in which the Afores which charged the highest fees in 2008 must lower them to levels closer to their competitors' average level. In 2009 account balance fees show an average reduction of 1.94 to 1.81 percent on the previous year (Table 13). This measure will increase the account balances of workers' pensions over time.

Table 13
Structure of Management Fees
Percent

Pension Fund Managers	On Flows	Asset-Based		
	2007	2007	2008	2009
Actinver	15.5	0.2	n.a.	n.a.
Afirme Bajío	9.5	0.2	1.7	1.7
Ahorra Ahora	10.8	0.2	3.0	1.9
Argos	14.9	0.1	1.2	1.2
Azteca	13.8	0.4	2.0	1.9
Banamex	11.5	1.5	1.8	1.8
Bancomer	17.8	0.5	1.5	1.5
Banorte Generali	10.8	1.1	1.7	1.7
Coppel	14.2	0.3	3.3	1.9
De la Gente	12.3	0.3	n.a.	n.a.
HSBC	11.5	1.2	1.8	1.8
Inbursa	7.7	0.5	1.2	1.2
ING	10.8	1.5	1.7	1.7
Invercap	12.3	0.4	2.5	1.9
Ixe	11.7	0.3	1.8	1.8
Metlife	18.5	0.7	2.3	1.9
Principal	24.6	0.4	2.1	1.9
Profuturo GNP	24.6	1.2	2.0	1.9
Santander	10.8	1.5	n.a.	n.a.
Scotia	18.8	0.3	2.0	1.9
XXI	9.2	1.5	1.5	1.5
Average	13.9	0.7	1.9	1.7

Figures as of June, 2009.
Source: Consar.

Box 33

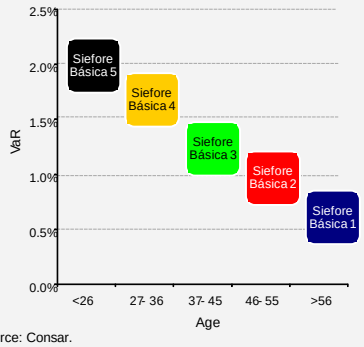
Siefore Investment Rules and Limits

In March 2008, three new types of retirement mutual funds (Investment Funds Specialized in Retirement Savings, Siefores) were created: Básica 3, Básica 4 and Básica 5. Combined with the two existing types, the new funds expanded the range of options available to invest the savings workers had accumulated in their retirement savings accounts, managed by Pension Fund Managers (Afores). Before that, the scheme was limited to "Básica 1" and "Básica 2" Siefores, and was obviously more limited in the diversification of portfolios and hence the potential yields that could be obtained.

The National Retirement Savings System Commission (Comisión Nacional de Ahorro para el Retiro, or CONSAR) decided that because retirement savings were so important to the economy, there should be ways to invest them to obtain higher returns while protecting the original assets invested. Its solution was to expand the family of Siefores available for investment, each with its own investment regime, and each regime corresponding to different degrees of risk, different terms, origin and destination of the assets invested in each mutual fund.

Selecting which funds would go into which type of Siefore was decided on the basis of the worker's age: retirement savings for the youngest workers would go to those with the highest risk profile, and older workers' savings would go to mutual funds limited to investing in lower-risk instruments. So as the worker's age increases, risk aversion also rises: younger workers have a longer period ahead of them to invest their funds and thus can accept higher-risk investments. As the worker's age increases, his or her savings are moved along the line to a more conservative investment regime. That said, workers can choose a more conservative fund at any time according to their own level of risk aversion (see graph 1).

Graph 1
Siefores Types and Risk Levels
Percent



Source: Consar.

Investment Limits

Under CONSAR regulations,[1] "Básica 1" Siefores have the lowest risk profiles. Because they have the shortest investment horizon allowed for affiliated workers, their assets cannot be invested in any type of equity security, and only 10 percent of its assets can go into securitized instruments. This means they can invest all their assets in government securities. They must also have inflation protection on up to 51 percent of the portfolio. The "Básica 2" type can invest not only in government securities, but can allocate up to 15 percent of their assets to equity securities, 5 percent to structured instruments, 15 percent to securitized instruments, and 5 percent to real-estate investment trusts called FIBRAS.[2]

In contrast to the first two types, the "Básica 3" Siefores have a moderate risk profile. The investment rules on this type of fund limit it to 20 percent of its assets in equities or securitizations, and up to 10 percent in structured instruments or subordinated debt. "Básica 3" is also allowed to invest up to 5 percent in FIBRAS.

The "Básica 4" and "Básica 5" Siefores have the least rigid investment regime. Investment in equities is permitted at exposures of up to 25 and 30 percent, and in securitized instruments, up to 30 and 40 percent, respectively. In both cases, investment in FIBRAS and structured instruments can comprise up to 10 percent of the portfolio.

Throughout the Siefores family, up to 30 percent of assets can be invested in foreign currency and 20 percent in foreign securities (with a minimum credit rating of A-). They may also invest their entire portfolio in top-grade government and debt securities, 50 percent in those rated AA, and 20 percent in those rated A. In all cases, CONSAR requires at least two different ratings on each issue.[3] Finally, Siefores are permitted to invest in hedge instruments for the purpose of protecting workers' assets.

CONSAR limits each Siefore to no more than 5 percent of its assets in a single issue or in securities issued by a single top-grade issuer. For AA issues, this limit drops to 3 percent, and for A-rated issues, to 1 percent. In the case of foreign-currency denominated debt rated BBB+ and BBB-, the maximum exposure is 5 and 3 percent, respectively.

Table 1
Investment Limits

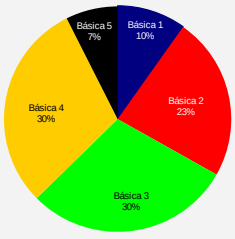
Investment Instruments	Basic Siefore				
	1	2	3	4	5
Market Risk	% of assets				
VaR	0.6	1.0	1.3	1.6	2.0
Equities (stock indices)	0	15	20	25	30
Principal protected notes (PPN)	0	15	20	25	30
Securitized instruments	10	15	20	30	40
Structured instruments and Subordinated Debt	0	5	10	10	10
Fibras	0	5	5	10	10
Foreign-Currency investment	30	30	30	30	30
Derivatives	✓	✓	✓	✓	✓
Other Limits					
Foreign securities	20	20	20	20	20
Instruments of related entitites	15	15	15	15	15
Instruments with equity ties to Afore	5	5	5	5	5
Inflation protected	✓ (51% min)	x	x	x	x

Source: Consar.

Asset distribution

As of March 2008, 90 percent of the assets were managed in "Básica 2" Siefores. Since then, however, the funds have begun to spread out into the newly-created Siefores. By May 2009, the "Básica 3" and "Básica 4" Siefores contained more than the other types--each with one-third of the total. The "Básica 5" fund was at that date the least popular, with only 7 percent of assets. Despite changes in the structure of the Siefores system, the amount of assets invested in "Básica 1" has remained at an average of 10 percent over time.

Graph 2
Asset Structure by Siefore[1]
Percent



1. Net assets of Básica Siefores not including Additional Figures as of May 2009.
Source: Consar.

1. Bulletin 15-19.
2. RealEstate Investment Trust.
3.The rating scale is local for domestic instruments and global for foreign instruments.

7. Transparency, Competition and Access to Financial Services

In the first part of this section, an analysis of the recent evolution of interest rates is made, particularly those associated with the commercial, credit card, and household loan portfolios. The second part of the section discusses the behavior of bank fees, while the third looks at recent amendment to the legal framework in relation to transparency, competition, and access to financial services.

7.1. Behavior of interest rates

Interest rates can be defined as the price at which funds in the economy can be transferred over time. In a perfect world, there would be a single equilibrium interest rate, which would simultaneously represent the return on savings and the cost of credit. However, in reality, there are different imperfections and uncertainties. This is where financial intermediaries fit in, whose function is to more effectively distribute savers' surplus funds to potential borrowers. These intermediaries charge for their services by increasing the interest rate charged to debtors (lending rates) and lowering the interest rate paid to depositors (borrowing rates). Thus, spreads between lending and deposit rates, which determine the net interest margin, are used to cover costs incurred in providing credit services, as well as to meet different risks, some of which, if financial intermediaries did not exist, would have to be directly assumed by savers.

As with any other price, the interest rates that borrowers pay are determined by the interaction between supply and demand. However, there is a difference between how market forces determine the price of a typical good and how they determine the price of a loan. While a good is immediately furnished and the transaction concludes at that moment, a loan represents a promise to pay in the future that is accompanied by the risk that the commitment will not be fulfilled. This default risk necessarily affects the level of the equilibrium interest rate, and can even alter the market equilibrium factors.[1]

Increases in demand for credit generally tend to increase the interest rates that debtors pay. Interest rate diversity contributes to a better allocation of funds in the economy by identifying and distinguishing different risk levels. For example, in an economy in expansion, profitable investment projects become relatively more abundant, there are more requests for credit, and, given a limited supply of financing, interest rates tend to increase. The advantage is that when rates rise, it is the most profitable projects that obtain financing. In a similar vein, in a country in which there is an increase in the percentage of young workers in the labor force, demand for credit will tend to expand, and if the supply of such financing does not grow proportionally, interest rates will also tend to rise. In both

[1] In credit markets rationed equilibrium may occur. This means that at the market equilibrium interest rate, demand for credit may exceed the supply. With rationed equilibrium, the gap between the demand and supply of credit is not eliminated through an increase in interest rates, as would occur in a typical market. This is because a hike in interest rates could increase the probabilities of debtors defaulting on their payments, the result being that the projected gain for the bank would diminish. This could be due to a moral risk issue or adverse credit selection (see synthesis of the material on equilibrium and rationing in the credit market in chapter 5 of *Microeconomics of Banking*, second edition, by Xavier Freixas and Jean-Charles Rochet, MIT Press, 2008).

cases the rise in interest rates has an important function in that it reflects the relative scarcity of credit, permitting better resource allocation.

The interest rates that debtors pay are also affected by changes in the supply of financing in the credit market. This supply depends on a wide range of variables, including the amount of deposits, the degree of competition among lenders, and the different costs financial intermediaries incur in providing such services. For example, an increase in the level of access to financial services would result, among other benefits, in more resources available for lending, thus increasing the supply of credit and lowering interest rates. In addition, greater information and transparency in relation to the characteristics of the credit services that financial intermediaries offer would favor greater competition in the market. This would, in turn, translate into smaller profit margins for intermediaries and lower interest rates for debtors. However, as will be seen later, one of the main factors determining interest rates are the costs banks face in providing credit services.

The interest rate that a bank charges should allow it to cover its costs and obtain a profit from granting the loan. The different costs in which a lender incurs can be classified as "known" and "contingent." Among the most important in the case of the former category, due to their amount, are the costs of funds, administrative costs, and regulatory costs. Funding costs are the marginal rate that would correspond to obtaining an additional peso[2], administrative costs refer to the costs incurred in the operation of the bank, and regulation-related costs are imposed by prudential regulations in determining capital requirements, credit provisions, monetary regulation deposits, and the deposit insurance fee, among others. These costs must be covered by the banks independently of whether debtors pay their loans or not. Meanwhile, contingent costs depend on random developments over which banks have little or no control, such as loan defaults, and are generated by the risks incurred in granting loans.

When a debtor fails to pay his or her loan, new costs arise that can be significant for banks. These include costs corresponding to paperwork procedures, collection efforts and legal actions (Box 34) and the creation of additional reserves to meet increased credit risks and bankruptcies should there be no recovery[3]. Although banks might not recover a loan, they have the obligation to return the money entrusted to them to all their depositors. Therefore, in order to meet contingency costs, they must include a risk premium in the interest rates they charge (Box 35) that allows them to cover costs associated with debtor defaults. The risk premium is an important component of interest rates globally, and is usually based on such factors as delinquency indices and the point in the economic cycle, the efficiency of the legal system, the availability of information and the cost of capital. It should be pointed out, however, that the risk premium can be partially reduced if the debtor offers an asset as a payment guarantee.[4]

Considering that interest rates are determined, in reality, by supply and demand conditions, it is not difficult to understand why they vary significantly

[2] To obtian the relevant marginal rate, factors considered include the term over which the funds will be lent. Thus, the marginal rate for consumer credit is different to the marginal rate for mortgage loans.

[3] According to the World Bank, the costs of bankruptcy procedures and their duration are higher and longer in Mexico than in many other countries.

[4] In the event of default, the guarantee enables the bank to recover a considerable part of the loan. (In the risk premium model described in Box 35, the guarantee makes the LGD variable decrease).

across different credit markets given their special characteristics. For example, interest rates banks charge on mortgage loans are lower than those charged on credit cards, which in turn are lower than those micro-financing companies charge. This is because besides mortgage loans having real estate as a guarantee, administrative costs are distributed throughout the life of the loan and the banks have access to sufficient information about the debtor's economic solvency. In the case of credit cards, there is no guarantee whatsoever, the recovery of the debt is slow and expensive, and the information on the debtor is more limited. In the case of micro loans, the cost of offering the service is very high as a percentage of the loan, the risk of default is greater, guarantees do not always exist, and there is not enough information on the economic solvency of many debtors.

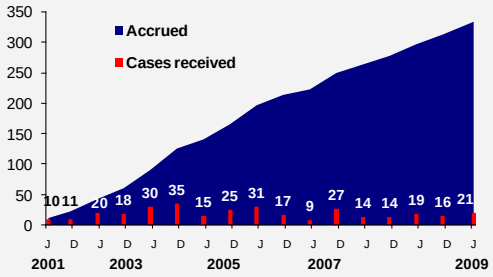
Given these considerations, is natural for there to be different interest rates in the economy and for them to constantly change according to the circumstances of debtors, markets and the economy as a whole. When interest rates are freely determined by market forces, they provide valuable information to enable this market to work as well as possible, to efficiently allocate resources in the economy, and thus foster economic growth. A weakening of economic conditions, such as occurred recently due to the international financial crisis, increases the risk of default, triggering a rise in interest rates and enabling financial intermediaries to continue granting credit. Setting a ceiling on interest rates in these circumstances may result in a credit crunch, thus aggravating the efficient allocation of funds. Raising interest rates above the increase in the risk premium would translate into greater profit margins for banks and attract new competitors, ultimately pushing interest rates down. Therefore, it is of fundamental importance that the financial authorities take ongoing measures to encourage competition in the credit market and access for new intermediaries.

Box 34

Recent Trends in Bankruptcy Proceedings in Mexico

During the last half of 2008 and the first of 2009, no substantial changes in the bankruptcy activity were observed in Mexico.

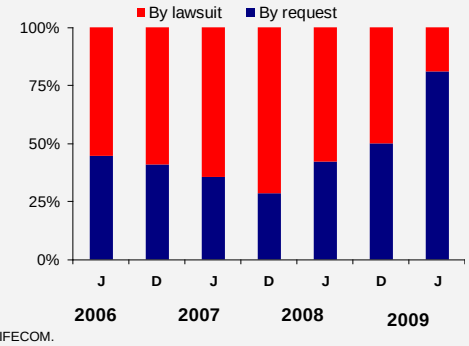
Number of Bankruptcy Filings by Semester



Source: IFECOM.

For example, the number of bankruptcy filings every 6-month period has been stable. Most of the companies that filed for bankruptcy protection as a way to deal with solvency problems belong to the manufacturing, construction, or retail industries. A bankruptcy proceeding may be initiated at the request of the company itself or by a suit on the part of its creditors. Here, statistics have shown a change of trend regarding the origin of the proceedings. From 2006 through 2007, were more the proceedings related to lawsuits than to bankruptcy filings. This trend reverses in 2008 and by the first half of 2009, 80 percent of bankruptcy proceedings were initiated by the companies themselves. This change is probably the result of a broader consciousness among the Mexican business community regarding the advantages of filing for bankruptcy protection as a tool for preserving and maximizing the value of distressed companies, without impinging on the rights of its creditors.

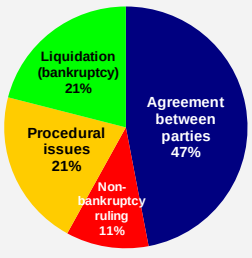
Total Bankruptcy Filings by Origin



Source: IFECOM.

Statistics also show that the majority of bankruptcy proceedings in Mexico were concluded through a mutual agreement between the parties.

Reasons for conclusion of cases



Source: IFECOM.

Formerly, Mexico City and the State of Mexico reported the highest number of bankruptcy filings. In the first half of 2009, the scenario changes, being Jalisco and Nuevo León the new leaders of the list.

Recent Bankruptcy Activity in Other Countries

As a result of the crisis, bankruptcy filings in several countries rose throughout 2008, this was particularly the case for the United States and the United Kingdom. Canada showed a fairly different behavior, since there was a gradual reduction in the bankruptcy activity.

Number of Companies that Initiated Bankruptcy Proceedings by Country, 2008.[1/]
Annual percent change

Qtr. 2008	Canada	United States	United Kingdom	Australia
I	-4	45	3	-9
II	-2	51	22	5
III	-1	67	30	18
IV	-2	68	84	17

Source: Banco de México based on bankruptcy statistics published by Deposit Insurance Agencies of each country. a) Canada (Office of the Superintendent of Bankruptcy); b) United States (The Bankruptcy Courts); c) United Kingdom (The Insolvency Service); d) Australia (The Insolvency and Trustee Service).
1/ Figures indicate the number of companies subject to reorganization or liquidation procedures, according to the bankruptcy codes of each country.

In France, the number of pending bankruptcy proceedings rose by 17 percent from the second to the third quarter of 2008. This country has not seen such an abrupt rise since 1997. In most cases the proceedings resulted in liquidations.[1]

Some Reflections

In contrast with other countries, bankruptcy activity in Mexico has remained stable, despite the economic activity contraction. This may suggest the presence of circumstances that have prevented companies and creditors from appealing to bankruptcy proceedings as a convenient tool to attend insolvencies. Firstly, companies are reluctant to file for a bankruptcy petition because of the stigma surrounding this process, as the entrepreneur is invariably associated with the image of a borrower that has failed to deal with his own debt problems. This idea merely reflects the lack of information regarding the benefits of a bankruptcy proceeding as a way to deal with insolvency issues. Secondly, international comparative studies by the World Bank[2] showed that countries with the most efficient bankruptcy proceedings are those characterized by faster and cheaper procedures, higher rates of recovery for creditors, and also by the extent to which it is encouraged that viable companies keep operating. According to the same study, the top-ranked economies were those that had set up specialized bankruptcy courts and which had reformed their bankruptcy codes in order to strengthen creditors' rights.

Bankruptcy Proceedings Efficiency Indicators

	Japan	Canada	United Kingdom	Australia	United States	Mexico
Global ranking	**1**	**4**	**9**	**14**	**15**	**23**
Time (years)	0.6	0.8	1	1	1.5	1.8
Cost [ii]	4	4	6	8	7	18

Source: World Bank. *Doing Business 2009*
i / Percent of assets.

In Mexico, the new Bankruptcy Law (Ley de Concursos Mercantiles, or LCM) added some major improvements to the old Bankruptcy and Suspension of Payments Law (Ley de Quiebras y Suspensión de Pagos, or LQSP) because it provides incentives for restructuring and establishes deadlines for creditor claims to be frozen. In fact, between June 2007 and June 2009, the total length of a bankruptcy proceeding was reduced from 33 to 20 months. Nevertheless, specialized courts are still required to reduce the costs associated with this process. Lastly, the current payment preference order discourages financial creditors from initiating a bankruptcy proceeding, because the legal regime gives preference to labor and fiscal obligations.[3]

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1. André, M. (2009) *Financial Crisis? We look at the effects*. Eurofenix. INSOL Europe Journal. No. 34.
2. World Bank. *Doing Business 2009, Section Closing a Business.*
3. López Velasco y Torres Cepeda (2004) *La ley de concursos mercantiles en México: algunas reflexiones a cuatro años de su entrada en vigor* Ensayos-Volumen XXIII, No. 2 UANL.

Box 35

Risk Premium

Risk management systems enable us, among other things, to perform loan risk pricing. Banks may use risk models to estimate the prices or lending rates applicable to different types of loans granted, according to the costs and risks assumed. Thus, a lending rate must include the costs associated with making the loan in question, as well as those stemming from the creation and maintenance of reserves necessary to absorb expected defaults, if any. The interest rate must also be sufficient to pay for the cost of the funding required to extend the loan, including the cost of the economic capital necessary to absorb unexpected losses.

A Model for Obtaining Loss Costs[1]

The cost of credit can be broken down into two elements: the first would be the cost of originating the loan and maintaining the committed funds. This component depends on market conditions and the terms on which the bank can obtain the additional funding it needs to make the loan; typically, the reference rate, *r*. The second element is linked to the credit quality of the borrower and the risk incurred by including the loan in the bank's portfolio. To analyze these costs, we must break down the lending rate into one component that represents the cost of the funding and another that corresponds to the risk assumed: $r+d_{EL}$. This element is called risk premium. The risk premium for a loan with a default probability of PD and a recovery rate[2] of $1-LGD$ should be sufficient for the bank to be able to recover the cost of financing that loan. The bank will receive revenues from all non defaulting loans, 1-*PD*, and what it recovers from those that do default, (1-*LGD) PD*:

$$(1+r+d_{EL})[(1-PD)+(1-LGD)PD]=1+r$$

where ***r*** is the benchmark interest rate, d_{EL} the risk premium, and the expression between brackets is reduced to 1-*PD***LGD*. The risk premium should be sufficient to cover the expected loss on the loan. The cost can vary depending on changes in the loan recovery rate, default probability or funding cost (or benchmark interest rate). The risk premium should not, in principle, be affected by the characteristics of other loans that form part of the bank's portfolio. When looking at the risk of an overall loan portfolio, it is not enough to factor in expected losses; a capital reserve should also be created to cover *unexpected* losses. The creation of this reserve not only conforms to best risk management practices, but also helps reduce the damage the bank may suffer due to external shock. This reserve is known as economic capital, and banks can include it in the risk premium of each loan. Capital cost is different from funding costs. The nature of the portfolio where the loan is located may also be important. Therefore, the cost of the credit is made up of the cost of obtaining the funding, plus the cost of creating the economic capital reserves. To include this capital reserve in the risk premium, let us assume that the cost ***c*** per peso of credit granted is given by:

$$C=(1-\alpha)(1+r)+\alpha(1+r_K)$$

where α represents the fraction of the credit covered by capital, while $r_K$is the capital cost. Consequently, the following relationship is verified:

$$(1+r+d_{EL}+d_{UL})\times[1-PD*LGD]=C$$

In the above equation, d_{UL}represents the cost due to loss variability, generally called unexpected loss. Thus, using the above exercise, the following are identities for the risk premium:

$$d_{EL}=\frac{PD*LGD(1+r)}{1-PD*LGD}$$

and

$$d_{UL}=\frac{\alpha(r_K-r)}{1-PD*LGD}$$

The lending rate charged on the credit should then be given by:

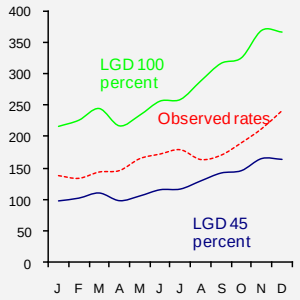
$$Tasa=r+d_{EL}+d_{UL}$$

The value of αshould be a measure related to the credit's risk contribution to the portfolio. For example, under Basel I, $\alpha$was equal to 8.0 percent, while for the New Basil Capital Accord[3] (Basel II, which uses a version of Vasicek's model), $\alpha$is equal to the *VaR* of the credit at 99.9 percent. From these relationships, we can infer that for a bank that determines its lending interest rates in this way, the factors that affect these rates are: the level of the funding rate, the cost of capital, the borrower's risk and the relationship it has with the rest of the loan portfolio. Even when banks are *price takers* in rates, the risk premium will be used to allow the bank to identify (or reject) loans for which the market rate is not enough to cover the associated risks.

Analysis of Risk Premium of Commercial Banks

Using the model presented here, we can analyze the breakdown of lending rates charged by commercial banks. For this exercise, we used as reference rate ***r*** the 28-day Interbank Equilibrium Interest Rate (TIIE28), and as capital cost the subordinated debt rates. To determine the amount of economic capital the bank must maintain, we used the requirement established by Basel II, using the internal rating basis (IRB) method. This requirement depends on the type of loan being considered. Once the default probability of the borrowers is defined, the only parameter that has to be defined is the loss given default the loan (LGD). Given the complexity of estimating *LGD* without more data, two scenarios were used: in the first, in line with what Basel II proposes,[4] a loss of 45 percent was used, and in the second, a more extreme case, a loss of 100 percent. As can be seen in Graph 1, the lending rates charged by the bank are between these two scenarios.

Graph 1
Basis points over TIIE28



Source: Banco de México

1. See for example Resti, A. and A. Sironi (2007), "Risk Management and Shareholders' Value in Banking: From risk measurement models to Capital allocation policies", Wiley; and also Bluhm, C. et al. (2003) "An Introduction to Credit Risk Modeling", Chapman and Hall/CRC.
2. The loss given a default or *LGD* is the proportion of the value of the loan which at the time of default will ultimately not be recovered.
3. Basel Committee on Banking Supervision, "International Convergence of Capital Measurement and Capital Standards", Jun. 2006.
4. Paragraph 287 of the New Basel Capital Accord.

In synthesis, to understand the evolution of lending rates it is necessary to analyze the behavior of their main components. In addition, it should be kept in mind that these components are not only affected by competitive conditions in the credit market, but also by variations in the general economic environment. Therefore, it is perfectly feasible that although effective measures might be adopted to enhance transparency, competition, and access to credit services in order to spur a reduction in lending rates, the latter will increase if the economy as a whole enters into a recessive phase that increases delinquency levels and, as a result, risk premiums.

The following section presents the interest rates and risk premiums corresponding to three specific markets: the credit market for non-financial private firms, the mortgage loan market, and the credit card market. To better understand the evolution of lending rates, they were calculated based on the loan-loss reserves for the entire portfolio, an *ex post* risk premium, and a risk-adjusted interest rate (Box 36)[5]. These indicators incorporate the result of the central bank's interest rate policies taking into account existent conditions and weighing recent loans granted[6]. The results obtained for the three markets differ as their competitive structure, risks and costs also vary.

Commercial Loans

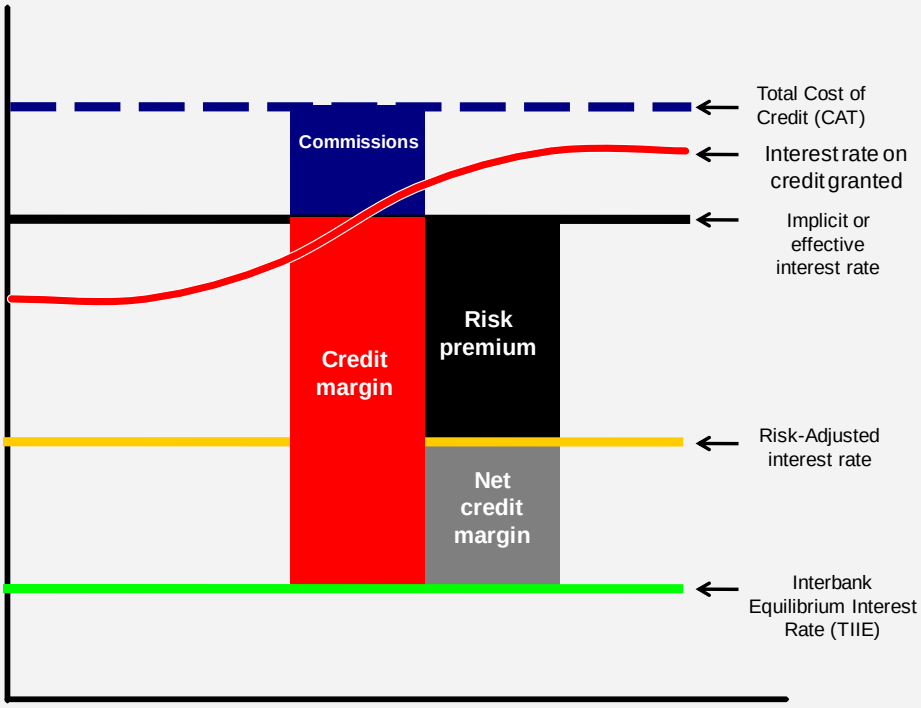
The average interest rate on commercial loans increased as of June 2008 (Graph 85a), due to mounting risk aversion, a higher cost of capital internationally, and growth in the loan portfolio's delinquency index. The increase in this index during the second half of 2008 resulted in a rise in the average yield on the commercial loan portfolio (implied interest rate), such that the risk-adjusted interest rate was slightly higher, on average, than the average opportunity cost for the six largest banks of lending these resources in the interbank market (Graph 85b and c). The average increase in interest rates was reversed during the first quarter of 2009 due to the decrease in the TIIE.

[5] The risk premium mentioned in this paragraph differs from the one considered in Box 35, since the latter is calculated *ex ante*.

[6] For the calculations described, the implied interest rate, or average interest rate, that results from dividing interest generated during the corresponding period by the average total portfolio of the same period is used. For the risk premium, the loan-loss reserve balance is divided by the total portfolio. To avoid seasonal effects, it is possible to calculate the previously mentioned indicators using the last 12 month average, as is the case for the information presented in this section.

Box 36

Interest Rates, Credit Margin and Risk Premium



Total Cost of Credit (CAT). Is the cost of financing in annual percentage terms. This indicator incorporates all the commissions, fees and taxes inherent to the credit. Thus, the CAT is calculated using the Internal Rate of Return (IRR) on a compound annual basis.

Interest rate on credit granted: Refers to the average of the interest rates on the loans extended during the reference period. Expressed in simple annual terms.

Implicit or effective interest rate: Refers to the average interest rate on the current loans during the reference period. This rate is equal to interest accrued in the reference period, divided by the average balance of the current loan portfolio. For credit cards, the effective rate includes credit extended through the revolving credit line as well as the interest rate on promotions. This rate is expressed in simple annual terms.

Interbank Equilibrium Interest Rate (Tasa de Interés Interbancaria de Equilibrio, TIIE): This is the rate at which banks lend funds to each other in the interbank market. For banks that do not have enough deposits to fund their lending, TIIE is the rate at which they can borrow the shortfall on the interbank market. For banks whose deposits exceed their loan portfolio, TIIE is the interest rate at which they can lend their excess on the interbank market (opportunity cost). In both cases, the TIIE means the cost of the funding needed to lend.

Risk-Adjusted interest rate: This rate is calculated by subtracting the risk premium from the lending interest rate.

Credit margin. Also known as "spread over TIIE" is equivalent to the additional gross income a bank can obtain on a loan over what it would have obtained had it put the loan on the interbank market. But this financial margin or spread over TIIE does not correspond to profits for non financial companies. This is because of the foreseeable likelihood that a proportion of borrowers will not pay off their loans.

Net credit margin: This is the credit margin adjusted for the risk banks incur due to the difference between the risk-adjusted lending rate and the interbank interest rate (TIIE). This concept is equivalent to profits for non-financial companies, because it discounts the credit risk. In other words, the indicator takes into account the likelihood that some borrowers will default.

Risk premium: Represents the expected loss for a lender resulting from the behavior of its borrowers. A proxy for this concept can be obtained by dividing provisions created against results for a given period by the average current credit portfolio in that period.

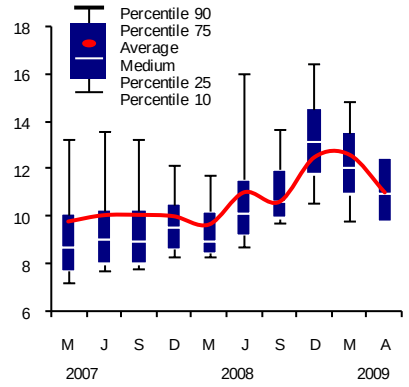
The decrease in economic activity and increase in uncertainty have led to growth in the delinquency index, investment projects becoming riskier, and a rise in the cost of funds. All these factors have brought about increases in the interest rates banks charge when granting loans to firms (Graph 85).

Higher interest rates on the commercial loan portfolio can thus be attributed to a series of factors, including the relative scarcity of funds, as for many companies it was more difficult to obtain credit from alternative sources (the external market, for example), more expensive funding, and an environment marked by greater risk (the non-performing loan portfolio practically doubled over two years, see the section on Risks).

Graph 85
Interest Rates, Credit Margin and Risk Premium of Loans to Non-Financial Companies
Six Largest Banks

a) Range of Interest Rates on Credit Granted during the Quarter

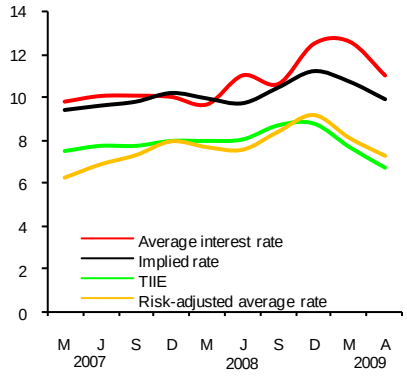
Percentage points



Figures as of April, 2009.
Source: Banco de México.

b) Average Interest Rates on Credit Granted during the Quarter

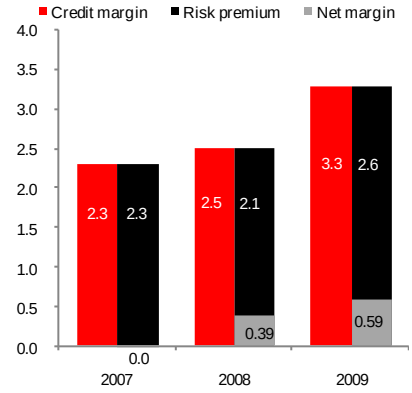
Percent



Figures as of April, 2009.
Source: Banco de México.

c) Credit Margin, Risk Premium and Net Credit Margin on the Loans Granted

Percent



Figures as of April, 2009.
Source: Banco de México.

Mortgage Loans

In the past few years, banks have been granting an increasingly large percentage of fixed-rate mortgage loans in a market characterized by fierce competition[7]. Given that these are long-term loans, the benchmark rate should also be long-term, and so the yield on the 10-year M bond is generally used. The average interest rate for these loans has been relatively stable, as has the reference rate and risk premium (Graph 86a).

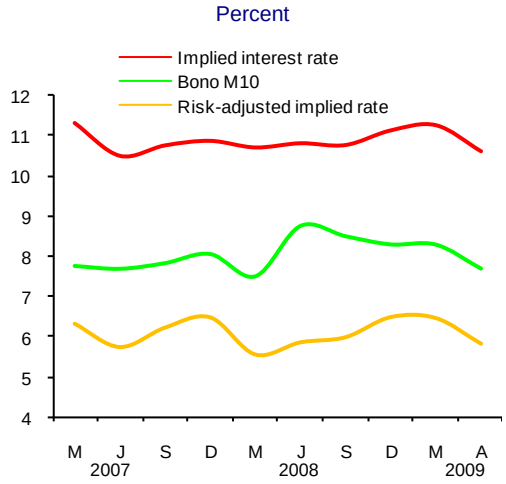
Once the risk premium is obtained, the risk-adjusted rate for mortgage loans is set below the benchmark rate, the result being that the net credit margin is negative for the entire period under consideration. This result can be attributed to credit supply competition among several intermediaries. At the same time, although loan delinquency has been increasing in recent years, its growth has not been proportionate to growth in consumer credit or loans to firms, which explains

[7] See the section on competition in the 2006 Financial System Report.

the stability in risk premiums. Furthermore, in the case of mortgage loans banks have collateral, which while not always easy to claim, nevertheless reduces the impact of the projected loss.

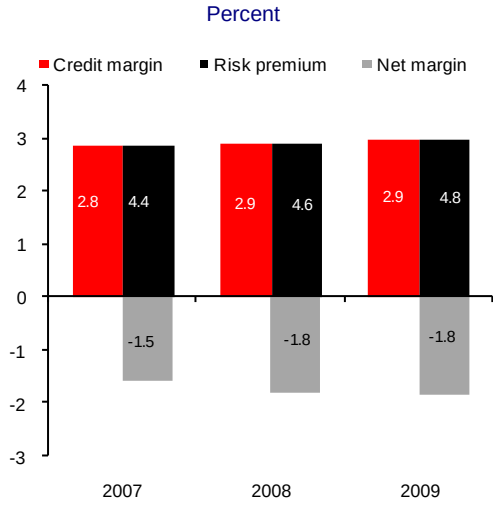
Graph 86
Interest Rates, Credit Margin, and Risk Premium of Housing Loans
Six Largest Banks

a) Average Interest Rate on Loan Granted during the Quarter



Figures as of April, 2009.
Source: Banco de México.

b) Credit Margin, Risk Premium and Net Credit Margin on the Loans Granted



Figures as of April, 2009.
Source: Banco de México.

Credit Cards

High total annual cost (CAT) levels observed for some loans, particularly in credit cards, have given rise to proposals to modify some of the concepts of the methodology used to calculate CAT. One of the main components of CAT is the interest rate. In the current methodology, the interest rate in the loan contract signed between the issuing bank and the card holder is used. This interest rate corresponds to the maximum rate a loan originator could charge on the loan at a given point in time. However, it is not representative of the cost incurred by most users of credit cards (Box 37).

Box 37

Calculating Total Cost of Credit (CAT) for Credit Cards

The Law for the transparency of financial services (Ley para la Transparencia y Ordenamiento de los Servicios Financieros, or LTOSF), establishes the obligation to inform the CAT of all loans of less than 900,000 inflation-adjusted units (UDIs) and home mortgage loans of any size. CAT is defined as the cost of financing, presented in annual percentage terms, which for comparisons and information purposes it includes all costs and expenses generated by the loans , such as: interest, commissions, insurance, discounts, payments, and any other obligatory charge of the loan.

Most developed countries use a concept similar to CAT, although the ways in which they are calculated differ. In the United States, Canada and Australia, the internal rate of return (IRR) is calculated for the payment period (monthly, quarterly, etc.) and is annualized in simple terms, while in the European Union and some countries of Latin America it is annualized in compounded terms (Table 1).

The concepts that make up the calculations of the indicator also vary from country to country. Specifically, the costs related to some commissions, insurance or taxes are explicitly excluded or not applied. Mexico adopted the methodology used in the United Kingdom. The benefit of the CAT is that it enables people to compare credit offerings by various financial institutions, since all of them are obligated to use the same methodology and assumptions to express the total cost in a single indicator.

Table 1

Country	Indicator	Compound Rate	Includes Annual Fee (Credit Card)
Unites States	APR	No	No
Canada	APR	No	No
Australia	Comparison Rate	No	Yes
European Community	APR	Yes	Varies by country*
Spain	TAE	Yes	No
United Kingdom	APR	Yes	Yes
Argentina	Effective annual rate	Yes	Yes
Chile	Effective monthly rate	Yes	n.a.
Peru	Cost effective annual rate	Yes	Yes
Mexico	CAT	Yes	Yes

CAT on Credit Cards

The way in which CAT is currently calculated on credit cards has given rise to distortions that prevent it from fulfilling its purpose of allowing a comparison of credit offerings from various intermediaries. These distortions also prevent it from encouraging competition in the market. To deal with this problems, some of the items included in the calculation methodology for CAT may need to be adjusted.

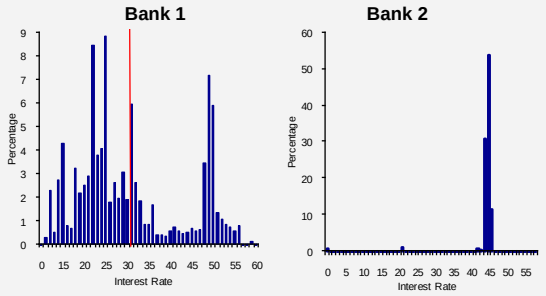
Maximum Interest Rate as a Basis for CAT Calculation

One of the central components of the CAT is the interest rate on the loan. The rate used in the current methodology for the credit card market is the maximum at which the issuer is willing to lend to the borrower. As this is the CAT used for advertising, it looks as if the institutions extend all of their credit at this rate.

There are various cases in which credit card users pay rates lower than the maximum. For example, a substantial proportion of credit goes to clients who are current with their payments, who are frequently charged rates lower than the maximum. Additionally, institutions offer numerous promotions with interest rates below the maximum to benefit consumers. Also, some cardholders pay off their credit balance in full before the cutoff date. These consumers, called "totalers," obtain short-term credit at no cost at all. Thus, different users of the same type of product or card may have different interest rates. Furthermore a cardholder can have different interest rates associated with the same line of credit, depending on how he or she uses it.

This means that the interest rate on a credit card is not the same for all borrowers, since much of the credit is extended at rates below the maximum. Credit cards offered by one institution may have a wide variety of rates. The following graphs show the breakdown of credit extended at different rates by two banks.

Percent of Credit Card Credit Extended at each Interest Rate Level[1/]



1/ The information that appears in the two graphs was intended for illustrative purposes; it does not correspond to any particular financial institution.

These graphs show that both institutions extend most of their credit at rates below the maximum. We can also see that, while Bank 1 extends credit at very varied rates (probably based on the risk profile of its borrowers), Bank 2 concentrates most of its credit at relatively high interest rates.[1] When the CAT is calculated using maximum rates, the Total Cost for Bank 1 would be 73 percent, and for Bank 2, 69 percent. This fails to reflect the fact that Bank 1 lends out most of its credit at lower rates than Bank 2. What this means is that the CAT calculation using the current methodology does not properly identify the institution that, on average, extends cheaper credit. It is therefore not helpful in encouraging competition.

Weighted Average Rate as a Basis for CAT

For this reason, it is convenient to use another benchmark rate to calculate the CAT, which better captures the level of interest rate distribution across a credit portfolio. One possibility is to use the weighted average interest rate in the corresponding loan portfolio, instead of the maximum rate. The weighted average is the average rate at which the institution maintains its credit portfolio. According to this indicator, and using the same examples, Bank 1 extends credit at a weighted average rate of 28 percent of the unpaid balance (red line on the graph). In contrast, Bank 2 extends credit at a weighted average rate of 44 percent. The corresponding CATs are 39 percent and 66 percent, respectively. Thus, the CAT based on the weighted average rate better captures the average price at which banks extend credit through credit cards.

Comparison of CAT Calculated with Maximum Rate, and CAT Calculated with Weighted Average Rate

Bank	Contract rate (max)	TAC with maximum rate	Weighted rate by balance	TAC based on weighted rate by balance
Bank 1	48%	73%	28%	39%
Bank 2	46%	69%	44%	66%

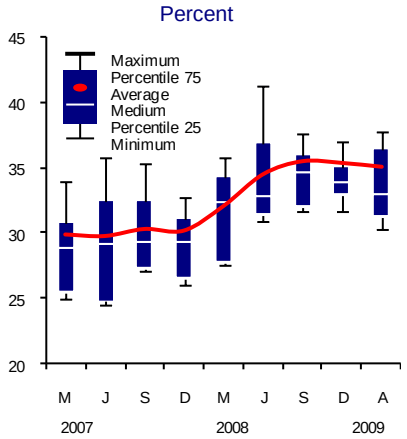
The weighted average is not the only alternative for this calculation. Another possibility would be the mean. The CAT should be based on an interest rate indicator that captures the distribution of the cost of credit from the institution. This would better reflect credit conditions and enable consumers to make more informed decisions. Changing the benchmark rate used to calculate the CAT would improve transparency and promote competition among financial intermediaries, because it would allow financial service users to compare and select cards offering the lowest CAT.

The average interest rate on the revolving loans granted through credit cards increased in the second quarter of 2008, but remained constant during the second half of that year (Graph 87a). Nevertheless, the increase in the effective interest rate (the average interest rate on revolving loans and special promotional offers) was lower and tended to diminish toward the end of 2008 (Graph 87b).

As opposed to the commercial or mortgage loan portfolio, growth in the interest rate on the consumer loan portfolio is more a reflection of increased risk perception due to a lack of collateral on credit. This increase in interest rates was also reflected in the credit margin, which rose from 18.3 to 19.9 percent (Graph 87c). The main reason for the increases in rates has been the rise in the risk premium, with the result that banks' net credit margin has decreased over the past two years, but remains positive. The increase in risk premiums is the result of a greater weakening of the credit card portfolio, due to both its rapid growth in the past as well as a more challenging economic environment.

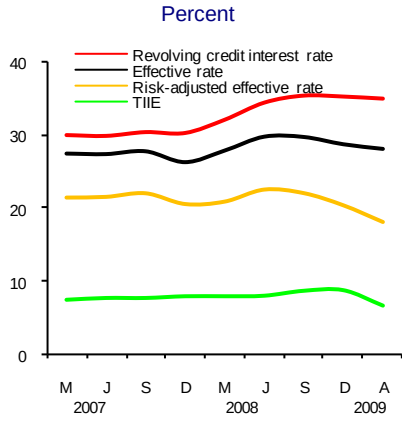
Graph 87
Credit Card Financing (Six Largest Banks)

a) Average Range of Interest Rates on Revolving Credit Granted during the Quarter



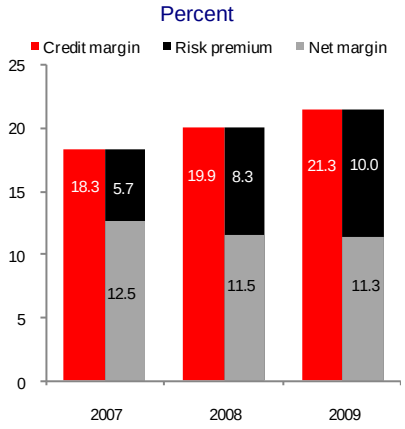
Figures as of April, 2009.
Source: Banco de México.

b) Average Interest Rates and Risk Adjusted Interest Rates on Revolving Loans Granted during the Quarter



Figures as of April, 2009.
Source: Banco de México.

c) Credit Margin, Risk Premium and Net Credit Margin on Revolving Loans Granted



Figures as of April, 2009.
Source: Banco de México.

7.2. Behavior of bank fees and commissions

An analysis of bank charges is complicated because collection concepts and mechanisms are very diverse. While interest is the payment that must be made in order to use capital, commissions are payments that the clients make to use different bank services. Banks charge commissions related to credits, debits and services. Depending on the type of service offered, commissions can be charged for transaction or use, access to or cancellation of a service, and to penalize consumer practices. Commissions can be charged with different frequencies and their amount can be established in advance (fixed) or be based on the value of the transaction. The amount of the commissions charged can also vary between products without regard to the type of service offered.

Some of the criteria used by banks to determine the level of the commissions are the type of account, the vehicle used to carry out the transaction (ATM, teller window, telephone, Internet) and the infrastructure employed in the transaction (same or another bank). Banks do not establish commissions in an isolated way; rather they bare a close relationship to the characteristics of the product or service they are part of. Therefore, commissions are not sometimes charged for certain services, such as withdrawals undertaken at the bank's own ATMs, or the issuance of a certain number of checks. The costs associated with providing these services are recovered through higher charges for other services. This means that in providing bank services, crossed subsidies occur among services and clients[8]. The business strategies of each bank determine the structure of their commissions.

The multiplicity of products and bank services, their different characteristics, and the diversity of collection mechanisms makes comparisons difficult. Therefore, mechanisms have been sought to simplify the way commissions are charged and to make them transparent, while trying not to inhibit the development of new products and services that further benefit financial service users.

Trend in some representative fees and commissions

In this section we discuss the evolution of some of the commissions related to bank products considered to be the most representative of the market. With this in mind, indicators were created to evaluate the trend of some specific commissions in aggregate terms; these indicators correspond to what are termed maximum commissions[9] and effective fees[10]. Maximum and real commissions have shown a downtrend in real terms over the past few years (Graph 88 and 89).

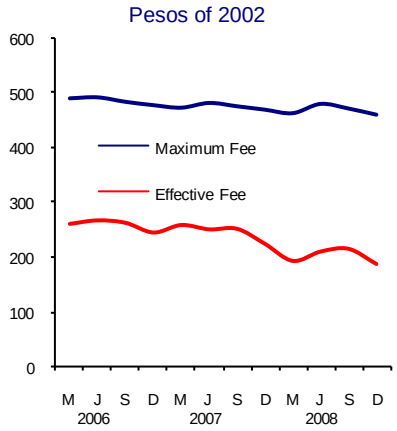
8 A crossed subsidy occurs when the losses incurred in one activity are compensated with the earnings obtained in another.

9 Since 2003, the banks report the maximum commissions for some bank products to Banco de México. The maximum aggregate commission results from weighing the maximum commissions reported by the market share of each bank. Market share is defined as the percentage of branches versus the system total; this ratio has remained stable over time.

10 The effective fee is obtained by dividing aggregate revenue for the industry from a specific commission by the number of transactions undertaken (or products furnished) by banks as a whole.

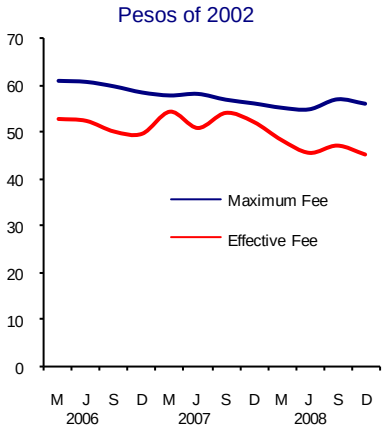
Graph 88
Maximum[1/] and Effective Fees[2/] by Type of Service

a) Annual Credit Card Fee



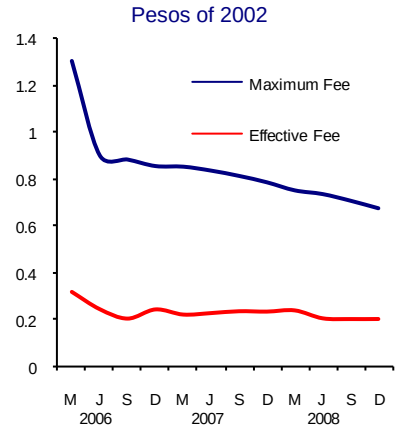
Figures as of December, 2008.
Source: Banco de México.

b) Maintenance and Opening of Transaction Accounts[3/]



Figures as of December, 2008.
Source: Banco de México.

c) Commission for Electronic Fund Transfer (TEF)

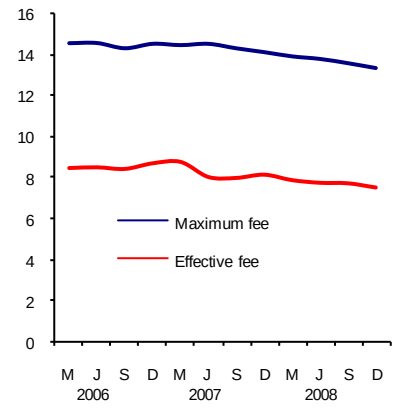


Figures as of December, 2008.
Source: Banco de México.

1/ The maximum aggregate commission is obtained by weighing maximum commissions by the market share of each bank.
2/ The effective fee is obtained by dividing the aggregate income from a commission by the number of aggregate transactions.
3/ Includes checking accounts and current accounts that do not generate any type of interest, excluding basic accounts.

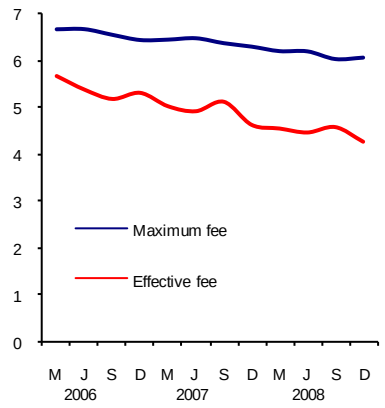
Graph 89
Commissions on the Use of Non-Basic Transaction Accounts

a) Cash Withdrawal from Other Banks' ATMs



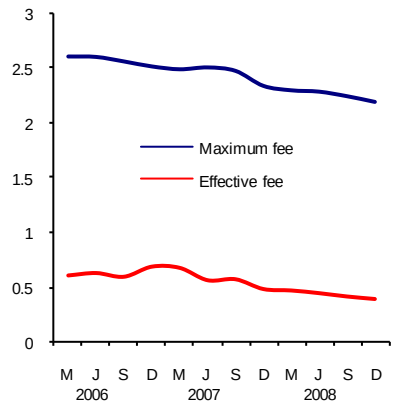
Figures as of December, 2008.
Source: Banco de México.

b) Consultation of Bank Balances in Other Banks' ATMs



Figures as of December, 2008.
Source: Banco de México.

c) Cash Withdrawal from same Bank's ATM



Figures as of December, 2008.
Source: Banco de México.

Interbank Fees and Discount Rates

In 2008, 36 percent of commercial bank income corresponds to the use of credit cards. Of the income from such cards, 62 percent corresponds to what are known as discount rates (DR).[11]

Discount rates are determined by each bank based on the characteristics of each business and the competition they face in installing Point-of-Sale Terminals (POS). The objective of the POS is to acquire "at a discount" all the receipts signed by users of credit and debit cards every time they acquire a good or service using that means of payment in the affiliated business.

Discount rate levels are also based on Interbank Fees (IF)[12], which are mutually agreed upon by all banks participating in the credit card market. In 2005, the Association of Mexican Banks (ABM) began to review interbank fees with the purpose of promoting greater use of credit and debit cards, as they represent a more efficient means of payment than cash. Banco de México has actively participated in this process, based on the authority conferred on it by the Law for the Transparency and Regulation of Financial Services (Ley para la Transparencia y Ordenamiento de los Servicios Financieros, LTOSF).[13]

Interbank fees vary for 22 businesses categories and a distinction is made between transactions using credit and debit cards[14]. The interbank fees that went into effect in 2008 represented an average reduction on 2007 IF levels of 12.5 percent on credit card transactions and 9 percent on debit card transactions. Thus, between 2005 and 2008, interbank fees came down by 80 and 121 basis points for credit and debit card transactions, respectively.

The adjustment in IFs between 2005 and 2008 was reflected in an average contraction in the discount rate of 35 and 59 basis points on credit and debit card transactions, respectively[15] (Graph 90a and b). However, the reduction in interbank fees has been transmitted to discount rates unequally based on the prevailing level of competition among companies in the different business categories.

Graph 90c shows the Transmission Index[16] for different business categories. As can be seen, the biggest impact has occurred in debit cards, with

[11] The DR is equal to the percentage of the value of a transaction that an acquiring bank "discounts" from its affiliated business each time it obtains the credit card receipt signed by a card holder. The acquiring bank purchases these receipts at a discount and they are subsequently sent to and charged by the bank issuing the card .

[12] The IF is the commission that the bank that issues a credit or debit card charges to the acquiring bank of a business each time the former settles the transactions carried out by its clients with its cards in the business affiliated to the acquiring bank.

[13] For further details see the 2006 and 2007 Financial System Reports.

[14] For debit cards, an interbank fee ceiling of 13.5 pesos per transaction has been set.

[15] The data on the discount rates come from the survey "Module for Companies that Use and Receive Payments Other Than Cash (MERP)" that the INEGI undertakes annually for Banco de México. The sample includes about a thousand companies that accept payments with credit and debit cards, distributed in ten of the business categories defined by the ABM in the application of IFs.

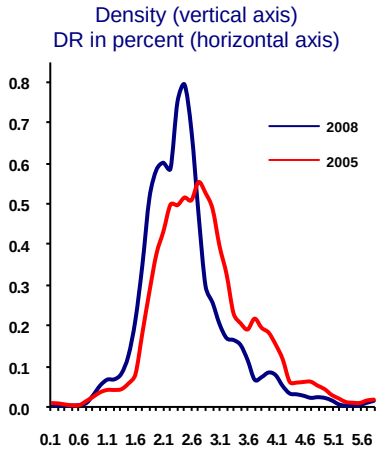
[16] The transmission rate (TI) for a business category *i* is defined as follows:

$$IT_i = \frac{TD_{2008} - TD_{2005}}{CI_{2008} - CI_{2005}}$$

the exception of supermarkets and airlines where its effect on the discount rate of the payments made with credit cards has been greater.

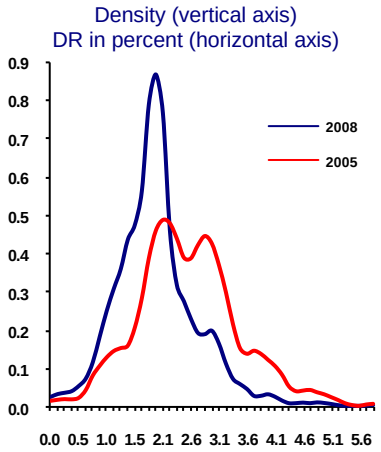
Graph 90
Discount Rates

a) Distribution of Discount Rates for Credit Cards



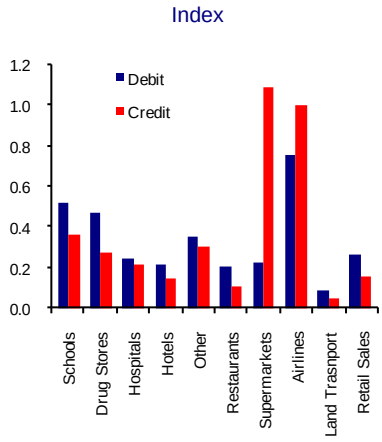
Figures as of December, 2008.
Source: Banco de México and INEGI (2006,2007), "Survey of Companies that Use and Receive Payments Other than Cash".

b) Distribution of Discount Rates for Debit Cards



Figures as of December, 2008.
Source: Banco de México and INEGI (2006,2007), "Survey of Companies that Use and Receive Payments Other than Cash".

c) Transmission Indices



Figures as of December, 2008.
Source: Banco de México and INEGI (2006,2007), "Survey of Companies that Use and Receive Payments Other than Cash" “.

Commission Registration

The LTOSF requires banks, Sofoles and regulated Sofomes to register with Banco de México the commissions they wish to modify (Box 38). The registration of the intention to modify the commissions does not represent an authorization to do so, as in the final analysis, banks, Sofoles, and Sofomes have the freedom to set the commissions they charge. However, Banco de México has the authority to formulate and publish observations concerning registration requests. This procedure has proven relatively effective at discouraging banks from hiking some commissions, which due to their high amount or their nature, would be difficult to justify.

Banco de México makes observations when the commissions banks, Sofoles and Sofomes seek to be registered are deemed contrary to best banking practices. Efforts are generally made to ensure commissions are transparent, are only charged for services actually provided, that more than one commission is not charged for the same service, and they do not prevent clients from migrating from one bank to another. Commission registration began in June 2008. Between then and the end of the first quarter of 2009, there has been a monthly average of 400 registrations, 55 percent of them involving the introduction of new products. Furthermore, 71 percent of total registration requests corresponded to deposit services and 14 percent to credit card services (Table 14).

If TI (transmission index) is equal to 1, it means that the reduction in interbank fees was fully transferred to the discount rate (DR). If the index is greater than 1, the discount rate decreases more than the declines in interbank fees. Finally, if the index is lower than 1, this indicates that transmission is partial.

Table 14
Fee Registration Statistics

Product Type	From July, 2008 to March, 2009		
	Existing product	New product	Total
Deposit product	1,180	1,583	**2,763**
Credit card	363	204	**567**
Other loans 1/	177	362	**539**
Customer service in general	13	1	**14**
Total	**1,733**	**2,150**	**3,883**

Figures as of March, 2009.
Source: Banco de México.
1/ Includes mortgages, car loans, ABCD, personal loans and PyMEs.

Box 38
New Restrictions on Retail Banking Fees Charged

One of Banco de México's main objectives is to promote the healthy development of the financial system. Transparency in the retail banking fees that institutions charge to their customers, competition among institutions and proper protection of the public interest are all central to a healthy system. However, the complex evolution achieved by the banking industry today makes it difficult to accomplish all the tasks above. For this reason, Banco de México decided to introduce some restrictions on how fees are set, and encouraged banks to charge them in a more orderly fashion.

The Law for the Transparency and Regulation of Financial Services (Ley para la Transparencia y Ordenamiento de los Servicios Financieros, or LTOSF), issued by the Mexican Congress in late 2007, established that Banco de México should keep a record of the fees that banks, Sofoles, and regulated Sofomes charge the public, and their modifications.[1] This registry allowed for some principles on the collection of fees to be established, including:

1. Fees should be clear and transparent.
2. Fees should be applied only to services effectively supplied and to transactions performed by clients.
3. Fees should not obstruct competition or consumer's mobility.

On the basis of these principles, Banco de México identified a series of inappropriate practices, and issued regulations to restrict them.[2] Among the fees that must not be charged once the new regulations take effect are the following:

1. In deposit accounts, like check and payroll accounts, banks may not charge maintenance fees and fees for holding balances below the minimum required at the same time.
2. A client may never be charged for having deposited a check into his/her account that is returned for whatever reason.
3. When a financial institution requires borrowers to open a deposit account in order to make payments on the loan, it may not charge fees on the account for the following concepts: i) account opening; ii) maintenance fee; or iii) for holding a balance below the minimum required.
4. A client must not be charged fees for exceeding or attempting to exceed his/her debit card balance. The law establishes a similar provision for credit cards.
5. A fee may not be charged for the cancellation of deposit accounts.
6. A fee may not be charged for the cancellation of credit cards or debit cards.
7. A fee may not be charged for the cancellation of direct debits.
8. A fee may not be charged for the cancellation of online banking services.
9. In the case of funds transfer orders, financial institutions may not charge different fees based on the amount of the transaction the client is requesting.

These restrictions are expected to encourage greater transparency and heightened competition in the industry, and thus benefit consumers throughout the system.

_____

1. See observations on fees, issued by Banco de México based on the record base at the following address: http://www.banxico.org.mx/publicaciones/JSP/SFcomisiones.jsp.
2. See Bulletin 17/2009, directed to Credit Institutions, Limited-Purpose Financial Corporations and Regulated Multiple-Purpose Financial Corporations.

Up to March 2009, Banco de México had issued 10 observations regarding commissions commercial banks had implemented, despite the Central Bank having questioned the adequacy of their registration justification (Table 15). In 29 cases, banks modified or withdrew their original requests when Banco de México informed them they would be subject to public scrutiny.

Table 15
Observation Statistics

July, 2008 to March, 2009	Total
Pre-observations	**67**
Dismissals by banks	29
Satisfactory justifications	28
Observations	10

Figures as of March, 2009.
Source: Banco de México.

7.3. Main Changes to the Legal Framework

The perception that interest rates and commissions charged by banks are high in Mexico, coupled with a rise in interest rates on some loans due to the international financial crisis, has once again drawn the attention of analysts and the general public. The importance of this issue led to different bills being proposed in Congress to respond to the complaints raised by financial service users. Some of the legislative proposals even contemplated interest rates and commission caps. However, due to the negative experience of countries where such ceilings have been implemented, which have mainly translated into a reduction in bank credit to lower-income sectors of the population[17], in April 2009, Congress approved different amendments to the legal framework without setting caps. Thus, modifications were approved to the Law for the Transparency and Regulation of Financial Services (LTOSF), the Law for the Protection and Defense of Financial Services Users (LPDUSF), the Credit Institutions Law (LIC) and other legal provisions in order to further safeguard the public interest, and encourage transparency and competition in the supply of financial services.

Modifications to the Legal Framework

One of the most important reforms deals with strengthening the powers of the National Commission for the Protection and Defense of Financial Service Users (CONDUSEF). With the modifications issued in June 2009, powers that were previously conferred on the National Banking and Securities Commission (CNBV) were transferred to CONDUSEF based on the LTOSF. The idea behind these legal modifications was that the CNBV could more efficiently channel its resources toward priorities conferred upon it by different financial laws, such as the prudential regulation and supervision of financial institutions. In addition, the new powers conferred on CONDUSEF will allow it to issue regulations, supervise the financial institutions and, depending on the circumstances, impose sanctions in relation to issues contemplated in the previously mentioned LTOSF, decisions that will be made public.

Different modifications to legal provisions were also introduced in relation to the protection and defense of financial service users, the most

[17] See Box 35 in the 2007 Financial System Report.

important being the extension of CONDUSEF's competence to the defense and representation of individual users in disputes with financial institutions concerning transactions and services for up to three million UDIs. In the case of insurance transaction disputes, the maximum amount is six million UDIs. This will enable the majority of financial service users to benefit from the protection and defense offered by the Commission.

Some of the fields in which CONDUSEF is authorized to issue regulations, in accordance with the modifications to the above-referred legal dispositions, are:

I. Defining activities that are at odds with healthy practices in relation to the offer and marketing financial services and operations.

II. Establishing procedures for terminating financial services, lending and borrowing transactions.

III. Issuing provisions establishing the terms and conditions governing financial service advertising.

IV. Establishing the requirements that bank account statements and receipts should meet, including clarity and simplicity.

V. Determining the requirements that credits, debits and services contracts should adhere to.

In order to encourage competition among banks, the reforms contemplate making requirements for terminating loan contracts with banks more flexible and also enable credit or deposit products to be transferred from one bank to another of the client's choice at no cost.

Another important modification is the introduction of measures aimed at promoting good practices in the granting and handling of credit cards to avoid abusive behavior. Some of the measures banks must adhere to include: 1) only granting credit cards to people aged 18 or above, who have previously requested them and have sufficient payment capacity; 2) increasing the credit limit only when the client has accepted it, which should be previously communicated by the bank; 3) agreeing to a single ordinary maximum interest rate, and, depending on the circumstances, a single maximum moratorium interest rate; 4) calculating interest on average daily unpaid balances; and 5) not charging an overdraft fee. In addition, the reforms establish banks' obligation to give clients at least 30 days notification of any increase in interest rates charged.

At the same time, the LTOSF confers new powers to Banco de México to issue provisions regulating the minimum payment banks can require on credit cards. The central bank should ensure there are no "negative amortizations"; in other words, that the principal does not increase as a result of the minimum payment being insufficient to cover interest or any other accessory payment, and that debts be covered within a reasonable timeframe. The aim of this is to prevent banks from establishing minimum payments that are so low they could generate problems of excessive indebtedness among card holders.

Regarding disclosure, the reforms state that banks must include in contracts, account statements and advertising related to credit cards, information about the period of time, as of the date the account statement is issued, it would take the client to settle his or her debt only covering the minimum payment. They must also inform the client that if the payment deadline falls on a non-business day, he or she will be able to make the payment the following business day.

The reform also contemplates the adoption of common criteria for deposit and credit transaction information by banks in order to make such data more accessible and facilitate its comparison for clients. As a result, banks must make available to clients in their branches or offices, through posters, lists, and brochures, information relative to commission amounts, type and frequency, so they can compare the prices of similar services offered by different banks. In addition, bank account statements must include information that facilitates a comparison of the credit products they offer.

The LTOSF establishes that the supervision and monitoring of financial entities' compliance with its provisions lies in the competence of CONDUSEF and Banco de México, and in the case of commercial companies, with PROFECO.

Regulation of bank agents

In December 2008 the CNBV introduced different modifications to the section "Contracting services or commissions with third parties" of its regulation in order to enable banks to receive deposits from the public and conduct banking operations outside of their offices by contracting the services of third parties, or commission agents. This effectively enhances the range of options available to the public in products with the greatest demand, such as deposit accounts, and reduces the cost of these products. In accordance with these provisions, an agent can be an individual with a business activity or a company that can receive deposits from the public, offer services, and facilitate operations to bank clients in the name and on behalf of a bank. An agent acts as a transactional channel for the bank; however, the commission agent does not constitute a bank branch, nor is its personnel employed by the bank that it represents.

One of the main objectives of establishing the legal concept of a bank commission agent is to create new channels for providing basic financial services to the population at a lower cost for banks and thus help increase banking penetration. Another aim is to foster competition among banks, as through the commission agents they will seek to offer cheaper and better banking services in order to attract additional clients (Box 39).

Agents can carry out transactions such as service payments, cash withdrawals, deposits, loan payments, money transfers, check payments as well as supply the means by which clients can consult their balances and bank movements. Agents are prohibited from making the consumption of a good or service they offer a pre-condition to undertaking such transactions.

In June 2009, amendments approved by Congress to Article 46 Bis 1 of the LIC were issued. These modifications place the following limits on transactions carried out by banks through agents:

I. Daily individual transactions, by transaction type and client, may not exceed the equivalent of 1,500 UDIs in the case of cash withdrawals

and check payments and the equivalent of 4,000 UDIs in the case of cash deposits.

II. Aggregate liabilities transactions (deposit reception and loan acceptance) may not exceed, per commission agent, a monthly amount equivalent to 50 percent of the total amount of the transactions carried out in the period by the bank involved. This limit will be 65 percent during the first 18 months of operations with the agent.

The limits referred to in the two previous paragraphs are not applicable when the commission agent is an entity of the federal, state or municipal public administration, when it concerns the issuance or introduction of any means of payment determined by Banco de México, or when the agents are banks, brokerage houses, or savings and loan entities. Furthermore, the previously referred to provisions establish that banks can authorize agents to contract other parties to carry out transactions and provide banking services on their behalf under the concept of “Agent Administrator”. In all cases, both the agents and the agent administrators (who are also agents) must have a good reputation, be honorable and have the personnel and infrastructure necessary to carry on the banking operations. Corporate groups, companies that offer their trademarks through franchises and their franchise holders, even other banks and savings and loan entities, can also be agents.

Box 39

Potential Expansion of the Banking Network Through Bank Agents

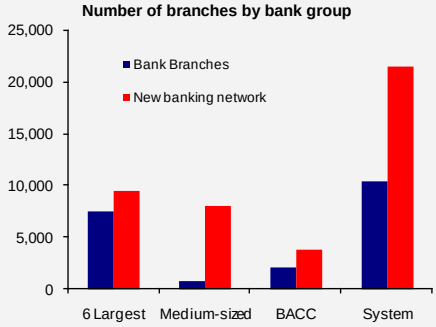
In late 2008, new regulations on Bank Commission Agents were introduced in Mexico. This ordinance will make possible for banks to expand their supply of services to broader segments by using the infrastructure of retail chains. In December 2008, the network of bank branches consisted of 10,354 offices. Of this network, 72 percent belonged to the six largest banks, 20 percent to banks associated with commercial chains (BACC) and 7.8 percent to medium-sized banks. The possible points of distribution of banking services that would be added to the current branch network are those corresponding to retail companies with which banks may establish commission agency contracts. As it is not possible to predict the companies with which banks may establish these contracts, at present, these points correspond to sites at which some banks have already signed contracts with and companies with which they have some kind of joint venture.

One example would be the banks that supply services through Telecom branches. Other banks, in partnership with supermarket chains, have created regulated Sofomes to serve the customers of the joint venture. Others offer banking services through points of sale established in stores either belonging to the same economic group, or the product of joint ventures. In keeping with the security and banking protection regulation established by the CNBV, some BACCs have opened bank branches in commercial facilities of their retail partners. There are still some establishments, however, that belong to affiliated companies or entities with which the banks have signed joint ventures that still do not offer bank services, although they may use their checkout counters to offer them, as the regulation on Bank Commission Agents permits. If we add both the retail units that do not yet offer services and those that currently have commercial partnerships with banks to the total bank network, it would double in size, with the addition of about 10,700 points.

Banks	Bank Branches	Retail units	Total
6 Largest	7,442	2,082	9,501
Medium-sized	816	6,876	8,055
BACC	2,079	1,754	3,870
Total	**10,354**	**10,712**	**21,443**

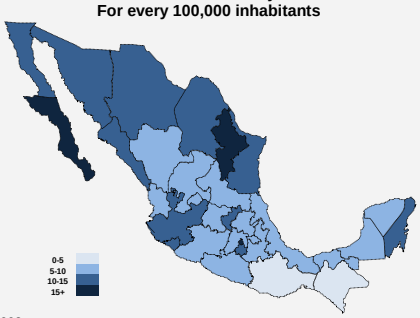
Also included is the total number of retail units that have some equity relationship with a bank, and which may become bank commission agents. Based on these data, the mid-sized banks are those that may see a proportionately greater increase in their points of sale.

Number of branches by bank group



At the close of 2008, the banking network had a coverage of approximately 10 branches for every 100,000 inhabitants. Mexico City and the states of Northern Mexico had the most coverage (see map below). The Southern States were those with the fewest branches per capita.

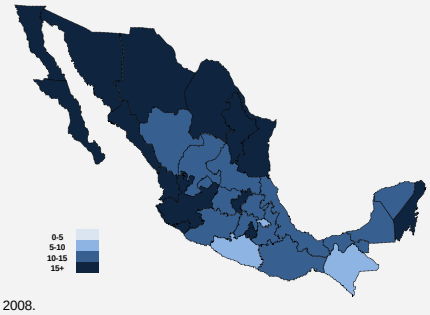
Number of branches by State
For every 100,000 inhabitants



Figures as of 2008.
Source: CNBV and Conapo.

Through the incorporation of the above-mentioned retail units, the coverage of banking services would increase to almost 20 distribution points for every 100,000 inhabitants. This would be equivalent to a 100 percent increase over its current level.

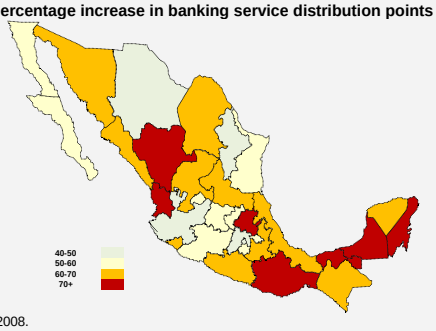
Number of bank branches and potential banking service distribution points 1/
By state
For every 100,000 inhabitants



Figures as of 2008.
Source: CNBV and Conapo.
1. Potential banking service distribution points refers to the sum of current bank branches plus the number of retails stores that may serve as bank commission agents, not including convenience stores.

Based on the information available on the location and distribution of the retail units that could be added to the current banking network, the States where banking penetration is lowest would benefit the most, increasing by between 50 and 70 percent (see map below).

Percentage increase in banking service distribution points



Figures as of 2008.
Source: CNBV and Conapo.

It is important to emphasize that in acting on banks' behalf, agents must comply with the regulations to which banking operations are subject, such as bank secrecy and the prevention of money laundering, etc. At all times banks assume responsibility vis-à-vis their clients for the transactions undertaken through their agents. At the same time, among other things, the agents must: i) accept external audits by the bank involved, the CNBV, or a third party appointed by the latter to carry out the corresponding supervision; ii) accept audits in connection with services related to the commission agency contract; and iii) give information in relation to this point. Should an agent fail to comply with any of its obligations, the bank may take the necessary corrective measures and, when the situation calls for such a course of action, suspend further operations with the agent.

The previously mentioned agency contract is the only regulated means whereby banks can receive the public's deposits through third parties. However, under the provisions of Article 92 of the LIC, a third party can assist bank clients in conducting transactions through a power of attorney ("mandato" in Spanish) or instructions ("comisión" in Spanish). At the present time, some banks, mainly the largest, have signed powers of attorney authorized by the CNBV with different businesses to assist their clients in carrying out diverse banking transactions. For example, through Telégrafos de México (Telecom) or commercial chains[18], banks provide basic banking services. Under this scheme, Telecom acts as the legal representative of the client and for each banking transaction it conducts, provides the client with a receipt in the name of Telecom. Like Telecom, other businesses are mandated to provide money transfer services for final deposit in a bank or cash withdrawal.

The main difference between undertaking banking transactions as a bank agent or by legal mandate is that in the former case, the company always carries out the transactions in the name and on behalf of the bank; in other words, the funds the client entrusts to the commission agent are the responsibility of the bank from the moment the commission agent receives them. On the other hand, under the legal mandate, a relationship is established between the client and the agent, but the latter is not authorized to assume obligations in the name and on behalf of the bank. The agent must therefore inform the client that it does not have Federal Government authorization to assume obligations in the name and on behalf of banks, and that it is not regulated or supervised by the financial authorities.

Regulation of payments through mobile telephones

In June 2009, Banco de México issued regulations for new types of sight deposit accounts known as "Simplified File Accounts (Mobile Accounts)". These accounts are part of a joint effort among different institutions, including the CNBV and Banco de México, to promote access to banking services through cellular phones.

To request the opening of a Mobile Account, a (simplified) file must be compiled that only includes the complete name, date of birth, and address of the client. The opening of the Mobile Account can be done through bank commission agents, which may include mobile telephone carriers, and must adhere to the general CNBV provisions in this regard.

[18] See the section "Banks associated with commercial chains" in the 2007 Financial System Report.

In the course of a calendar month, Mobile Accounts can receive cash or check deposits for up to a maximum of 2,000 UDIs[19] through bank branches, ATMs, commission agents and electronic fund transfers[20]. Such transfers can be made, among other means, through cellular phones, ATMs and computer equipments. Similarly, the client can access the funds in his or her account through cash withdrawals, the use of debit cards and electronic funds transfers.

The regulations establish measures to encourage competition and prevent possible discriminatory practices in fund transfer transactions within the same bank or between different banks. Thus, regulation states that commercial banks must not differentiate between the time it takes to notify beneficiaries of intra-bank transfers and beneficiaries of inter-bank transfers. Finally, commercial banks must ensure that the commissions they charge for undertaking interbank electronic transfers do not exceed those charged for transfers among their own account holders plus the cost generated by the interbank settlement system.

Other modifications

During 2008, modifications to the regulations on dormant bank accounts entered into effect. Funds placed in bank deposit instruments which have no maturity, or whose maturity is automatically renewed, and are subsequently abandoned, must be transferred, with prior notification to the client, to a special global account when no movements have been registered in three years (commissions charged to the account are not considered movements). In this global account, the funds will remain indexed to inflation and the clients' property rights will be preserved, except in the case of amounts below the equivalent of 300 times the daily minimum wage, in which case the accounts will expire in favor of public charities, once three years has elapsed from the time they were deposited in the global account.

[19] Equivalent to 8,500 pesos.

[20] This limit was established based on the prudential rules against money laundering issued by the Ministry of Finance and Public Credit (SHCP), based on Article 14 of the general dispositions referred to in article 115 of the Credit Institutions Law.

Box 40

Payments via Mobile Phones

In recent decades there have been significant advances in information technologies and communications. The pace of research and innovation in the telecommunications industry has encouraged the creation of new goods and services that have in turn had an impact on the payment system. One of these is the use of mobile telephones as a mechanism to carry out payments, a development that could bring substantial benefits to financial service users because it provides easy access for those that are not already financial service users.

Despite the growing popularity of this mechanism worldwide, even for making cross-border payments, there is no universally accepted definition for what is called "mobile payment."

The definition of a mobile payment is complex, because it involves, among other factors, the interconnection of different types of technology like GSM, GPRS, W-LAN or radio frequency (RF) chips, transaction amounts (small or large value), payment forms (programmed, real time or credit), payment environments (remote or proximate) and billing mechanisms (using mobile phone balances or discounting the payment from an account supplied by a financial institution).

One of the definitions most frequently used by experts in the field is that of the European Central Bank (2004)[1], which identifies mobile payments as a sub-group of E-payments associated with bank accounts and executed through wireless communication devices.

Heikkenen (2009)[2] proposes another definition, under which any mobile device, keyboard and screen are considered means of access to payment systems. The author excludes E-banking systems from this definition because in terms of functionality, the mobile telephone accesses the banking service in the same way one would using a desktop or laptop computer.

Beyond the debate over the definition of mobile payments, it is commonly accepted that these payments can be made through mobile telephone connection to a bank account, or when that telephone has information stored on the payment to be made. There are many types of transactions that can be made under the mobile payments scheme, including cash transfers and transfers of credit balances.

The success of this novel payment system depends not only on the advantages it offers but also on demographic and market factors. For example, the lower the penetration of bank services among potential users, the more successful the adoption of mobile payments can be expected to be, because it has to compete with fewer substitute means of payment. In developing countries, therefore, where much of the population does not have access to bank accounts, mobile networks have great potential because they enable customers to make payments in zones where there is no other option.

In Mexico, there are currently a number of projects that use mobile telephone technology to supply banking services. These innovations are aimed at both people with and without bank accounts.

Since 2008, twelve banks and two telephone companies offer a service called "Nipper," which allows the user to link a mobile phone number to a bank account or a credit card to make transactions without the actual bank card. Its scope is still limited. Although the end goal of the service is to make payments in retail establishments using mobile telephones, so far it is only possible to order air time purchases charged to a debit or credit card.

Two banks offer e-banking services through mobile telephones, in which the user can access services similar to those of online banking: balance enquiries, electronic fund transfers between accounts in the same bank or in other banks, either of the same user or other parties, as well as service payments, including bank debit orders and other types.

From a technical standpoint, there are many ways of using E-banking services from a mobile phone. The solutions offered in Mexico are based primarily on:

1. A simplified version of online banking portals (WAP). The user connects directly to the Internet portal of the bank to send instructions or look up balances.

2. A special SIM card installed in the telephone and through which the online banking menu is activated. The user generates instructions from the mobile phone and sends them to the bank through the telecommunications network of the cell phone company.

In Mexico, payments by cell phone have large potential for accessing some banking services, because there are around 76 million cell phones and 61 percent of households have access to this technology. Until only a short while ago, however, there were regulatory obstacles to the massive adoption of cell phones as a means of payment. The financial authorities have been removing these obstacles.

A joint project was recently carried out by various institutions with the support of the Ministry of Finance (SHCP), the supervisory agency (CNBV) and Banco de México to promote access to banking services through mobile telephones. Toward the same end, Banco de México issued new regulations in June on the introduction of a new type of sight deposit bank account called "Simplified File Account (Mobile Accounts)", with few opening requirements, and through which users can make mobile telephone transactions (see Regulation of Payments through Mobile Telephones, in the section entitled Transparency, Competition and Access to Financial Services). It is hoped that when these regulations take effect, people in Mexico that currently do not have access to banking services can join the financial system.

1. European Central Bank, (2004),"E-payments without Frontiers", Document prepared for the European Central Bank Conference, November 10, 2004.
2. Heikkenen, P. (2009), "A framework for evaluating mobile payments", Bank of Finland-Financial Markets and Statistics. March 2009.

8. Payment Systems

This section presents a description of the evolution of payment systems in Mexico as well as recent regulatory changes.[1]

8.1. Large value payment systems

The Payment Systems Law regulates three systems: Banco de México's Account Holder Service System (SIAC), the Electronic Inter-bank Payment System (SPEI), and the Securities Deposit, Administration, and Settlement System (DALI). All of them are considered systemically important[2]. A payment system is considered systemically important when a flaw in it could have large-scale negative repercussions on its participants or give rise to disorder in the financial sector as a whole.[3]

The number of daily transactions in SIAC, SPEI and DALI averaged 175.4 million during 2008, which was 38.2 percent higher if compared to the previous year. Of the total number of transactions, 94.5 percent were conducted through SPEI. In the same year, the average daily amount of transactions that were settled in these systems was about 2.5 trillion pesos, which is 7.6 percent higher than the level registered the previous year (Table 16, Graph 91a and b)[4]. Of this amount, 72.1 percent corresponded to transactions in DALI.

Table 16
Average Daily Volume and Amount of Large Value Payment Systems 2007-2008

System	Billions of pesos				Transactions			
	2007	2008	Annual Change	Share in 2008	2007	2008	Annual Change	Share in 2008
			Percent	Percent			Percent	Percent
SIAC	118	126	6.6	5.0	1,053	1,000	-5.0	0.6
SPEI	540	575	6.3	22.9	117,675	165,841	40.9	94.5
DALI 1/	1,674	1,811	8.2	72.1	8,183	8,576	4.8	4.9
TOTAL	2,333	2,512	7.6	100.0	126,911	175,417	38.2	100.0

1/DALÍ replaced the SIDV in November 2008.
Source: Banco de México.

Electronic Inter-bank Payment System (SPEI)

The largest payment system measured by number of transfers, SPEI, is operated by Banco de México. During 2008, the number of payments settled via this system was 42 percent more than the previous year, and the value of

[1] A payment system is a set of instruments, procedures and systems for transferring funds between banks to ensure money circulation. The payment systems used to settle transactions in financial markets and for obligations generated between the payment systems themselves and financial intermediaries are described as having systemic importance due to the significance they have in the stability of the financial system.

[2] See the 2006 Financial System Report and BIS (2001), "Core Principles of Systemically Important Payment Systems."

[3] BIS (2001), "Core Principles for Systemically Important Payment Systems".

[4] In five days, these systems process transactions greater in value than Mexico's annual GDP.

transactions increased by 6.3 percent in the same period (Graph 91c). Among other things, this can be attributed to the fact that the system enables banks to automate their payment processes and to offer their account holders the possibility of making payments over the Internet. Banco de México has also adopted several measures and supported agreements among banks to overcome the main obstacles that prevented or hindered wider use of SPEI. The following section offers a description of the measures taken and the agreements reached, as well as of the role played by Banco de México in this process.

A central problem was the lack of interconnection standards among participating banks. Even though SPEI formats included information that theoretically enabled a beneficiary of a fund transfer to identify the sender, some issuing banks frequently did not transmit and some receiving banks did not disclose this information, and this practices reduced the value of the service. For this reason, in July 2005, Banco de México issued a regulation requiring issuing banks to identify the sender and receiving banks to disclose this information to the beneficiary.

When SPEI began operating, banks established a 50,000 peso floor on transactions. This was because banks needed time to increase their capacity to process a large number of transactions. Thus, in February 2007, Banco de México issued a regulation to eliminate the minimum transaction amount once banks were ready.

High commissions charged by banks for fund transfers through SPEI also hindered a wider use of this payment system, as they were much higher than those charged on substitute means of payment, especially checks. This was considered inappropriate, given that costs associated with processing checks are, in fact, much higher than for SPEI. This situation generated an erroneous price signal, and so in March 2006, following Banco de México's recommendations, the largest banks decided to put a ceiling of 11 pesos per transaction below 100,000 pesos[5]; other banks followed this practice in May 2007. Although the measure did not fully correct the above-mentioned price distortion, it signaled a step in the right direction.

By the same token, as part of the effort to promote SPEI, Banco de México lowered the commissions it charges banks for the use of this payment system. The commission per transaction was reduced by half, from one peso to 50 cents in April 2006 and, as of February 2008, the system greatly increased its operating hours, and set a charge of only 10 cents per transaction from 19:00 to 8:00.

Another measure to encourage the use of SPEI was to provide access to non bank financial intermediaries. As a result, at the close of December 2008, 74 banks were participating in SPEI, 26 of which are non-banks (Table 17).

[5] This measure does not represent price fixing because each bank decides the level of the commission that it charges, which is below the established limit.

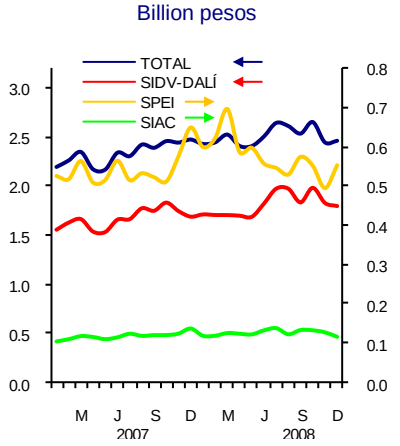
Table 17
Number of SPEI Participants

Type of Institution	Number of Participants		
	Dec 2006	Dec 2007	Dec 2008
Commercial Banks	29	39	42
Development Banks	6	6	6
Brokerage Firms	5	10	15
Insurance Companies	0	1	4
Exchange Houses	3	7	4
Pension Fund Managers (Afores)	0	1	1
Mutual Fund Operators	0	1	1
Limited Purpose Non-Bank Banks (Sofoles)	0	1	1
Total	**43**	**66**	**74**

Figures as at December, 2008.
Source: Banco de México.

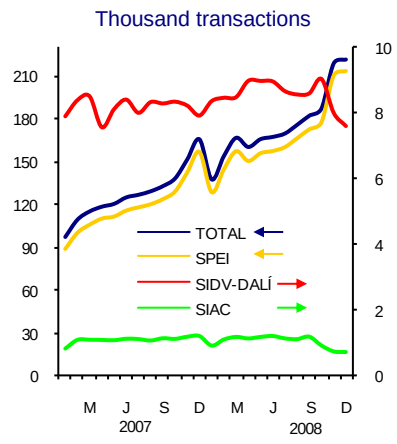
Graph 91
Large Value Payment Systems

a) Transaction value, daily average



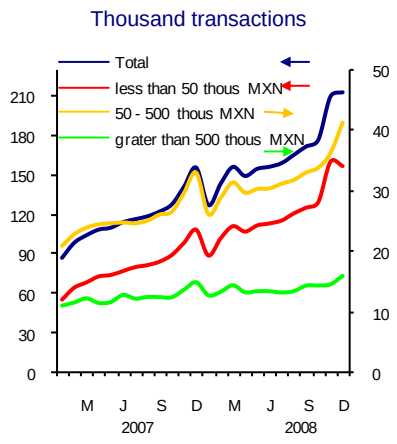
Figures as of December, 2008.
Source: Banco de México.

b) Number of transactions, daily average



Figures as of December, 2008.
Source: Banco de México.

c) Average daily number of SPEI transactions



Figures as of December, 2008.
Source: Banco de México.

At the end of 2006, Banco de México placed a prototype program at the disposition of banks which enables clients to send simple transfer orders by cellular phone. Some banks have already developed products to offer clients payment and electronic banking services in this modality. Finally, in June 2006, Banco de México started offering a service on its web page called “Mi SPEI”, which gives users access to the status of their fund transfer almost in real time.

The rapid adoption of SPEI demonstrates the growing penetration of electronic payment means in Mexico. It should be noted that small value transactions have experienced the greatest growth, implying that its penetration of large value payment transactions is virtually complete, while growth in small value payments should continue. As a result, there has been a significant decrease in the average transaction amount. Furthermore, growth in small value transactions is likely to continue, given that since June 2008, the Mexican Treasury has been

using SPEI to pay suppliers and the payrolls of several of its ministries and agencies.

Securities Deposit, Administration, and Settlement System (DALI)

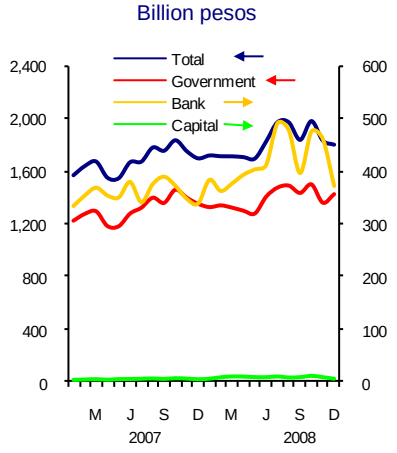
DALI began operations in November 2008, it replaced the Interactive Securities Deposit System (SIDV) (Box 41). S.D. Indeval, Institución para el Depósito de Valores[6] operates DALI. This system settles securities transactions in debt and equity markets. The main participants are banks and broker dealers.

Settlement of transactions via DALI is carried out using the delivery versus payment practice[7]. This settlement practice ensures that a transaction amount will not be charged to a participant's cash account unless the corresponding securities are credited and vice versa. The DALI has a settlement process which every 2 minutes, at the most, determines the transactions with the highest amount that can be cleared and settled with the participants' balances. This system combines the efficiency of a net settlement system and risk management advantages of a real-time gross settlement system. DALI retains the transactions that cannot be settled in a given cycle and tries to settle them in subsequent cycles. It does not settle transactions that generate overdrafts in participants' accounts.

Of the amount settled in DALI, 76 percent corresponds to transactions with government securities, 23 percent to transactions with banking securities, and 1 percent to equity market transactions (Graph 92a and b).

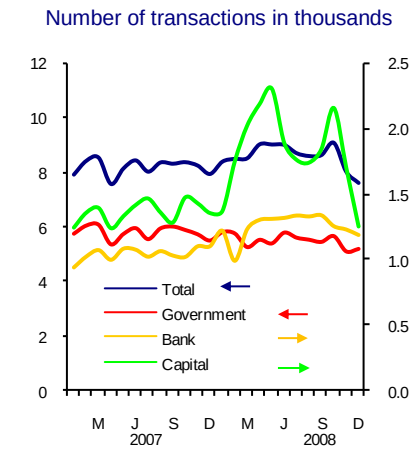
Graph 92
Intraday Securities Settlement System and Liquidity

a) Average daily amount



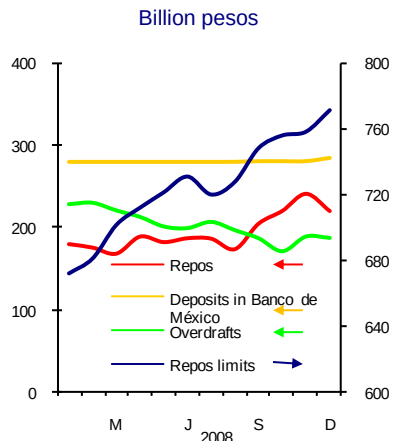
Figures as of December, 2008.
Source: Banco de México.

b) Average daily volume



Figures as of December, 2008.
Source: Banco de México.

c) Use of intraday credit lines extended by the Banco de México



Figures as of December, 2008.
Source: Banco de México.

[6] S.D. Indeval is the legal name of the Mexican central securities depository.

[7] DVP.

8.2. Intraday Liquidity Provision

Banco de México provides intraday liquidity to banks through two mechanisms, so they can settle promptly their transactions in the payment systems. One such mechanism consists of allowing banks to overdraw their current account in the SIAC up to an amount equal to the cash deposits they have in the central bank that are not committed to guaranteeing other loans. The other mechanism involves automatic intraday repo operations[8]. In these operations, Banco de México only accepts securities issued by the Federal Government, the IPAB, and the central bank itself. The funds banks obtain through these repos can be placed in the SIAC or the DALI. Banco de México places a limit on the current repos amount for each bank, this limit depending on the bank's capital.

During 2008, banks obtained intraday liquidity through current account overdrafts averaging 202 billion pesos daily, 72.3 percent of their capacity under this mechanism. Banks also obtained liquidity through intraday repos averaging 193.7 billion pesos daily, 26.7 percent of the maximum amount established by Banco de México under this mechanism (Graph 92c).

Box 41

Replacement of SIDV with DALÍ

In 1978, the first centralized securities depository in Mexico was founded, under the name Instituto de Depósito de Valores. It operated as a government agency until 1987, when it was privatized and legally incorporated as S.D. Indeval, "Institución para el Depósito de Valores, S.A. de C.V." (Indeval). Up until 1996, Indeval's function in settling transactions was limited to transferring the securities involved in transactions by its depositors, and the parties agreed upon the means to be used for settling the payments. In 1997, Indeval began to operate an interactive securities deposit system called Sistema Interactivo para el Depósito de Valores, or SIDV, which introduced the practice of delivery-versus-payment in transaction settlements.

In 2004, Indeval began to develop a new securities settlement system to replace SIDV. Due to the importance of SIDV in the Mexican financial system, Banco de México was an active participant in that project. The main objectives of the new system were: to automate Indeval's operating processes, modernize communication mechanisms between Indeval and its depositors, and improve the security and operating reliability of the system while upgrading its technological platform and architecture. In November 2008, Indeval formally launched the new system for securities deposit, administration and settlement, called "Sistema de Depósito, Administración y Liquidación de Valores", or DALI.

Through DALI, Indeval was able to automate many of the processes it operated manually, simplifying and concentrating in a single component all the various settlement processes used by SIDV. This considerably enhanced its trading and operating reliability. At the same time, the modernization of Indeval's technological infrastructure, together with a more appropriate system architecture for a platform of this type, has improved its performance and made it more scalable.

DALI offers participants two new means of communication for accessing Indeval's services in a more secure and orderly fashion. The first, called the Indeval Financial Protocol, is designed to establish computer-to-computer communications (called host-to-host, or H2H). This protocol is based on an exchange of messages that allow participants to completely automate their processes, reducing the cost and frequency of errors. The second mechanism, called Portal DALI, is an interface that enables depositors to access DALÍ services from their computer's browser. All the instructions that pass through DALI bear a digital signature, which enhances the security of the communications.

DALI settles transactions with greater frequency than SIDV, approximating a real-time settlement system. It also has more efficient communications links with Banco de Mexico's SPEI and SIAC payment systems, making it easier to move funds between these systems.

Comparative table: Features of SIDV and DALÍ

Feature	SIDV	DALI
Settlement cycle frequency	15 minutes	2 minutes (max)
Continuous hours	No	Yes
Use of open communication protocol (ISO-15022)	No	Yes
Operating Risk	High	Low
Use of electronic signatures in transactions	No	Yes
Percent of daily amount settled during first cycle of day, with respect to total daily settlement	< 1 percent	Approx. 20 percent

[8] Automatic intraday repos are due, at the latest, at the close of trading on the day they are made. Brokerage houses can use similar repos, through a bank that previously authorizes them.

8.3. Foreign Exchange Settlement System

On May 26, 2008, the peso was added to the group of currencies that participate in the international currency payment system known as Continuous Linked Settlement (CLS). The CLS is an initiative of the international private sector that responds to a suggestion by the central banks that issue the world's main currencies to eliminate counterparty settlement risk in exchange transactions[9]. The CLS has been operating since 2002 through a special purpose bank located in New York, the CLS Bank, and it uses a payment versus payment mechanism[10]. When it began to operate, the CLS processed transactions among seven foreign currencies; it currently processes transactions among 17 currencies, including the Mexican peso.[11]

Settlement Process

The CLS settles its direct participant's transactions. These participants are large banks (or their subsidiaries) that have stock in the CLS. Direct participants, in turn, provide the service to other banks. Every day, before the beginning of the settlement process, the CLS calculates, for each currency and direct participant, the net balances of the transactions they have presented. A participant with a short positions in a currency (that sells more than it buys) must deliver the amount of the position to CLS between 7:00 AM and 12:00 PM, European central time. A participant with a long position (that buys more than it sells) will receive from CLS the amount of the position in the same timeframe. Although direct participants assume obligations in each of the transactions they process with CLS, they need deliver only to CLS the amount of the net short position in each currency.

Direct participants use local banks as correspondent banks in countries where they do not have access to the payment system. In these countries, the correspondent banks send and receive CLS payments in the name of the direct participant. The average daily amount traded in the CLS exceeds three trillion dollars; however, the relationship between the net settled amount and the gross traded amount is only 5 percent for the system; for the Mexican peso it is 10 percent (Graph 93).

Settlement in Pesos

In the case of Mexico, the net results in pesos that the CLS calculates are settled in SPEI (in the evening). As in all countries whose currency participates in the system, CLS has an account in Banco de México and access to the local payment system.

Banks that operate in Mexico can settle their transactions (and those of their clients) in CLS in different ways: i) through their home offices, in the case of

[9] Settlement risk refers to the possibility of a counterparty delivering the amount in the agreed-upon currency and not receiving the corresponding amount, in which case, the total value of the asset is at risk. The settlement risk is increased by the difference in time zones of the currencies' countries of issue.

[10] Under this mechanism, in any transaction, one of the parties will provide the amount in the agreed upon currency if, and only if, its counterparty delivers the amount in the other currency.

[11] The foreign currencies that are traded are the Australian dollar, the Canadian dollar, the New Zealand dollar, the U.S. dollar, the Singapore dollar, the Hong Kong dollar, the yen, the euro, the Swiss franc, the Danish crown, the Norwegian crown, the Swedish crown, the pound sterling, the South African rand, the Korean won, the Israeli shekel, and the Mexican peso.

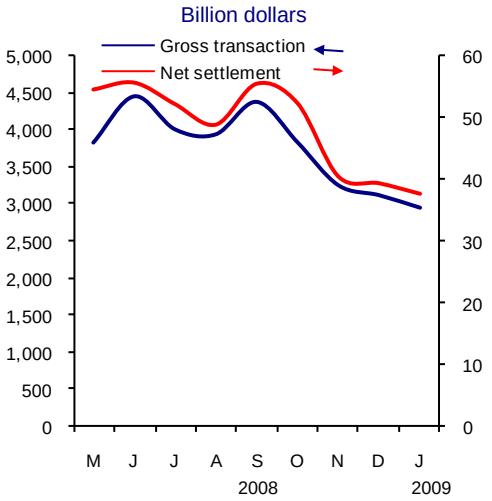
subsidiaries of direct participants; ii) by becoming shareholders and direct participants; and iii) by using the services of a direct participant or a subsidiary. No Mexican bank acts as a direct participant in the CLS; however, four banks act as correspondent banks of direct participants that trade in pesos in CLS.

Market Share

According to The Bank for International Settlements (BIS), 55 percent of the world's foreign exchange markets settle transactions in the CLS[12]. In the case of peso transactions, both Mexican and foreign banks have gradually transferred their operations to the CLS, but their market share is still below the above-mentioned percentage. The international financial situation of recent months has reduced settlement amounts, both for the peso and other currencies (Graph 93b).

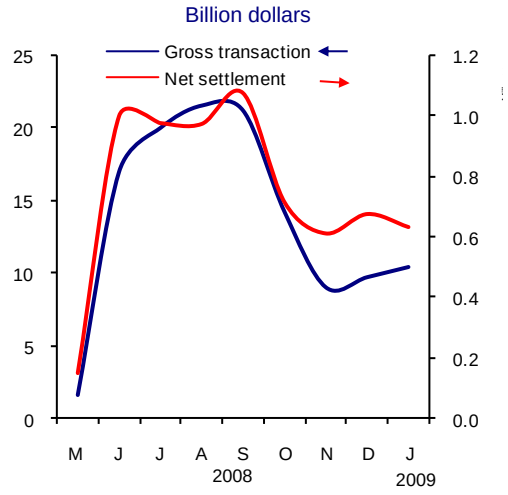
Graph 93
Settlement of Foreign Exchange Transactions in the CLS

a) Average daily settlement of all currencies in CLS



Figures as of January, 2009.
Source: CLS.

b) Average daily settlement of the peso in CLS



Figures as of January, 2009.
Source: CLS.

8.4. Retail payment systems

Retail payments are used to settle obligations arising from the purchase of goods or services between individuals or between individuals and companies. There are retail payment systems that are paper-based (cash and checks) and those that are electronic, such as credit and debit cards, and electronic fund transfers. Even though electronic transactions have been rapidly expanding, cash continues to be the most used mean of payment in Mexico.

Credit and debit cards

The number of debit cards increased from 51.9 million in December 2007 to 56.9 million at the end of 2008, representing a 9.6 percent increase.

12 BIS, "*Progress in reducing foreign exchange settlement risk*" (2007), Committee on Payments and Settlement Systems.

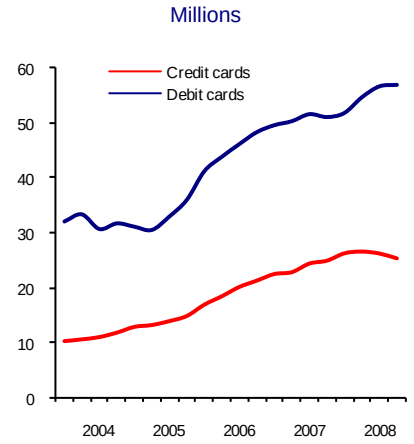
However, during the fourth quarter of 2008 the number of debit cards had an annual growth rate of only 0.5 percent. Meanwhile, the number of credit cards grew by 2 percent during 2008. Nevertheless, as of the third quarter of that year, a decline was observed in the number of credit cards issued, a trend which intensified during the final few months of the year, reflecting a more cautious stance among banks to granting credit cards (Graph 94a).

The network of point of sale terminals (POS) installed in Mexico increased from 418,000 in December 2007 to 446,000 in December 2008, an icrease much lower than 2008's 37%. The reduction in the growth rate and installation of POS terminals could be due to the completion of the POS terminalization program known as FIMPE[13], which provided incentives to banks to install terminals, and to lower economic growth (Graph 94b).

The number of credit card transactions had a 7.5 percent growth in 2008 year-on-year. Nevertheless, during the last quarter of 2008, such transactions declined 1.7 percent year-on-year (Graph 94c). Likewise, the real value of the transactions increased by 4 percent between 2007 and 2008, but the last quarter showed a 3.5 percent year-on-year decrease.

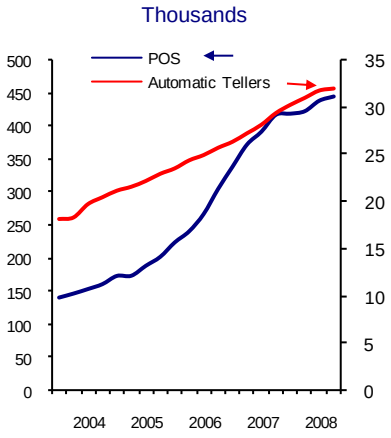
Graph 94
Credit and Debit Cards

a) Number of credit and debit cards issued



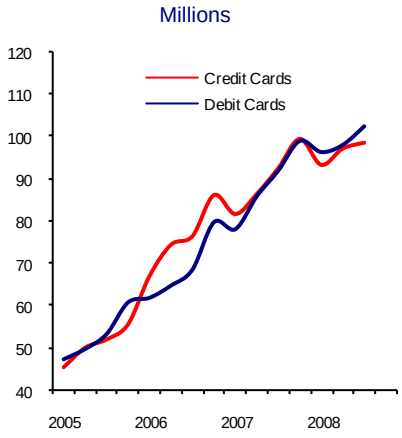
Figures as of December, 2008.
Source: Banco de México.

b) Number of ATMs and POS Terminals



Figures as of December, 2008.
Source: Banco de México.

c) Number of card transactions at POS terminals



Figures as of December, 2008.
Source: Banco de México.

The number of debit card transactions grew almost 17 percent in 2008 year-on-year, and had a real increase of 11 percent in their value. In addition, the number and real amount of transactions using debit cards during the last quarter of 2008 increased 18 percent and 13 percent, year-on-year, respectively. This favorable performance can be attributed to the increase in the number of debit cards in 2008. Indeed, as of the first quarter of 2008, debit card transactions

[13] The Electronic Means of Payment Infrastructure Fund (FIMPE)aims to promote and increase access to the electronic means of payment network as well as to encourage the use of such means of payment among businesses and consumers alike. The FIMPE was created in 2005.

accounted for more than half the total number of transactions carried out at POS terminals.

The average POS transaction amount decreased in real terms for both credit and debit cards[14] due to two complementary factors: firstly, banking penetration has reached lower-income earners, who tend to carry out transactions involving smaller average amounts; and secondly, the gradual entry of businesses with lower average sales levels to the POS terminal market.

Automatic Teller Machines (ATMs)

Despite the growing penetration of electronic means of payment in Mexico, a large part of the transactions, especially those of very small value, continue to be conducted with cash. ATMs have reduced the cost that banks face in providing clients with cash because the cost of offering this service through their branches is much greater. Furthermore, the automated teller machines network is much more extended than that of bank branches. From the card holder's point of view, part of the benefit of the ATMs resides in the network being interconnected[15]. As a result, a card holder can carry out transactions using the ATMs of any bank. This characteristic adds value to the service, especially in the case of banks which do not have an extensive network of ATMs.

In Mexico the ATM network has grown 39 percent in the past three years to 31,932 teller machines as at December 2008. Growth in out-of-branch ATMs has surged 50 percent during the same period, while growth in in-branch ATMs has been 23 percent (Graph 95a).

Banks' ATM networks have developed unevenly. The six largest banks have experienced below average growth rates and therefore their market share has diminished, hence its slip from 89 percent in 2007 to 85 percent in 2008. In contrast, the opening of ATMs by smaller banks exhibited higher rates of growth, especially in the case of ATMs installed in areas other than bank branches. Thus, for example, the ATM network of three small banks increased at an average annual rate of 116 percent in the last three years. These banks currently account for around 11 percent of all ATMs. As a result, the Herfindahl Hirschman Index for the ATM business has diminished, so the indexes for ATM concentration are now more favorable than those of debit cards, both in terms of levels as well as dynamism (Table 18).

In spite of the increase in the number of installed ATMs, compared with a sample of countries (Graph 96b and c), the Mexican market shows the highest number of debit cards per ATM and the lowest number of ATMs per million inhabitants. The following section will explain the commission structure for the use of ATMs.

At present, card holders do not usually pay any commission when they carry out transactions at their own bank's ATMs. However, when the transaction is

[14] The actual value of credit transactions declined from 652 pesos at the end of 2006 to 607 pesos two years later. During the same above-mentioned period, the real average value of the debit card transactions fell from 448 to 393 pesos.

[15] "Interbank ATM transactions" are transactions conducted by a card holder at the ATM of a bank different to the one which issued the debit card.

carried out at an ATM of another bank, different payments –involving the card holder, the owner of the ATM, and the bank issuing the debit card– are generated.

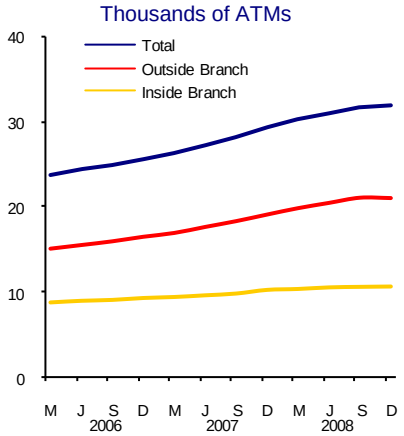
Table 18
Concentration of Debit Cards and ATMs

Market Share (percentage)	Debt Cards		ATMs	
	2006	2008	2006	2008
Two largest banks	41.8	48.1	43.5	36.9
Four largest banks	75.2	74.5	75.7	68.2
Seven largest banks	98.6	94.7	94.6	85.4
Herfindahl Hirschman Index[1/]	**1694.2**	**1675.3**	**1661.0**	**1423.4**

Figures as of December, 2008.
Source: Banco de México.
1/ The Herfindahl Hirschman Index is defined as the sum of the market share of each bank squared.

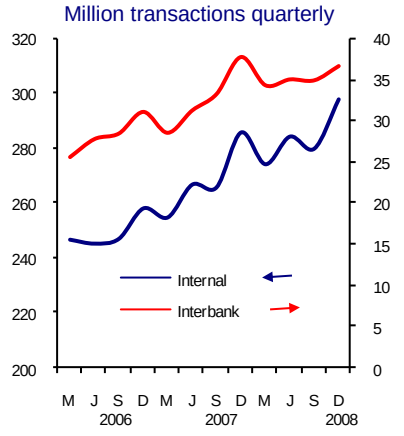
Graph 95
Evolution of ATMs

a) Number of ATMs installed



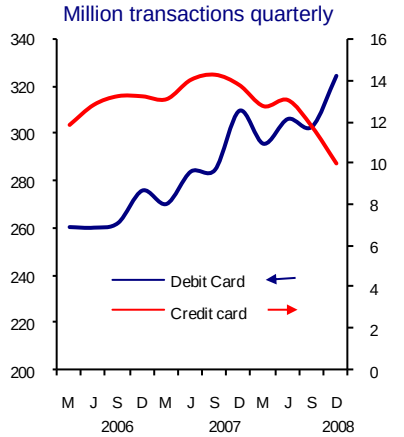
Figures as at December, 2008.
Source: Banco de México.

b) Operating volume of ATMs



Figures as at December, 2008.
Source: Banco de México.

c) Operating volume in ATMs



Figures as at December, 2008.
Source: Banco de México.

When a card holder uses the ATM of a bank other than the one that issued the debit card (interbank ATM transaction), the issuing bank must compensate the owner of the ATM for the use of the infrastructure. This commission is known as the Interbank Fee. In Mexico, all banks pay the same interbank fees to owners or operators of ATMs (7.25 pesos for cash withdrawals and 3 pesos for consulting bank balances) independently of where the ATM is located.

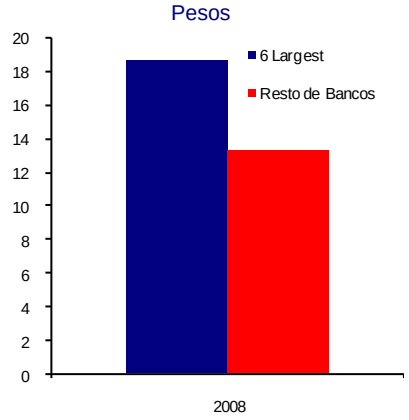
There is another commission that the ATM's owner can directly charge to the card holder, known as a "surcharge". This commission is determined by the owner of the ATM and it can vary depending on the ATM's location. Currently, only six banks apply surcharge fees. Thus, ATM owners' income comes from the interbank fee and the surcharge. As stated, the interbank fee –unlike the surcharge fee, which is determined by the ATM's owner- is the same for all and is paid by an issuing bank when its clients use another bank's ATM.

Issuing banks usually transfer to their clients the interbank fee that must be paid to the ATM owner with a high mark up, and call this charge the Commission for the Use of Another Bank's ATM (CUCA).[16]

The CUCA is determined by each issuing bank based on its business strategies and how many of their own ATMs they have. Some banks that do not have an extensive network of their own ATMs generally charge a lower CUCA, as their clients are obliged to use ATMs of other banks. Some banks even set the CUCA below the interbank fee, thus subsidizing their clients' use of other bank's ATMs. Graph 96a shows the largest banks' CUCA to be higher than that of other banks. Largest banks have more extensive ATM networks and can therefore "penalize" their clients for using another bank's ATM. Financial authorities in several countries are currently reviewing ATM commissions (Box 42).

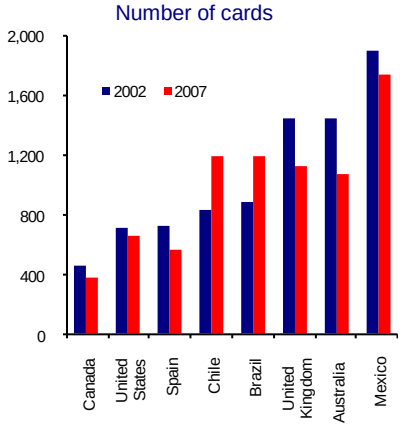
Graph 96
Automatic Teller Machines

a) Average commission for use of another bank's ATM



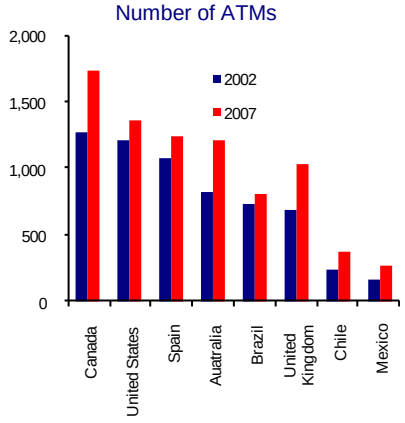
Figures as at December, 2008.
Source: Banco de México.

b) Debit Cards per ATM: International Comparison



Figures as at December, 2008.
Source: Banco de México.

c) ATMs per million inhabitants: International Comparison



Figures as at December, 2008.
Source: Banco de México.

[16] This commission is also known in the industry as a foreign fee

Box 42

International Experience in ATM Regulation

In some countries, distortions have been detected in the ATM market leading the local authorities to issue regulation on the matter. The following paragraphs discuss the experience of Australia, the United Kingdom and the United States.

Australia[1]
The system of automatic teller machines in Australia consists of a series of interconnected networks based on bilateral agreements that include the payment of interchange fees (IF) by card issuers to ATM owners (acquirers). Many institutions charge a fee (called foreign fee) when a cardholder uses his or her card in an ATM owned by another bank. These fees are often significantly higher than the regular IF. Australian authorities considered this system as having the following disadvantages:

1. No competitive pressure on the IF. The IF had been fixed for many years because bilateral agreements were difficult to renegotiate and consumers had no influence on them. Also, IF bore no relationship to the cost of providing the service.

2. IF made it more difficult for new competitors to enter. The prevailing organization at that time obliged new participants to sign bilateral agreements with all the institutions, but these in turn had little incentives to allow new competitors.

In order to eliminate these distortions, the Reserve Bank of Australia introduced an ATM access regime. The new system has:

a) Eliminated the payment of IF between direct participants in the ATM system.
b) Capped the price that a competitor must pay for direct connection with another participant.

The reforms took effect on March 3, 2009.

United Kingdom[2]
Before the year 2000, the IF scheme in the United Kingdom allowed for the application of volume discounts for issuers, and premiums for large acquirers. This pricing structure tended to favor large banks and those members who only acquired or only issued. A new structure of interbank fees agreed in 2000 involves a flat IF that can be adjusted depending on the type of transaction and the place where it is carried out.

Each IF is determined by the switch (LINK) based on an annual costs study. The LINK rules allow both the issuer and the acquirer to charge for cash withdrawals (foreign fees and surcharges, respectively).

However, if the acquirer imposes a surcharge on interbank transactions, it cannot also collect the IF, and vice versa. The rules also forbid both the issuer and the acquirer from charging a fee on the same transaction, and prohibit discriminatory charges.

United States[3]
Around the mid-1980s, some banking institutions began to appeal to antimonopoly legislation to question the ATM networks' ban on ATM owners charging users directly.

The banks argued that in order to expand the ATM network to remote sites or small towns without bank branches (convenient locations for clients, but expensive to operate) they needed the revenues generated by fees that could be charged directly to users (surcharges).

Cirrus and Plus, two nationwide networks, lifted their bans on this practice on April 1, 1996. As a result, in the three subsequent years, both the number of banks that collected fees from clients of other institutions who used their ATMs and the amount of the fee charged rose significantly.

This measure had a clear impact on bank infrastructure. In 1994, there were 29,000 out-of-branch ATMs, accounting for 26.3 percent of the ATMs existing in the country. By 1997, this number had risen to 67,000, or 40.6 percent of the total. Two years later the number had grown to 117,000.

Thus, the ability to surcharge enabled banks to cover the costs of expanding their network and subsidized the costs associated with the transactions performed through it.

Despite the expansion of the ATM infrastructure, since surcharges were first allowed on ATM withdrawals, there have been objections from consumer groups claiming that they were being charged twice for the same service.

In conclusion, the experience of these three countries does not point to any standard system for regulating ATM usage fees.

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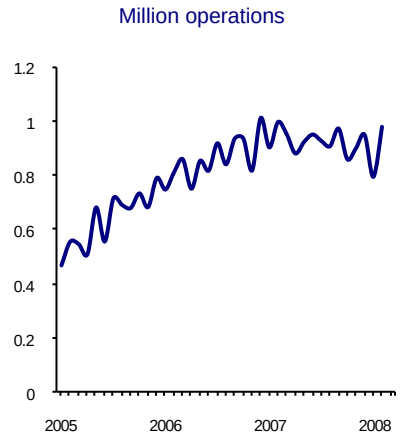
1. Reserve Bank of Australia (2009), “An Access Regime for the ATM System”.
2. Office of Fair Trading (2003). “U.K. Payment Systems: An OFT Market Study of Clearing Systems and Review of Plastic Card Networks,” London, OFT658.
3. Pidgeon, A. (2000), “Show me the Money but don’t Make me Pay for it: an Analysis of Why Legislation banning ATM Surcharges is Inappropriate and Unwarranted”, Legislation and Public Policy, Vol 3:393.

Checks and Low Value Electronic Transfers

Banco de México has encouraged the use of electronic fund transfers in both real time (SPEI) and for settlement the following day (EFT).[17] [18] The central bank has also promoted the use of direct debit payment and interbank transfers for the payment of credit card balances. The use of EFT and direct debit payments in Mexico has increased over time. Thus, between 2007 and 2008, the number and real value of the EFTs increased 17 and 21 percent, respectively. The number and real value of successful interbank direct debit payments rose by 23 and 22 percent, respectively over the same period. Meanwhile, during the past year, the number and value of the transactions made using interbank checks decreased 7 and 9 percent, respectively. Likewise, the number of interbank transfers to pay credit card balances (Graph 97a) has reached one million per month to date. The growing number of Internet banking users, up 18 percent in 2008 to nine million, has contributed to this trend.

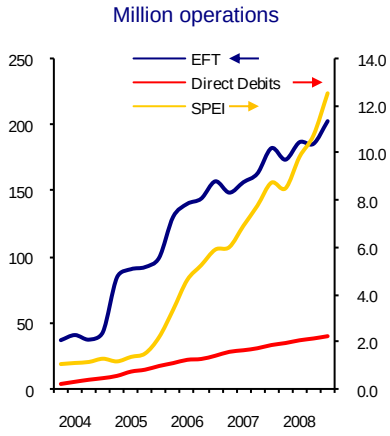
Graph 97
Use of Different Means of Payment

a) Interbank transfers for paying off bank credits



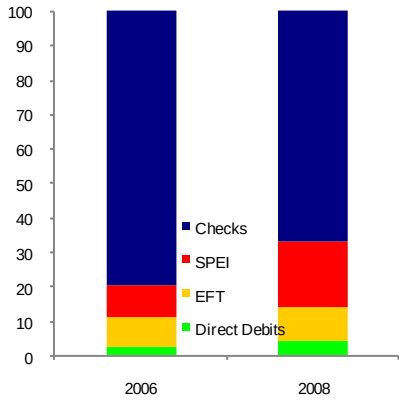
Figures as at March, 2009.
Source: Banco de México.

b) Operating volume



Figures as at March, 2009.
Source: Banco de México.

c) Number of interbank transactions



Figures as at March, 2009.
Source: Banco de México.

9. If we consider interbank payments among which there is a certain degree of substitution (i.e. SPEI, EFT, direct debit payments, and checks) and the sum of these payments as the total universe of transactions, we find that the percentage of payments made using checks has dropped from 79.7 percent of the total in 2006 to 67.2 percent in 2008. In contrast, the percentage corresponding to the SPEI has more than doubled, from 9.3 percent to 18.9 percent, during the same time period. In addition, EFT transactions have increased from 8.6 percent of the

[17] The distinction between large and low value payments has been eliminated, as there is no restriction on the amount of money that can be transferred in the case of either the SPEI or EFT.

[18] Contrary to payments made through the SPEI, electronic fund transfers (EFT) take between one and two days to be credited to the beneficiary's account (see Box 43 of the 2007 Financial System Report).

total in 2006 to 10.1 percent in 2008, while direct debit payments have risen from 2.4 to 3.8 percent (Graph 97c).

10. Conclusions

The international financial system is immersed in the most severe and extensive crisis since the Second World War. The worsening of the crisis, especially as of September 2008, has had major adverse effects on emerging economies, the Mexican economy included. Given the specific characteristics of the local economy, some of these shocks have turned out to be particularly stressful. In addition, some concurrent phenomena unrelated to the financial crisis, including the impact of government measures following the outbreak of Influenza A(H1N1), have contributed to a slump in consumption and private investment.

Mexican banks and financial institutions have proven resilient to a hostile environment. An efficient and modern payment system, deep financial markets, along with profitable and well-capitalized financial intermediaries, have enabled Mexican banks to confront the crisis from a position of strength. Banks in Mexico are well-capitalized and have adequate provisions, which in turn have enabled them to maintain an adequate flow of financing to domestic firms, in some cases compensating for tighter access to foreign financial markets.

The derivative-related losses incurred by some Mexican companies have added to the overall climate of uncertainty by raising a series of questions regarding: risk management and corporate governance policies, disclosure of financial products, the incentives structure of financial intermediaries, the quality of information issuers provide public investors with, the performance of rating agencies, and the oversight and legal documentation of derivative transactions.

The current crisis has resulted in substantial losses at several financial institutions that are the parent companies of some Mexican banks. This situation does not, however, pose a threat to the solvency of the country's financial institutions or the stability of the Mexican financial system as a whole. Banks in Mexico have a separate legal status from their parent companies. In addition, Mexican regulationsplaces strict limits on transactions between banks and their parent companies abroad. However, actions taken by banks and international financial groups that have been de-capitalized in the current crisis could have diverse ramifications for the markets in which they participate. Specifically, de-leveraging has impacted credit and liquidity in foreign exchange, debt, and derivatives markets.

Mortgage loans have decreased in real terms. On the one hand, conditions for accessing such financing have become stricter, while on the other, demand for credit has been eroded by a major reduction in the payroll and drop in consumer confidence. The credit card portfolio continued to deteriorate during 2008 and the first half of 2009. Delinquency levels rose among both new borrowers and mature ones. Also, both groups used more credit, a situation that could reflect a more vulnerable financial situation among debtors in general. However, based on available information, it is not possible to conclude that there is widespread over-indebtedness among borrowers in Mexico. Banks have reacted to the fall in consumer credit by implementing diverse programs to restructure payments in arrears and by using more stringent criteria when issuing new loans. As a result, credit risk indicators for mortgage loans have remained at low levels. Strong growth in mortgage loans in recent years, however, is

generating some concern about the level of household debt. In Mexico there is a lack of information in this regard. In order to be able to better assess the trend in households' financial situation, the information must be broadened to include households in different income brackets.

The trend in financing to non-financial private firms in 2008 and the first half of 2009 was affected by conditions prevailing in international financial markets and their effect on local debt and bank credit markets. Companies resident in Mexico faced major restrictions on tapping international credit markets as well as higher costs. Conditions in Mexico's debt markets began to deteriorate at the end of September 2008, liquidity diminished, financing costs increased, and debt placement maturities became shorter. Meanwhile, growth in bank credit to firms slowed. In addition, there was a notable increase in the concentration of financing to bigger firms by the largest as well as some medium-sized banks. This trend in granting more credit to an increasingly smaller number of borrowers has intensified in recent months and can be attributed to tougher credit conditions abroad. Greater loan concentration increases banks' vulnerability to a deterioration in economic conditions. This is because when a loan portfolio is concentrated, the potential losses for banks in the event of defaults are relatively higher. The results of credit and market risk stress scenarios point to a decrease in the capitalization levels of some banks in the event of such circumstances materializing. However, in none of the scenarios analyzed does the resulting capitalization index fall below the regulatory minimum.

The current crisis has brought to the fore the importance of liquidity conditions in interbank markets. The contagion simulation exercises conducted in this Report reveal that the percentage of assets managed by banks whose capitalization index falls below the regulatory minimum is not significant relative to the system as a whole. This means that the interbank market has acted as a buffer against external and internal financial turmoil and has thus contributed to mitigating its negative repercussions on the local financial system. In addition, the results suggest that the risk of contagion did not significantly increase in the course of the current crisis. Nevertheless, relatively more vulnerable banks in terms of funding sources should make efforts to diversify them and be prepared to implement timely corrective measures to prevent their liquidity and solvency situation to weaken. On average, the liquid assets to short-term liabilities ratio for the group of largest banks has remained at reasonable levels. However, the number of banks showing a slight deterioration in liquidity has grown, particularly among the medium-sized banks.

The current outlook holds major challenges for the Mexican financial system. Higher consumer credit delinquency levels and the likely deterioration in business and mortgage loan portfolios due to a slower rate of economic growth and job losses constitute big hurdles. Thus, like other emerging economies, the Mexican economy faces an extremely weak international environment in which it will be some years before macroeconomic imbalances are corrected.

Finally, maintaining the stability of the financial system requires the ongoing assessment and review of financial market and institutions regulation and supervision, as well as the scope and attributions of financial authorities. However, the challenge in Mexico is how to increase financing to the private sector and long-term investment projects to levels similar to those of countries with a comparable level of development, in a healthy and sustainable way.

The international crisis has exposed deficiencies in the regulation and supervision of the international financial system, particularly in advanced economies. In addition, the speed and degree of severity with which the contagion spread to other economies caught financial authorities off-guard. Therefore, as of November 2008, a review of the regulations and mechanisms of international coordination and cooperation got underway with the aim of being better prepared to confront financial crises and mitigate contagion. With this in mind, international financial committees and institutions have expanded their membership to include representatives of the most important emerging economies, including Mexico.

Among the main conclusions reached, under the leadership of the G20, is the need for financial authorities to formally adopt the goal of maintaining the stability of the financial system and to incorporate in their legal frameworks attributions that would enable them to more effectively carry out this effort. In addition, regulation and supervision should focus on addressing problems of a systemic nature and identifying financial institutions and markets whose instability could have serious effects on the rest of the system and on the economy as a whole. At the same time, under the aegis of the G20, a process of cooperation has begun among financial authorities to improve the oversight of large international banks and multiple and complex legal and financial relationships they maintain with institutions established in other countries, many of which have a presence in Mexico through subsidiaries.