BANCO DE MÉXICO

Financial System Report

October 2014

BOARD OF GOVERNORS

Governor

AGUSTÍN GUILLERMO CARSTENS CARSTENS

Deputy Governors

ROBERTO DEL CUETO LEGASPI

JAVIER EDUARDO GUZMÁN CALAFELL

MANUEL RAMOS FRANCIA

MANUEL SÁNCHEZ GONZÁLEZ

NOTICE

Unless otherwise specified, this document has been drafted using information as of October 20, 2014. Figures are preliminary and may be revised.

USE OF INITIALS AND ACRONYMS

In this report, initials and acronyms that correspond to names in English appear in italics, whereas those that correspond to names in Spanish appear in regular Roman characters.

TABLE OF CONTENTS

1. Introduction

In this *Financial System Report*, Banco de México analyzes risks that, from the central bank's standpoint, could become threats to the stability of the Mexican financial system. Therefore, rather than describing relevant events occurred during the period covered –November 2013 through October 2014−, the document focuses on the *status quo* of major financial risks to financial stability as of October 2014.

During the first quarter of 2013 and the first half of 2014, financial markets saw a decline in volatility indices and risk premia, matched by a moderate recovery in capital flows towards emerging economies. Yet, risks associated to the normalization of monetary policies in developed economies, particularly in the US and the UK, have heightened thereafter. On top of this, there have been concerns over the growing weakness of the European economy and the sustainability of the world economic recovery. All these factors significantly increased volatility in October and are having a far from negligible effect on investors, who proceed with growing caution.

In this situation, emerging economies face risks derived from both the extended period of extremely expansionary monetary policies in developed countries and the potential disorderly normalization thereof. In addition, lower liquidity levels in some financial markets, namely the debt market, and the higher amount of resources channeled through entities and transactions not subject to traditional banking regulation exacerbate vulnerabilities. Both events stem from the implementation of more strict regulation, among other reasons, and pose an overriding challenge to financial authorities.

As for the general economic situation, although global activity is picking up steam after a timid beginning this year, uncertainty prevails. In the US, economic growth picked up pace during the second quarter, after a temporary fall-off during the first quarter, whereas in the UK growth exhibited a high level during both periods. Nevertheless, doubts regarding the sustainability of the recovery are not fully dispelled yet. The European economic situation continues to be vulnerable and the Japanese recovery more moderate than originally expected. Furthermore, growth in major emerging economies has slowed down on the back of the less buoyant Chinese and Brazilian economies, less favorable financial conditions and the implementation of stabilization programs in certain countries.

In perspective, several factors account for a barely optimistic risk balance; namely, poor global economic growth, risks associated with the normalization of monetary policies in advanced economies –specifically in the US and the UK, as mentioned before−, the decline in commodity prices, increased geopolitical risks stemming from the Ukraine crisis and the Middle East situation, and concerns over the Ebola epidemic.

In Mexico, economic activity improved during the second quarter of 2014, in contrast with the two previous quarters. The latest data suggest that economic activity continued to be vibrant during the third quarter, albeit with ups and downs. This, together with prospects for a recovery of the US industrial sector, points at the strengthening of domestic economic activity for the remainder of the year. This situation is expected to refuel bank credit, which will in turn contribute to reboosting domestic demand.

Financing received by the public and private sectors continued to grow in 2014 –the increase in foreign financing is noteworthy. Funds granted by the Mexican financial system to companies and households also continued to grow, albeit at lower growth rates than in past years. The slowdown in commercial bank loans can be explained by both the lower economic activity of 2013 and the first quarter of 2014, and by large companies replacing bank loans for foreign funds. On the other hand, payroll and personal loans have also thrived. This boom could be partly explained by banks' efforts to promote business lines offering higher expected yields, in contemplation of widening the narrow financial margin resulting from lower interest rates.

As stated before, this *Report* analyzes major risks faced by the Mexican financial system, emphasizing those associated with a possible dramatic reversal of capital flows. This reversal could be triggered by the disorderly normalization of monetary policies in developed countries, as well as by the worsening of imbalances derived from the excessive prolongation of the monetary stimulus. Also, the sharpening of geopolitical risks and poor global economic recovery pose potential risks to financial stability.

Nevertheless, despite the complex international financial environment, resulting from a weak and highly heterogeneous economic recovery and the persistence of lax monetary policies and significant fiscal imbalances, Mexico continues to distinguish from other emerging economies, thanks to prudent fiscal and monetary policies, a sound and well capitalized financial system, and the scope and depth of the already approved structural reform. All these positive aspects have translated into the better relative performance of domestic financial markets and prospects for economic growth in the medium term. This report concludes underscoring that Mexico must reinforce measures to strengthen the financial system, and preserve the macroeconomic soundness which differentiates the Mexican economy. In like manner, it must be ensured that reforms be adequately implemented.

This document contains six sections, including an introduction. The second section presents an assessment of financial stability, making emphasis on the macro-financial environment, as well as on credit, market, liquidity and contagion risks. The third section analyses the evolution of commercial banks, the chief financial intermediaries in Mexico. Yet the section also focuses on development banks and trusts, and particularly, on financial transactions and entities not subject to traditional banking regulation. The fourth section presents the performance of domestic financial markets and the infrastructure of the financial system. The fifth section presents results of stress tests and discusses their implications. The *Report* closes with a balance of risks and some conclusions.

2. Assessment of Financial Stability

Financial stability should be understood as a situation in which the financial system is sufficiently flexible to withstand shocks of varying nature and intensity, so that when said events materialize, no substantial changes or disruptions in intermediation services take place. The timely identification of sources of financial instability requires the ongoing follow-up of both the macro-financial and economic environments, and the event that may trigger significant disruptions or changes in the financial system.

2.1 Economic Environment

The global economic environment has been marked by an increasing growth gap among advanced economies, and between these and emerging countries. In consequence, the divergence of expected paths for monetary policy has intensified. Indeed, as the US and UK economies show strong signs of recovery, they are expected to lead the change in monetary stance. In contrast, the economic backdrop in the Eurozone continues to erode and Japan's expansion has been more modest than expected (graph 1c). For their part, the major emerging economies experience a deceleration attributable to a handful of factors: the protracted period of growth below potential in developed nations, the Chinese economic slowdown, less favorable financial conditions, the implementation of stabilization programs and geopolitical tensions.

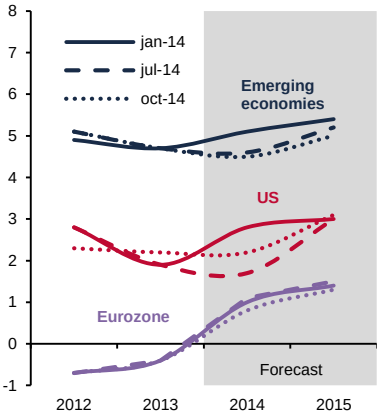
In addition to this vastly heterogeneous global economic outlook, there are doubts over the strength of the global economic recovery. Prospects for global growth have been revised downwards between January and October 2014, coming from 3.7 down to 3.3 percent for 2014 and from 3.9 to 3.8 percent for 2015.[1] Both advanced and emerging economies will contribute to the fulfillment of these forecasts, in a context where ultra-accommodative monetary policies will be gradually removed. After a temporary contraction during the first quarter of 2014, US economic activity spiked in the subsequent quarter, driven by higher levels of consumption and non-residential investment −this resulted in a GDP upward revision for the current and the following year (graph 1a). It should be noted that the reinvigorated US economy has kept the unemployment rate falling while inflation remains below the targeted 2.0 percent.

[1] See IMF, World Economic Outlook, January and October 2014.

Graph 1
Growth Prospects and Reference Rates

a) Gross Domestic Product

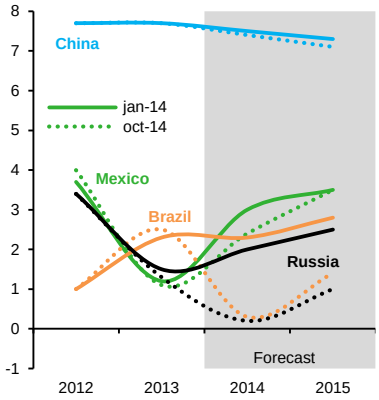
Real percent change



Figures as of October 2014
Source: IMF, *World Economic Outlook*

b) Gross Domestic Product[1/]

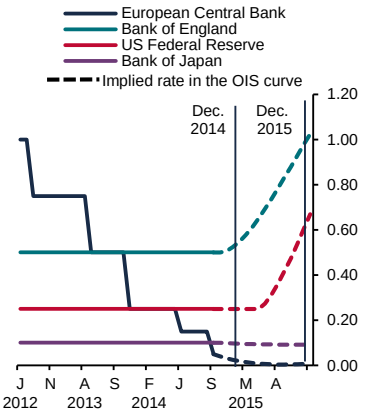
Real percent change



Figures as of October 2014
Fuente: IMF, *World Economic Outlook*

c) Reference rates[2/]

Real percent change



Figures as of October 2014
Fuente: Bloomberg and own calculations

1/ For China and Mexico, estimates for January, April, July and October are virtually equal to each other.
2/ Dotted lines correspond to rates implied in the overnight indexed swap curve, where the fixed rate is the one-day effective reference rate.

In contrast, in 2014, economic recovery in the Eurozone lost momentum: following a period of modest growth during the first quarter of the year, the region experienced zero growth in the subsequent quarter. The unexpected economic slowdown in France and Germany was a contributing factor, which raised uncertainty about the sustainability of recovery in the region. Hence, unfavorable economic outcomes, together with geopolitical risks related to the Ukrainian crisis, have brought about a downward revision of growth prospects for the Eurozone in 2014 and 2015 (graph 1a). In addition, there are concerns that inflation in the zone will remain below the European Central Bank's (ECB) target and that credit to the private sector –particularly small-sized companies– will not be fully revived. Against this background, the ECB has been putting more aggressive measures in place to bolster economic activity in the continent. Differences are also apparent among advanced economies: whereas the UK has exceeded expectations, the Japanese economy undergoes a slow-growth phase of fiscal reforms and monetary stimuli. The Bank of England is expected to be the first central bank among advanced economies to raise their reference rate in 2015. For its part, the Bank of Japan is under pressure to apply new monetary stimuli, in the event their economic recovery is not robust enough (graph 1c). Owing to a less favorable economic performance in the first half of 2014, as well as concerns of structural and geopolitical nature, economic prospects for emerging economies have been revised down several times in 2014 (graph 1a). Whereas for China downward revisions have been moderate, partly due to the new expansionary measures launched by this country, revisions for Brazil

and Russia have been more significant (graph 1b). As for the former, weak investment and consumption matched by idiosyncratic factors explain a large part of the revision. Regarding the latter, geopolitical tensions stemming from the Ukrainian crisis have eroded foreign investment, domestic production and confidence.

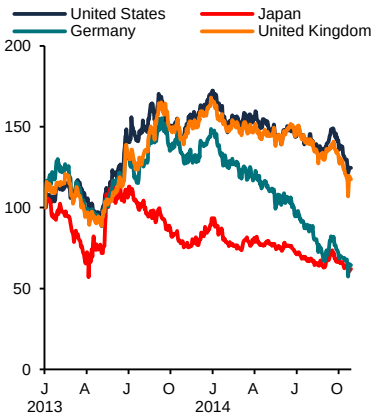
Both the heterogeneous economic performance and divergent monetary policies have brought about substantial adjustments in long-term interest rates and currency prices in major advanced economies. While the US and UK long-term bond yields more than exceed those of Germany and Japan (graph 2a), the US dollar has gone up *vis-à-vis* other major currencies, including the sterling pound (graph 2b) –the US dollar has appreciated *vis-à-vis* currencies of countries where uncertainty over monetary policies is more intense (graph 2c).

In addition, the strength of the US dollar and other diverse demand and supply factors have brought commodity prices down as of April 2014 (graph 3a). Also, as of this date, the pronounced upward trend in commodity prices reverted sharply (graph 3b), whereas energy prices, also in a slightly rising trend, started to decline (graph 3c). The downward adjustment of energy prices has been driven by both expectations of more moderate growth in global demand, particularly in mainland Europe, and the increased world supply of hydrocarbons.

Graph 2
Long-Term Interest Rates and Exchange Rates in Advanced Economies

a) 10-year bond yield in advanced economies

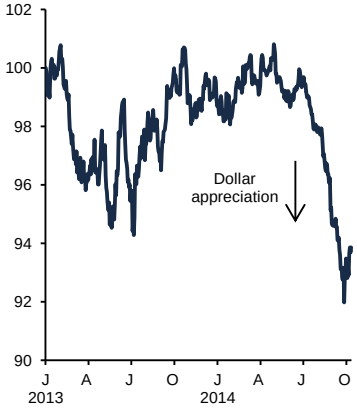
Index Jan- 01-2013 = 100



Figures as of October 20, 2014
Source: Bloomberg

b) US dollar index[1/]

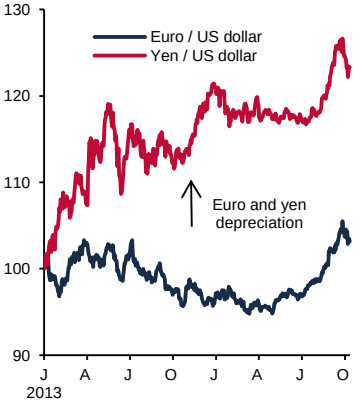
Index Jan- 01-2013 = 100



Figures as of October 20, 2014
Source: Bloomberg

c) Euro/US dollar and yen/ US dollar indices

Index Jan- 01-2013 = 100

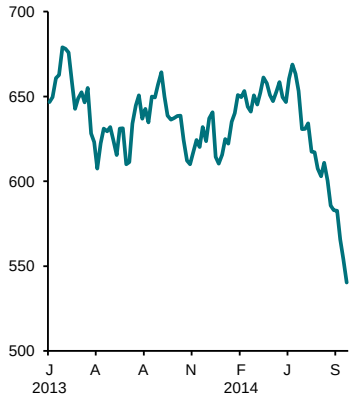


Figures as of October 20, 2014
Source: Bloomberg

1/ Refers to the *DXY* index estimated by Intercontinental Exchange (*ICE*) based on a weighted average of the US dollar value *vis-à-vis* a basket of 6 major currencies: EUR: 57.6 percent, JPY: 13.6 percent, GBP: 11.9 percent, CAD: 9.1 percent, SEK: 4.2 percent, and CHF: 3.6 percent.

Graph 3
Commodity, Food and Energy Indices

a) Commodity index



Figures as of October 20, 2014
Source: Bloomberg (S&P GSCI Index)

b) Food index

Figures as of October 20, 2014
Source: Bloomberg (S&P GSCI Index)

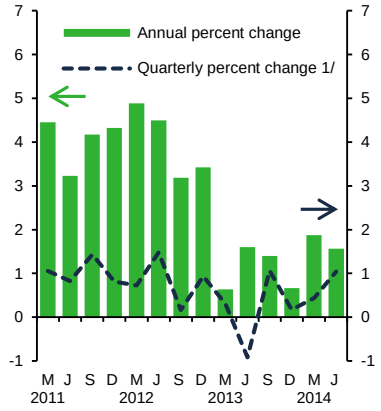
c) Energy index

Figures as of October 20, 2014
Source: Bloomberg (S&P GSCI Index)

In Mexico, following a period of more moderate than expected growth during the first quarter of 2014, economic activity − primarily the construction industry− rebounded in the second quarter (graphs 4a and b). On the other hand, a number of indicators for the third quarter suggest that production has continued to make progress, fueled by both foreign demand and a gradual recovery of domestic demand, albeit with ups and downs. This outlook might indicate that the poor performance observed in the beginning of the year was a temporary event, as shown by growth prospects for 2014 and 2015 (graph 1b). Last, the current account has remained at low levels, easily fundable through foreign direct investment flows (graph 4c). Moreover, international reserves continued to grow and, for the first time in history, they exceeded the amount of 190 billion dollars.

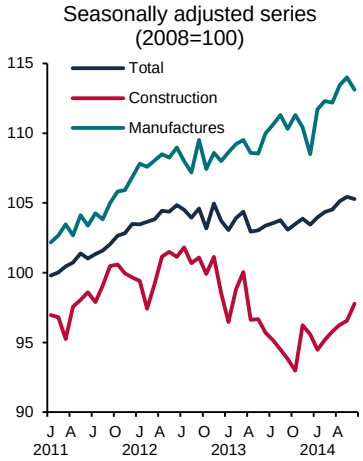
Graph 4
Gross Domestic Product, Industrial Production and Current Account in Mexico

a) Gross Domestic Product



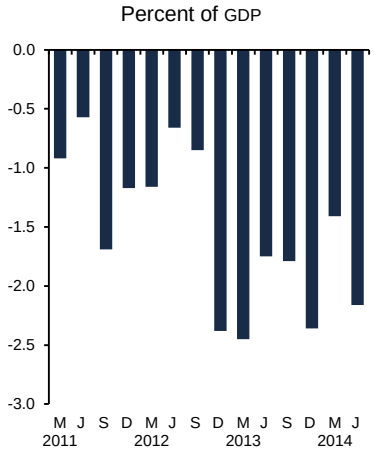
Figures as of June 2014
Source: INEGI
1/ Seasonally adjusted figures

b) Industrial production



Figures as of June 2014
Source: INEGI

c) Current account



Figures as of June 2014
Source: Banco de México

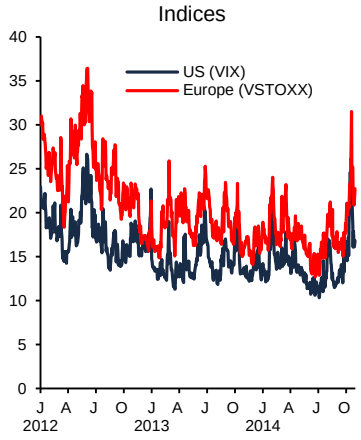
2.2 Macro-Financial Environment

The extraordinary monetary policies implemented in developed countries have targeted the stabilization of international financial markets, while fostering the recovery of global production and employment. Nevertheless, the lengthy monetary stimulus has increasingly and considerably distorted the allocation of resources, with significant potential repercussions on emerging economies. The landscape of low interest rates and record low volatilities (graph 5) has made international investors look for investment alternatives with greater returns, disregarding implied risks.[2]

[2] Low volatility can be attributable not only to lower uncertainty over the economy, but also to monetary policies in developed countries. This has led to an increase in investors' risk-taking. See the quarterly BIS report of September 2014.

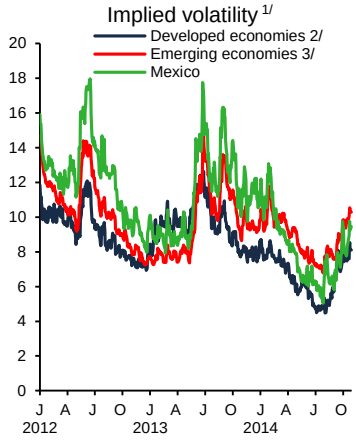
Graph 5
Volatility Indices

a) Stock markets



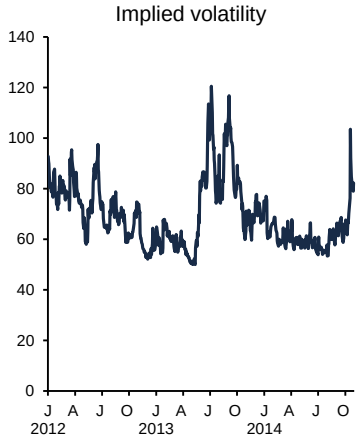
Figures as of October 20, 2014
Source: Bloomberg

b) Exchange markets



Figures as of October 20, 2014
Source: Bloomberg

c) Treasury bonds4/



Figures as of October 20, 2014
Source: Bloomberg

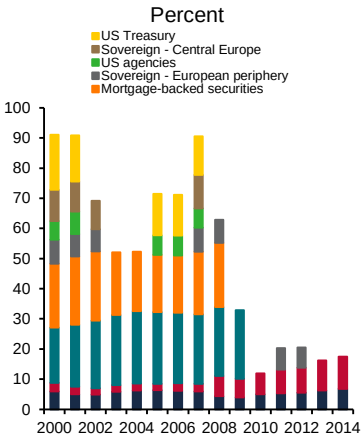
1/ Implied volatility for one-month at-the-money options
2/ US dollar *vis-à-vis* euro, yen, pound sterling and Swiss franc.
3/ US dollar *vis-à-vis* currencies from Brazil, Chile, Colombia, South Korea, India, Peru, Poland, South Africa and Turkey.
4/ *Merrill Lynch Option Volatility Estimate Index (MOVE)*, Jan-01-2000= 100

This situation has given way to a not inconsiderable reallocation of resources towards investments of greater risk and purchases of financial assets in emerging economies (graph 6a). Overlooking risks translated into a substantial compression of risk premia, the relaxation of loan granting terms in advanced economies and a significant increase in the leveraging of companies in developed countries, who profited from the favorable existing conditions to tap funds. Nevertheless, this was not always reflected into an upturn of physical investment; quite on the contrary, it has remained weak, particularly in developed countries.

A not inconsiderable proportion of fund flows towards emerging economies have been channeled through debt and stock markets, instead of via commercial banks. This has reinforced fixed income markets in such economies –the balance thereof, mainly comprised of local-currency-denominated issuances, jumped from 8.1 billion dollars in 2008 to above 14.5 billion dollars in 2013 (graph 6b), whereas the stock market soared from 6.3 to 16.4 billion dollars in the same period.

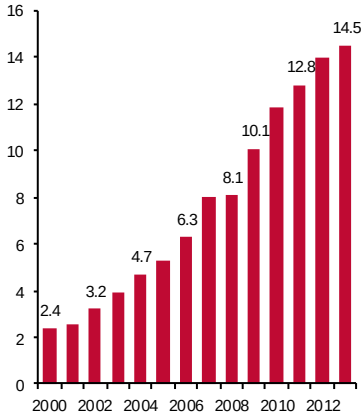
Graph 6
International Financial Market Indicators

a) Securities with yields above four percent



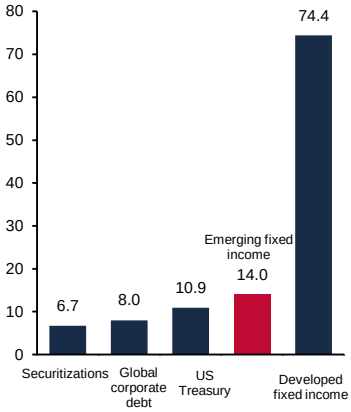
Figures as of June 2014
Source: Blackrock Investment Institute, Barclays and Thomson Reuters

b) Universe of fixed-income securities in emerging economies[1/]



Figures as of December 2013
Source: JP Morgan

c) Fixed-income securities in advanced and emerging economies



Figures as of December 2012
Source: Bank of America

1/ Approximately 86 percent of debt issuances are denominated in local currencies, while the remainder in foreign currencies (mainly in US dollars). 59 percent corresponds to Asian countries, 25 percent to Latin American economies, 10 percent to Eastern European economies and 6 percent to Middle-Eastern and African economies.

The implementation of more strict capital and liquidity regulation, as well as changes in business lines and structures of global banks are increasing financial intermediation via investment vehicles and transactions not subject to traditional banking regulation. Liquidity risk faced by such vehicles and transactions during stress periods is generally substantial.

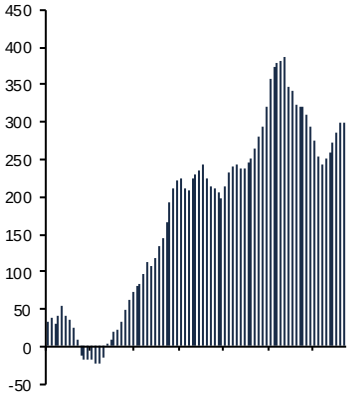
In certain emerging economies, global investors' securities holdings account for a large part of the total outstanding amount (graph 7b). This has heightened the probability of significant volatility bouts owing to global investors' asset reallocation. This situation is of utmost importance in the face of the approaching normalization of monetary policies in advanced economies, particularly in the US.

As of October 2013, foreign investment in government debt securities in Mexico accounted for 36.3 percent of total outstanding amount (graph 7c); this share has remained the same despite several bouts of international financial volatility as of May 2013. As of the same date, investment in equities amounted to 33.6 percent of the value of the Mexican Stock Exchange (BMV) market capitalization.

Mexican companies have taken advantage of ample liquidity to issue debt abroad in highly favorable conditions. This has released bank funds for medium- and small-sized companies. Interest in Mexican debt securities increased since the Mexican governmental debt was included in the *World Government Bond Index* (WGBI), as numerous international investors seek to diversify their investment portfolios according to the composition of said indices.

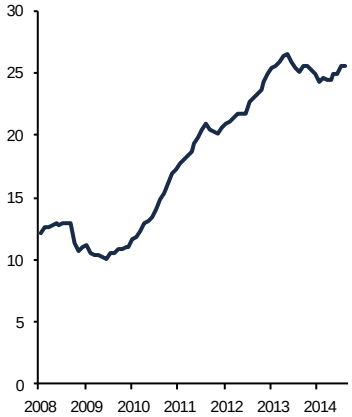
Graph 7
Financial Market Indicators of Emerging Economies

a) Accumulated capital flows towards emerging economies[1/]



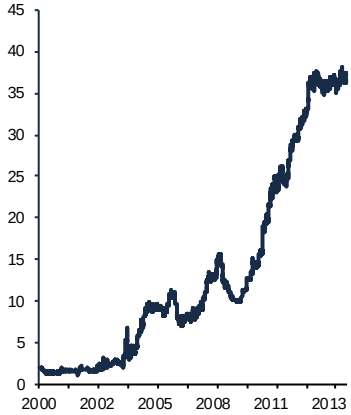
Figures as of September 2014
Source: EPFR Global

b) Foreign investors' holdings of emerging countries' sovereign bonds denominated in local currency[2/]



Figures as of August 2014
Source: Banco de México, Ministries of Finance, Central Banks and other authorities.

c) Foreign investors' holdings of Mexican sovereign bonds denominated in pesos



Figures as of October 20, 2014
Source: Banco de México

1/ Includes stocks and debt from monthly data.
2/ Average from selected countries: Mexico, Peru, Colombia, Brazil, Indonesia, Malaysia, Thailand, Poland, Turkey, Israel, Russia, Hungary, South Africa and South Korea (as of December 2009).

The proportion of global investment funds as a financing source for emerging economies has gained in importance, although no more than 8.0 percent of total funds are destined to these economies' assets. Nevertheless, for emerging economies, the proportion of invested funds *vis-à-vis* the size of their financial markets is considerable. Henceforth, investment strategies of global fund managers have an increasingly important role in the performance of emerging financial markets (box 1).

Box 1

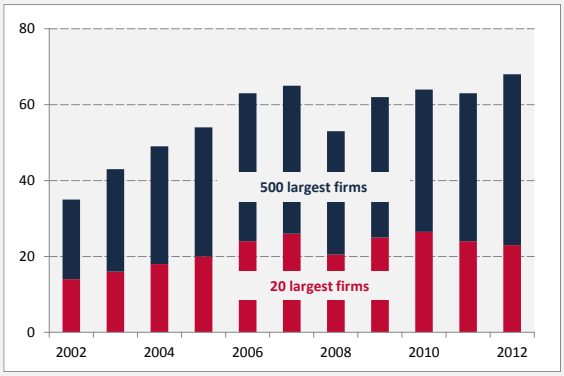
Investment Fund Managers

Increasing funds have been transacted by institutions not subject to traditional banking regulation. For instance, asset management firms invest on behalf of their customers, whether individuals or corporations, in diverse mutual funds, market securities and instruments, including indexed products and exchange traded funds (ETFs).

Asset management firms have substantially grown on the basis of the transactions described above, Even though they experienced a slowdown in the wake of the 2008 financial crisis, they got back on track as soon as international markets recovered. Between 2002 and 2012, the 500 largest managers in the industry doubled assets managed, reaching a balance of seventy trillion dollars at the end of said period.

The five major asset management firms, ranked by amount of assets managed (denominated in trillions of dollars), are: BlackRock (3.79), Allianz Group (2.45), Vanguard Group (2.22), State Street Global Advisors (2.09) and Fidelity Investments (1.89). These firms account for 18 percent of assets owned by the 500 largest managers, whereas the twenty largest firms manage approximately 40 percent.

Funds Managed by Major Asset Management Firms
Billions of dollars



Figures as of December 2012
Source: Towers Watson

In a context of low interest rates in developed countries, investors started to seek higher returns in other countries, and this is the reason why the share of asset management firms in emerging economies started to soar (see graph 7b).

In 2014, more than 25 percent of local-currency-denominated government bonds in emerging economies were in hands of foreign investors.[1] This was a result of the substantial increase in the share of emerging economies' assets within management firms' investment portfolios. As of February 2014, 13 percent of asset management firms' equity investment was held in emerging economies. For their part, management firms allocated 7 percent of their investments in said countries.[2]

Allocation of Managed Funds by the 20 Largest Mutual Funds (By Type of Asset)
Investment by type of asset

	2007	2008	2009	2010	2011	2012
Total net assets (billions of dollars)	18	14.4	18.7	20.4	20.3	22.9
Percentage share						
Total bonds	26.1	32.2	33.1	34.6	37.8	39.4
US bonds	20	25.5	24.1	24.7	25.6	26.3
Bonds from other countries	6	6.8	9.1	10	12.2	13.1
Total equities	49.6	36.1	42.7	45	41.9	42.7
US equities	27.9	21.5	23.4	25.3	24.8	25.1
Equities from other countrie	21.7	14.5	19.2	19.7	17.1	17.6
Other assets	24.3	31.7	24.2	20.4	20.3	18
Cash and cash equivalents	20.4	27.4	20.5	16.2	16.2	14.2
Real estate	1.3	1.5	0.9	0.9	1.1	1.1
Alternative investments	2.6	2.8	2.8	3.2	3	2.7

Figures as of December 2012
Source: BIS with data from Institutional Investor

[1] Brazil, Colombia, Korea, Hungary, Malaysia, Mexico, Peru, Poland, South Africa, Thailand and Turkey. Figures from Haver Analytics, Ministries of Finance and Central Banks.

[2] For the 20 largest companies, this figure represents an investment of 0.63 and 1.27 trillion dollars in emerging economies' bond markets and stock markets, respectively.

The spike in international financial volatility of 2013 had a greater impact on prices of emerging economies' assets than on those of advanced economies –concurrently, international investors drew a sharper distinction among assets of emerging economies. In other words, in a context characterized by the search for yield and high risks associated with flow reversals, international investors follow up the fundamental differences among emerging economies more closely. All this, in order to fine-tune their investment strategies, and taking into account both economic and geopolitical aspects.

Managers of these funds pay greater attention to returns on individual assets and less to the joint performance of assets of the same kind, such as “emerging economies” or “high yield”, among others. Therefore, investment decisions on these funds are increasingly sensitive to the performance of the corresponding company, market or economy. As a result, local micro-financial circumstances, such as inflation, public deficit, soundness of the financial system, current account balance and economic growth prospects play a more significant role in the market. Likewise, a growing proportion of global funds is destined to local-currency-denominated financial assets; consequently, exchange rate volatility has become increasingly relevant for investment decisions.

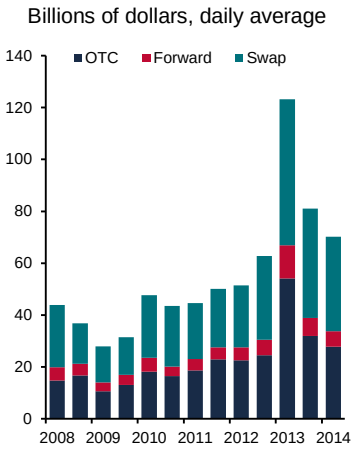
Mexico continues to stand out among emerging economies given the favorable performance of major macro-financial variables: reasonable levels of fiscal deficit and public debt, a sustainable current account and low inflation. Thanks to the approval of key structural reforms, particularly in the telecommunications and energy sectors, Mexico has paved the way for higher economic growth.

On the other hand, the peso exchange rate has been remarkably stable, exhibiting orderly adjustments and no liquidity-related disruptions. This can be explained by both the performance of major macroeconomic variables and the characteristics of the peso exchange market. A number of factors have played a part in making the peso one of the most traded currencies among emerging economies (graph 8c): a floating exchange regime, free capital mobility, the possibility of trading 24 hours a day (graph 8b), and efforts made by financial authorities to act in a transparent and foreseeable manner, in line with market rules. All this contributes to the exchange rate stability of the peso (graph 9a); although at times, it is used by investors to cover their positions in less liquid markets.

In sum, numerous factors, such as events related to the search for yields in domestic and international markets, the sharp compression of risk premia, increased intermediation through debt markets and the higher impact of global asset managers on the volatility of capital flows have made the global financial system, and particularly that of emerging economies, more sensitive to all kinds of triggers.

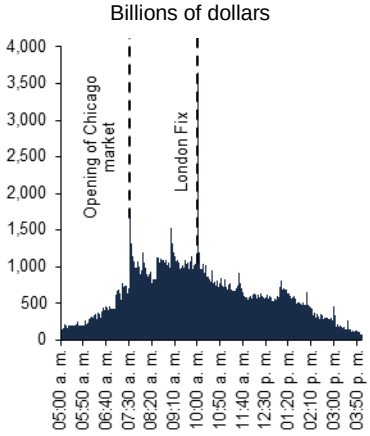
Graph 8
Foreign Exchange Market for the Mexican Peso

a) Global traded volume per day in OTC, forward and swap markets



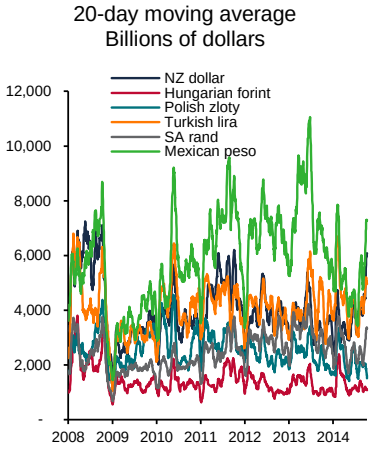
Figures as of April 2014
Source: Banco de México based on the *BIS* Triennial Survey and the Biannual Surveys of the US Federal Reserve and the Bank of England.

b) Intraday traded volume on electronic platforms in the OTC MXP/USD market



Figures as of October 2014
Source: Banco de México

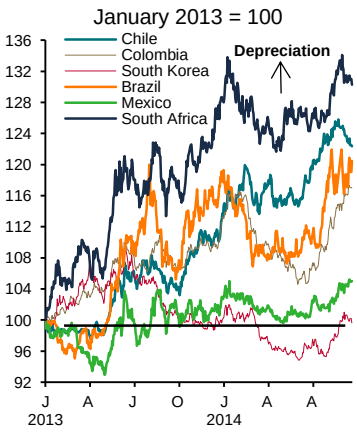
c) Daily traded volume on electronic platforms in the OTC market



Figures as of October 20, 2014
Source: Reuters

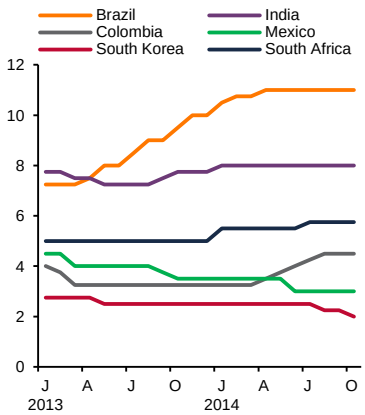
Graph 9
Financial Market Indicators of Emerging Economies

a) Exchange rate in emerging economies



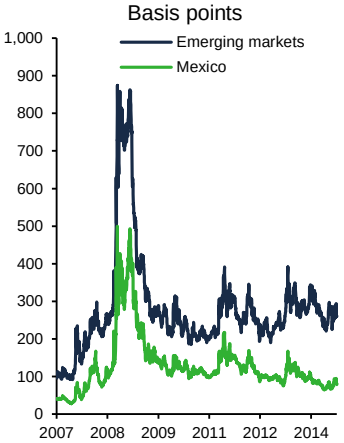
Figures as of October 20, 2014
Source: EPFR Global

b) Monetary policy reference rates of emerging economies



Figures as of October 20, 2014
Source: Bloomberg

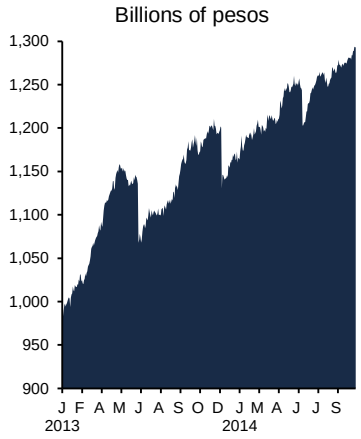
c) Market indicators measuring sovereign credit default swap (CDS)



Figures as of October 20, 2014
Source: Bloomberg

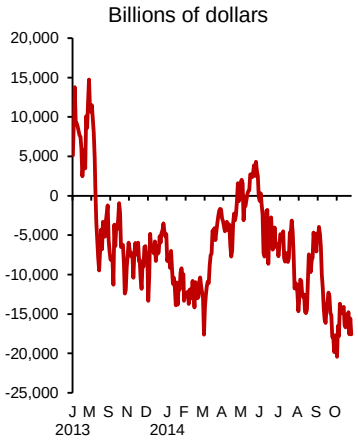
Graph 10
Indicators for Foreign Investors' Risk Positions in Peso Interest Rates and Exchange Rate

a) Foreign investors' holdings of fixed-rate bonds[1/]



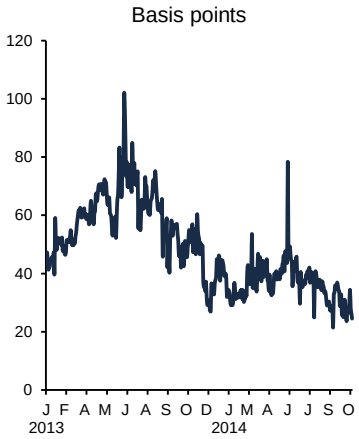
Figures as of October 20, 2014
Source: Banco de México

b) Foreign investors' position in pesos via derivatives[2/]



Figures as of October 20, 2014
Source: Banco de México and Chicago Mercantile Exchange (CME)

c) Spread between 10-year bond yield and 10-year swap



Figures as of October 20, 2014
Source: Bloomberg

1/ Sharp declines in foreign investors' holdings of securities are to a large extent due to bonds reaching final maturity. For instance, 75 billion pesos in fixed-rate bonds reached final maturity on June 20, 2013.
2/ Includes the speculative peso position at the *CME* and the foreign investors' net long position in forward markets through domestic financial intermediaries

An unforeseen generalized reaction to surprises in the normalization process of US monetary policy by either international investors or asset managers could become one of said triggers. In an extreme case, in contemplation of minimizing losses, this deviation could turn the search for yield into a global search for security, or even degenerate into a fall-off in US Treasury bond interest rates, matched by hikes in virtually all sovereign bond rates. During the cycles of interest rate surges (1994-1995 and 1999-2001) in the US, financial crises took place, which had an impact on emerging economies and led to the search for security in international financial markets. In contrast, during the normalization cycle (2004-2007), no extraordinary events were registered. Henceforth, the main question is whether deviations in the normalization of monetary policy in the next cycle could give way to global risk aversion. The volatility period recorded last year owing to the Fed's statements about a possible reduction in asset purchases suggests that there is a positive answer to this question –although an event of such nature seems less likely now, given the progress achieved by the Fed in disclosing its prospective guide.

Last, aside from possible surprises in the normalization of the US monetary policy, other events might trigger global stress episodes; namely, a global economic slowdown or the worsening of geopolitical conflicts. Another unexpected shock could stem from the insolvency or lack of liquidity of entities not subject to traditional financial regulation. These entities are becoming increasingly important for channeling financial funds in both advanced and emerging

economies. Thus, risks related to their operation are relevant, given their interconnection with financial and non-financial firms.

2.3 Credit Risk

As of June 2014, total financing to the non-financial private sector amounted to 5.9 trillion pesos (graph 12a), registering an increase of 8.5 percent in real terms *vis-à-vis* the same period in the previous year. Within this heading, both the vibrant growth of foreign investment −22.3 percent during said period− and banking credit −4.7 percent[3]− are worthy of mention (graph 11a).

The growth in credit to the non-financial private sector in the second half of 2013 and the first half of 2014 was higher than the average recorded throughout last four years, bringing the credit-to-GDP ratio up to 35.8 percent −2.6 percent above its long-term trend (graph 11b). The surge in credit to the non-financial private sector can be explained by an increase in debt placements by Mexican companies overseas; by the way, these companies have capitalized on conditions of ample liquidity and low interest rates in international financial markets.

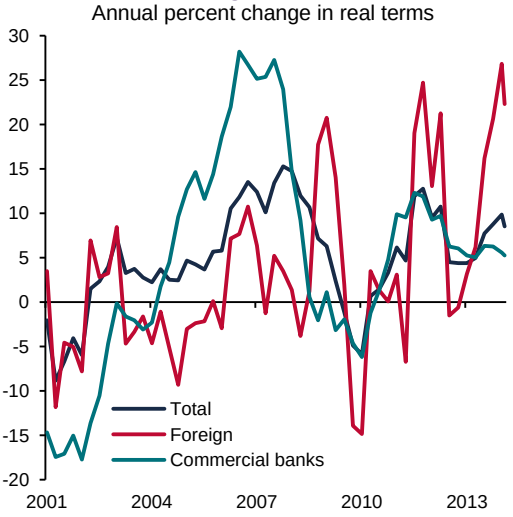
Commercial banks account for the largest share in credit to the non-financial private sector (40.1 percent), followed by foreign intermediaries (24.5 percent) and the Infonavit (16.3 percent) (figure 1 and graph 12a).

[3] This growth rate corresponds to commercial banks' total portfolio balance (current and non-performing loans), including on-balance securities and loans granted by unregulated sofomes of their property.

Graph 11
Credit to the Non-Financial Private Sector

a) Credit granted by commercial banks and foreign entities

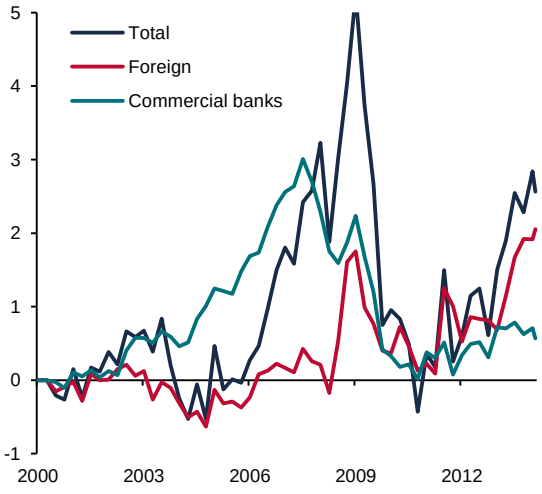
Annual percent change in real terms



Figures as of June 2014
Source: Banco de México

b) Gap between credit-to-GDP and its long-term trend[1/]

Percent

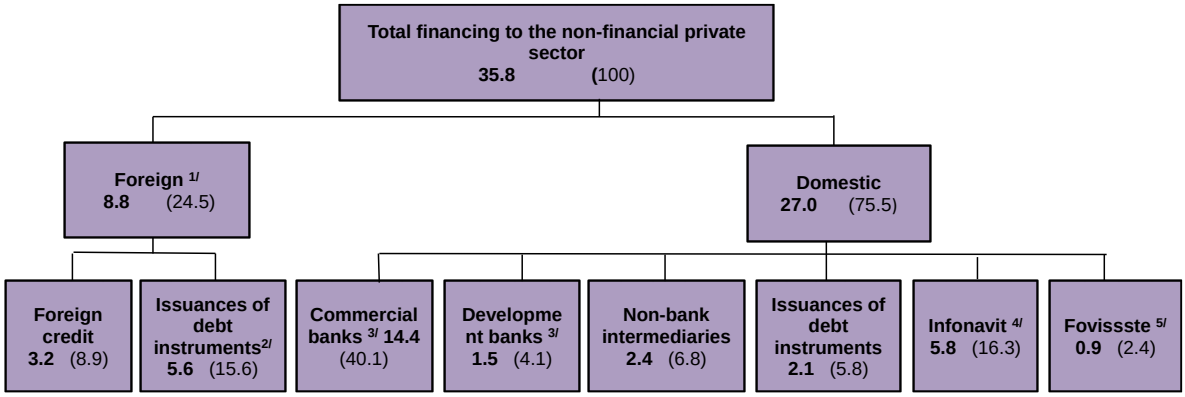


Figures as of June 2014
Source: Banco de México

1/ The long-term trend of the credit-to-GDP ratio is calculated following the relative Basel Committee guidelines, that is, using the one-tailed HP time series filter and a smoothing parameter that takes into account the expected duration of a credit cycle.

Figure 1
Total Financing to the Non-Financial Private Sector

Percentage of GDP (percentage structure)



Figures as of June 2014
Source: Banco de México

1/ This concept was known before as "foreign direct financing". It includes loans from foreign commercial banks, company suppliers and other creditors. Foreign suppliers' data are obtained from balances of companies listed on the BMV, whereas commercial banks' data from Banco de México Survey "Outstanding Consolidated Claims on Mexico".

2/ Commercial paper, bonds and placements overseas.

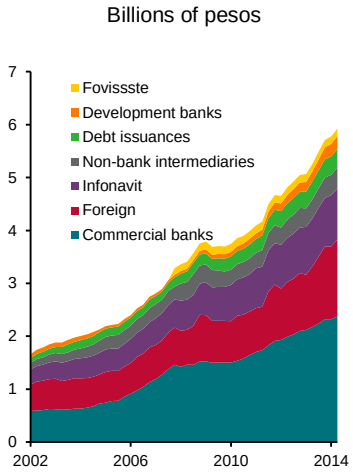
3/ Includes the total direct loan portfolio (current and non-performing) and the portfolio related to restructuring programs (udis).

4/ Corresponds to the National Workers' Housing Fund Institute's (Infonavit) current and non-performing mortgage portfolio.

5/ As of December 2007, data on housing loans granted by ISSSTE's Housing Fund (Fovissste) are included (see explanatory note from the press release "Monetary Aggregate and Financial Activity in January 2010"). This includes current and non-performing portfolios.

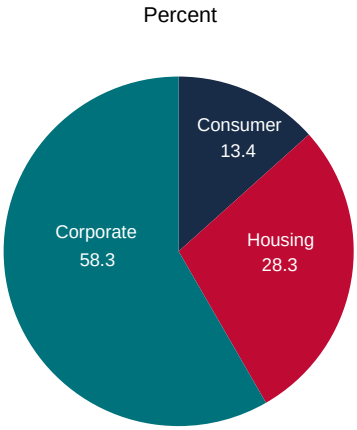
Graph 12
Credit to the Non-Financial Private Sector

a) By type of intermediary



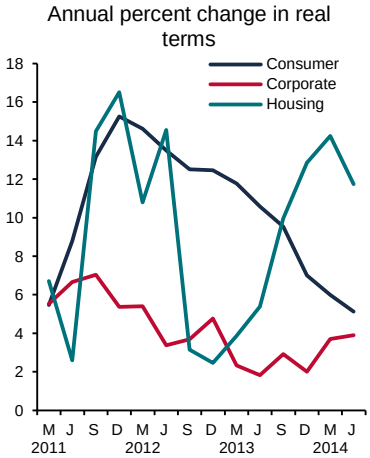
Figures as of June 2014
Source: Banco de México

b) By type of loan



Figures as of June 2014
Source: Banco de México

c) By type of loan



Figures as of June 2014
Source: Banco de México

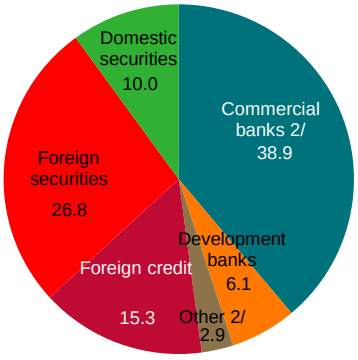
In Mexico, companies are the major recipients of private loans, accounting for 58.3 percent of loans received by the non-financial private sector (graph 12b) −42.1 percent of such funds stem from a foreign source (graph 13a). As of June 2014, loans received by companies grew by 11.8 percent in real terms *vis-à-vis* the same month in the previous year (graph 12c), accounting for 8.8 percent of GDP.

For their part, households received 41.7 percent of loans destined to the non-financial private sector. Mortgage loans represented 67.8 percent of credit granted to households and 28.3 percent of total credit received by the non-financial private sector (graph 12a). As of June 2014, mortgage loans increased 3.9 percent in real terms; within this heading, Infonavit accounted for 57.5 percent of total loans (graph 13b). Last, commercial banks granted 88.5 percent of consumer loans (graph 13c). As of April 2013, commercial banks' value at risk (*VaR*) −measured as a percentage of capital− increased substantially, although it did not reach the levels observed at the end of 2011 (graph 14a).[4] This increase can be explained by two concurrent factors: the credit balance growth above that of capital and the deterioration of consumer credit risk.

[4] Credit *vaR* is estimated using a capitalization and credit risk model. The key elements of this model are: probability of default for every loan, the variance and covariance structure of potential defaults and the structure and concentration level of loans that are part of the portfolio. An explanation of this model can be found on Banco de México's 2006 *Financial System Report* and on Márquez Diez-Canedo, J. (2006), *Una nueva visión del riesgo de crédito*, Limusa. *vaR* is the percentile that corresponds to a given confidence level in a probability loss distribution for a portfolio of assets subject to credit risk. This measure does not provide information about the expected loss level when they exceed the *vaR*. Therefore, the conditional value at risk (*cvaR*) makes possible the analysis of losses in distribution tails, as it represents the expected value of losses when these are higher than the *vaR*.

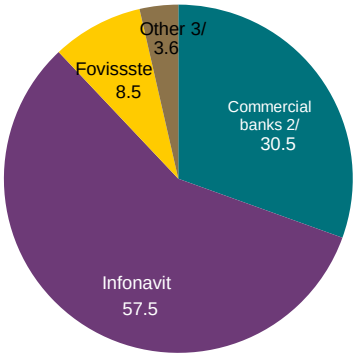
Graph 13
Credit to the Non-Financial Private Sector[1/]

a) Corporate
Percentage of total



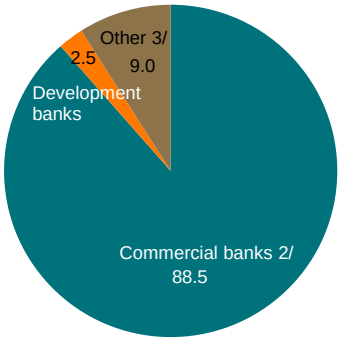
Figures as of June 2014
Source: Banco de México

b) Housing
Percentage of total



Figures as of June 2014
Source: Banco de México

c) Consumer
Percentage of total

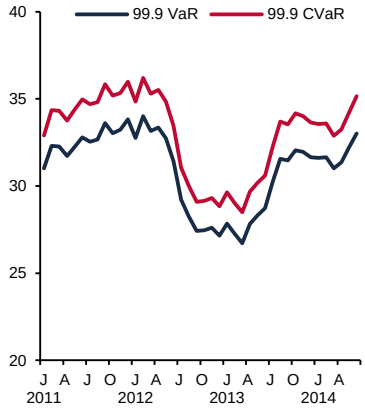


Figures as of June 2014
Source:: Banco de México

1/ Domestic commercial loans include debt issuances.
2/ Commercial bank credit includes loans of regulated sofomes whose accounts are consolidated with the respective bank, in case of being their subsidiary. As of June 2014, these sofomes were: Tarjetas Banamex, Servicios F. Soriana, Santander Consumo, Santander Vivienda, Santander Hipotecario, Banorte-Ixe Tarjetas, and CF Credit. This also includes loans granted overseas, while excluding loans granted by banks to their employees.
3/ Includes factoring and leasing companies, credit unions, popular savings and credit entities.

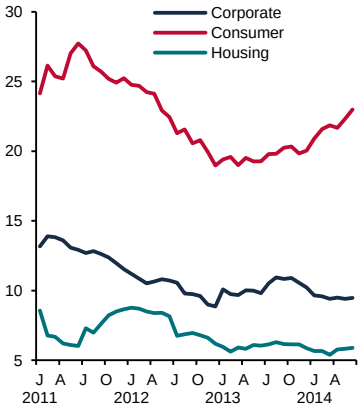
Graph 14
Credit Risk Indicators for Commercial Banks

a) Annual value at risk and conditional value at risk for loan portfolio
Percentage of net capital



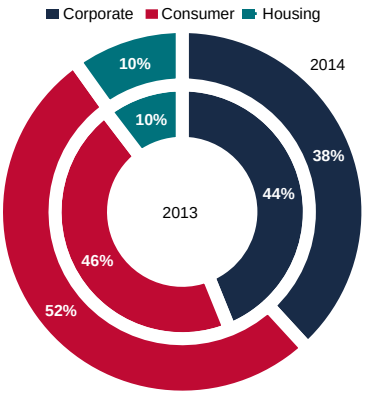
Figures as of June 2014
Source: Banco de México

b) Annual value-at-risk by type of loan
Percentage of net capital



Figures as of June 2014
Source: Banco de México

c) Contribution to risk by type of loan
Percentage of *CVaR*



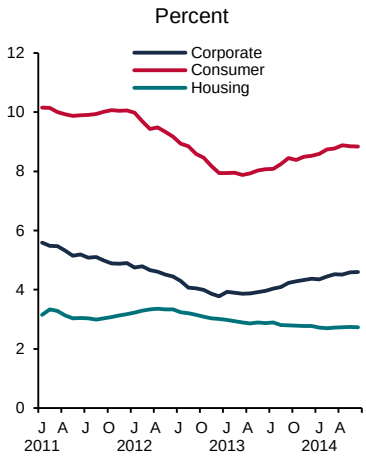
Figures as of June 2014
Source: Banco de México

Consumer loans' *VaR* and conditional value at risk (*CVaR*), measured as a percentage of the current portfolio have increased, and the same can be said of the probability of default (graphs 14a and 15a) and the adjusted delinquency rate[5] of said portfolio –as of June 2014, the latter was 14.3 percent (graph 15c).

The worsening of these indicators was evident in early 2013, when the favorable trend observed during last three years reverted, probably as a result of the economic slowdown. Even though consumer credit only represents 27.0 percent of bank credit to the non-financial private sector, it accounts for more than half of commercial banks' credit risk (graph 14c). Additionally, its default correlation started to pick up as of the end of 2013. Last, the adjusted delinquency rate for the housing portfolio remained constant (5.6 percent), as well as the default correlation between housing and corporate loans (graph 15b).

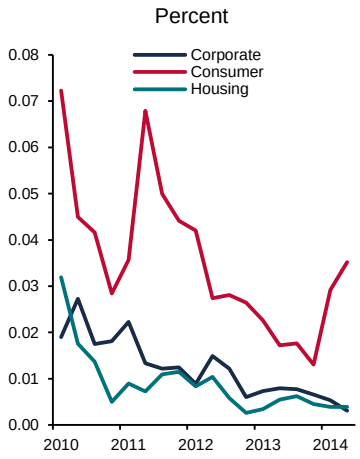
Graph 15
Credit Risk Indicators for Commercial Banks

a) Annual probability of default



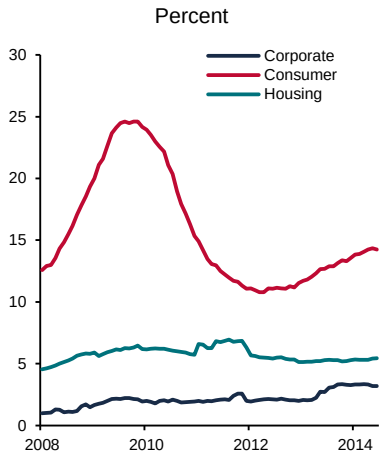
Figures as of June 2014
Source: Banco de México

b) Default correlation



Figures as of June 2014
Source: Banco de México

c) Adjusted delinquency rate



Figures as of September 2014
Source: Banco de México and CNBV

The delinquency rate for corporate loans slightly improved during the second quarter of 2014, although it remains above three percent −a favorable level when compared with housing and consumer loans, but still historically high. A major cause for that level may be found in the problems experienced by certain house building companies, a sector for which delinquency rates remain high. Also, a number of transport companies suffered from payment difficulties in late 2013. Yet, those hardships were temporary and, as of the second quarter of 2014, delinquency for said sector came back to previous levels. All these

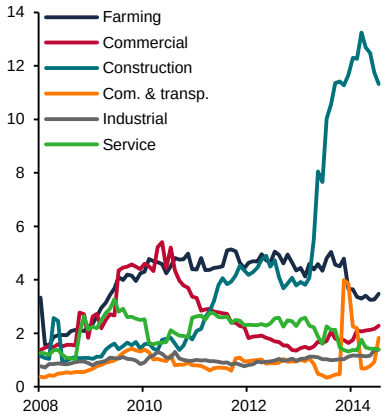
[5] The adjusted delinquency rate results from dividing the non-performing portfolio plus the written-off portfolio over the previous twelve months by the sum of the total portfolio and the written-off portfolio over the last twelve months.

factors contributed to the higher probability of default for the corporate portfolio (graph 15a).

On the other hand, the delinquency rate for the farming sector improved during the first half of 2014 (graph 16a). Yet, risk for this portfolio is still high, as reflected in the probability of default for the sector. The features and inherent risks of credit to the farming sector explain why in the past this heading has received development bank funds to foster bank credit. As of June 2014, 43.0 percent of bank loans in this sector had a certain type of guarantee issued by development banks.

Graph 16
Credit Risk Indicators for Commercial Banks' Corporate Loan Portfolio

a) Delinquency rate by economic sector

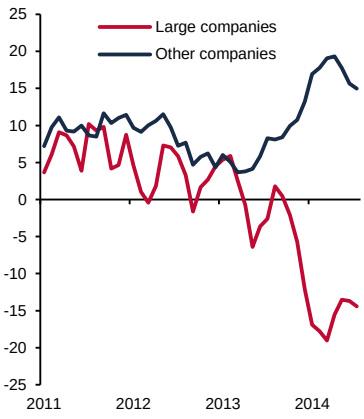


Figures as of June 2014
Source: CNBV

b) Concentration of loans to non-financial private companies[1/]

Figures as of June 2014
Source: CNBV

c) Loans to large firms[2/] and other companies



Figures as of June 2014
Source: CNBV

1/ Portfolio concentration is measured by the Herfindahl-Hirschman index, on the basis of loan amounts.
2/ Large companies are listed firms which are part of the 500 largest companies in the country or having current loans for more than one billion pesos; the rest was classified as "other companies".

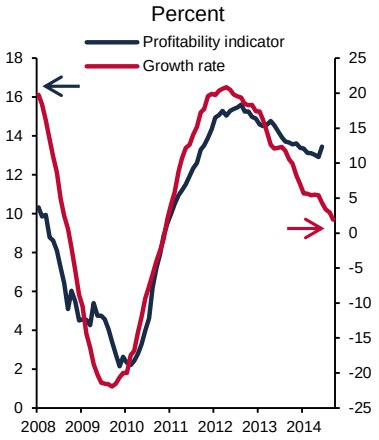
Bank credit to the non-financial private sector has remained concentrated in a small number of borrowers. Nevertheless, the boom in loans to middle- and small-sized companies (graph 16c) has significantly contributed to improving portfolio diversification, and ultimately, to lower concentration risk (graph 16b). Between June 2013 and June 2014, commercial banks granted loans to more than 85 thousand companies that had not received a bank loan at least over the last five years. Companies in this situation account for 26.9 percent of total companies which, as of June 2014, were being funded by commercial banks.

Consumer credit has exhibited a gradual deterioration, as shown by various risk indicators, such as the probability of default and the adjusted delinquency rate. The latter registered an uptrend that

began in the second quarter of 2012, when it reached its lowest level in the last five years. The slowdown in consumer credit has been matched by same portfolio's lower profitability (graph 17a), an improvement in recent months notwithstanding, which resulted from lower default losses. Higher delinquency has been observed in the credit card, personal and payroll loan sectors, whereas it has been lower in auto purchase loans. Personal loans continue to be the product with the highest risk amidst the consumer portfolio (graphs 17 b and c).

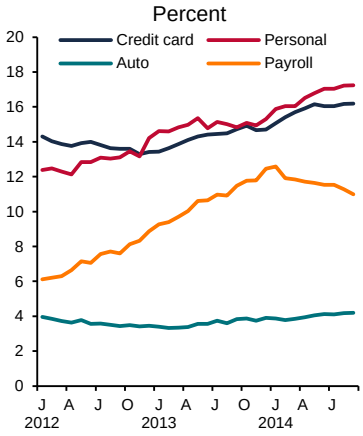
Graph 17
Consumer Credit

a) Profitability indicator[1/] and consumer credit growth



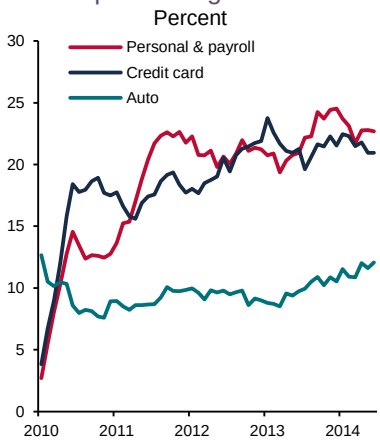
Figures as of September 2014
Source: Banco de México

b) Adjusted delinquency rate



Figures as of September 2014
Source: Banco de México with Credit Bureau data

c) Borrowers whose loans in arrears became non-performing loans



Figures as of June 2014
Source: Banco de México

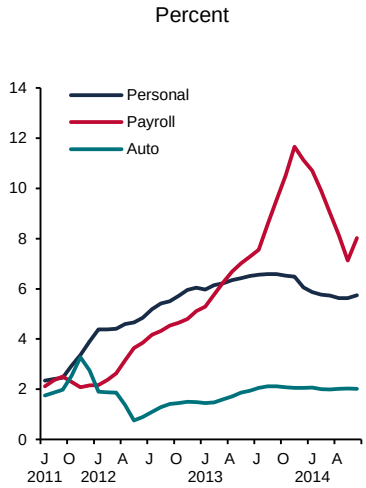
1/ The profitability indicator is obtained by using the accumulated figure for the last twelve months of the following calculation: interest income minus write-offs and reserves exceeding write-offs. The result is divided by the average portfolio over last twelve months, and then the TIIE as funding rate is subtracted therefrom.

The deterioration in payroll loans has ceased, probably owing to an improvement in origination criteria. This is inferred from the reduction in initial reserves resulting from expected losses (graph 18a).[6] Simultaneously, the personal loan portfolio continued to substantially deteriorate (graphs 17b and 18b).

[6] The CNBV has modified the methodology for bank reserve creation. Hence, reserves shall be calculated on the basis of expected losses and not actual losses. In conformity with the new methodology, reserves must be built up when the loan is granted and must reflect the creditor's expected loss over the next twelve months, derived from granting such loan.

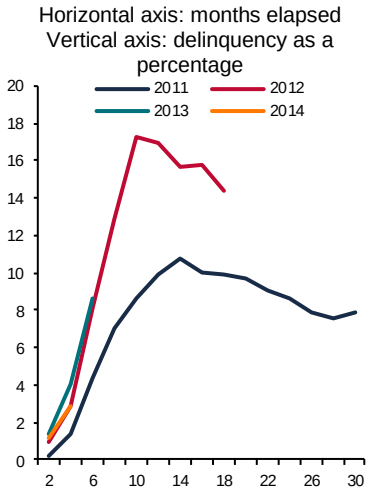
Graph18
Performance of Personal and Payroll Loans

a) Initial reserves for different types of loans/1



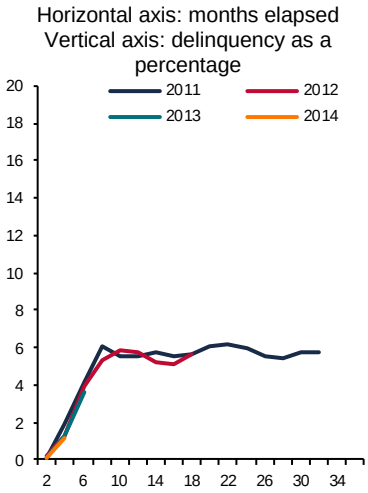
Figures as of June 2014
Source: Banco de México

b) Personal loan vintages



Figures as of June 2014
Source: Banco de México

c) Payroll loan vintages



Figures as of June 2014
Source: Banco de México

1/ Six-month moving average. The regulatory probability of default (RPD) used by the bank to build up loan reserves was used. Initial reserves are calculated by multiplying the RPD by 65 percent of the loan amount.

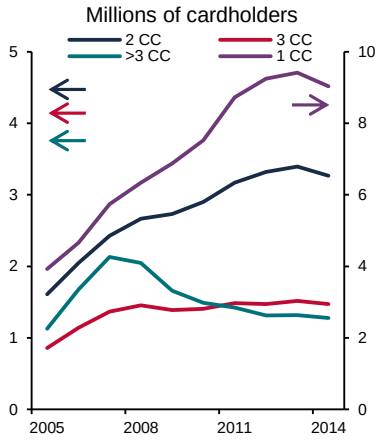
Credit via bank cards has been in a sustained downtrend since 2013. During the first half of 2014, there was a decline in both the number of cards issued and cardholders. The fall in the number of cardholders was mainly observed in the category of cardholders with one or two cards, whereas the number of cardholders with more than three remained constant. Last, the drop in cards granted was sharper in the segment of people without a credit record, which confirms the tightening of banks' origination criteria (graph 20a).

Credit card delinquency has followed the same pattern since 2013, although the worsening was slightly higher during the first half of 2014. Credit Bureau data show that when borrowers default on different types of loans, they usually default on consumer loans first (graph 19b). The data also suggest that delinquency on personal loans is higher than that on credit cards. In addition, the data show that cardholders with personal loans have a higher delinquency rate than cardholders without them (graph 19c). The downturn in credit via cards, together with the boom in the personal and payroll loan portfolios, has led a greater percentage of population to hold both forms of funding (graph 20c).[7]

[7] Data from a representative sample of borrowers registered on the Credit Bureau as of June 2014.

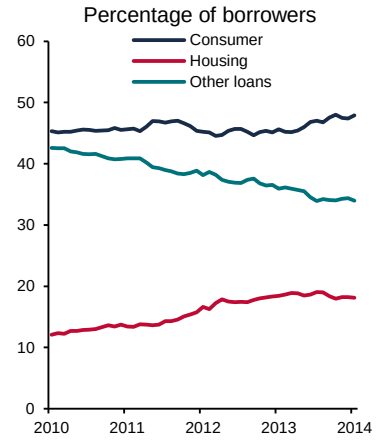
Graph 19
Performance of Consumer Credit

a) Number of cards per customer



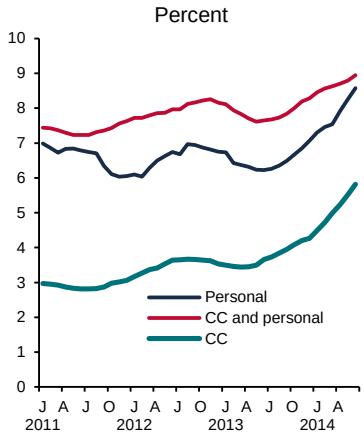
Figures as of June 2014
Source: Credit Bureau

b) First product registering default[1/]



Figures as of June 2014
Source: Credit Bureau

c) Delinquency rate by product

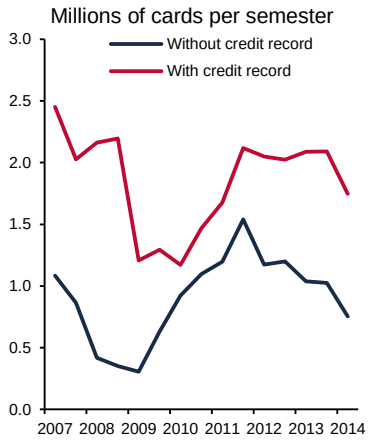


Figures as of June 2014
Source: Credit Bureau

1/ In the consumer and housing headings, bank loans to said segments are included. Non-bank loans are included in "other loans", such as auto loans, department store cards or loans granted by companies pertaining to the service sector.

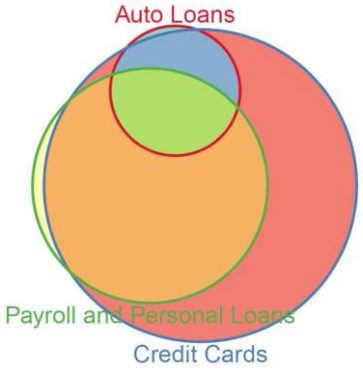
Graph 20
Performance of Consumer Credit

a) New cards granted to customers with and without credit record



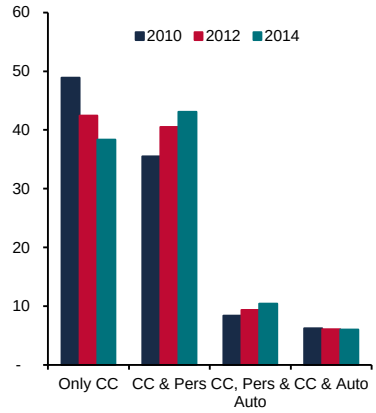
Figures as of June 2014
Source: Credit Bureau

b) Penetration by type of product[1/]



Figures as of June 2014
Source: Banco de México with Credit Bureau data

c) Change in share by type of product



Figures as of June each year
Source: Banco de México with Credit Bureau data

1/ Product penetration was obtained using a representative sample of borrowers on the Credit Bureau having at least one bank consumer loan active as of June 2014.

Commercial bank housing loans have continued to grow, fueled by the expansion of middle and upper income housing, which exhibited annual growth of nearly 10 percent in real terms, the highest rate

registered in such heading since April 2012. In contrast, the low-income housing portfolio began decelerating during the second quarter of 2014, registering an annual contraction of 3.0 percent in real terms. Along these lines, low-income housing loans had not experienced such a decline since late 2009. Higher competition in the housing loan sector has made active interest rates remain at a downtrend (graph 22a) −this has been the case, without experiencing a deterioration in loan granting conditions, such as the Loan-To-Value ratio (LTV or down payment), the Payment-To-Income ratio or the performance of mortgage vintages (graphs 21a and b). This is also reflected in the adjusted delinquency rate for the mortgage portfolio, which shows that the average risk for mortgage debtors has remained constant over the last two years (graph 15c). Nevertheless, products pertaining to said portfolio performed very differently. The delinquency rate for mortgage-backed liquidity loans and house purchase loans increased significantly as of the second half of 2013.

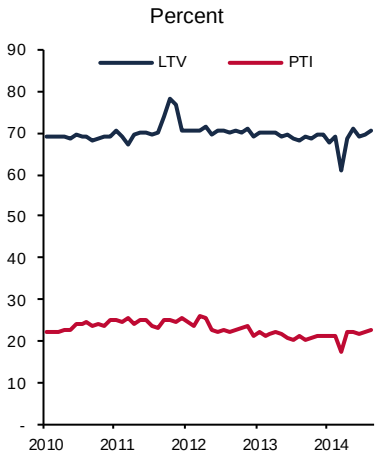
In sharp contrast, the delinquency rate for mortgage loans used to refinance mortgages plummeted (graph 21c). Credit to refinance mortgages will be substantially fostered by changes introduced by the new financial reform aiming at facilitating mortgage subrogation.

Due to the time elapsed between mortgage origination and subrogation, loan subrogation allows the bank acquiring a mortgage originated by another bank to obtain portfolios with greater spreads (graph 22b) as well as debtors with lower than average Debt-To-Income ratios (graph 22c). This is the reason why risk for such portfolios is lower, and hence their delinquency rate too (graph 21c). Even if this type of loans represents only 2 percent of the mortgage loan portfolio, their growth may influence market performance. Indeed, subrogation of mortgage loans exposes mortgage originators to prepayment risk, and this could lead creditors to opt for granting mortgage loans at variable instead of fixed rates, which currently prevail.

The price index computed by the Federal Mortgage Society (SHF in Spanish) increased 3.4 percent at a national level between June 2013 and June 2014, although in some cities and delegations of Mexico City it was considerably higher. For instance, for the above mentioned period, the price index increased 6.5 and 6.6 percent in the Cuauhtémoc and Benito Juárez delegations, respectively. Other sources also confirm diverse dynamics according to zone and type of housing (graphs 23 and 24).

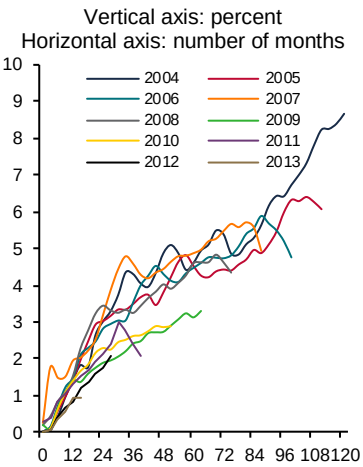
Graph 21
Credit Risk Indicators for Mortgage Loan Portfolio

a) Loan-To-Value (LTV) and Payment-To-Income ratio (PTI)



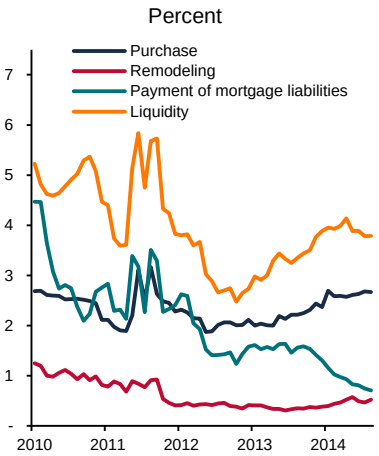
Figures as of August 2014
Source: CNBV

b) Delinquency rate for different mortgage vintages



Figures as of June 2014
Source: CNBV

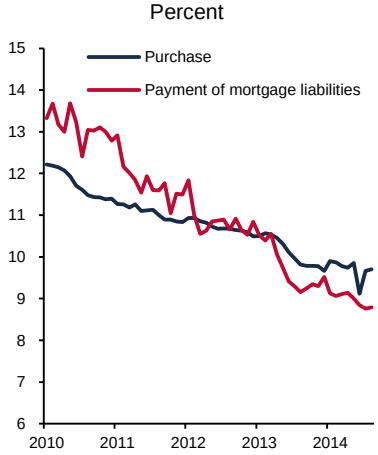
c) Delinquency rate by type of loan



Figures as of August 2014
Source: CNBV

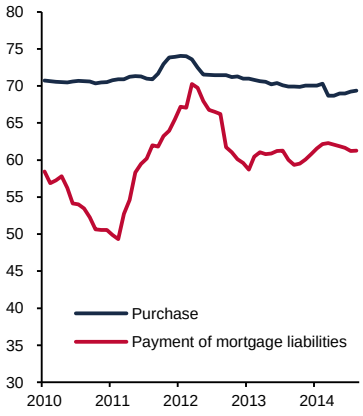
Graph 22
Risk Indicators for Subrogated Portfolio

a) Interest rate for mortgage loans



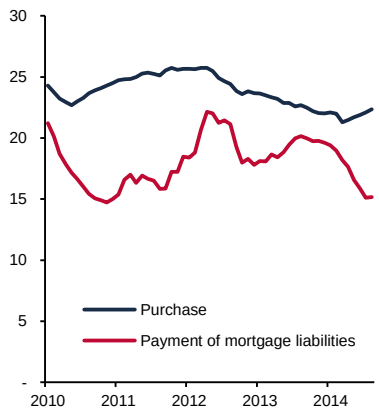
Figures as of August 2014
Source: CNBV
1/ Six-month moving average.

b) Loan-To-Value ratio (LTV)[1/]



Figures as of August 2014
Source: CNBV

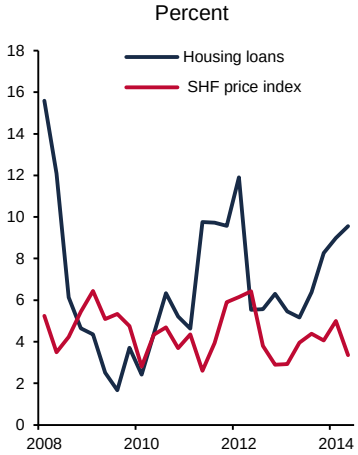
c) Payment-To-Income ratio (PTI)[1/]



Figures as of August 2014
Source: CNBV

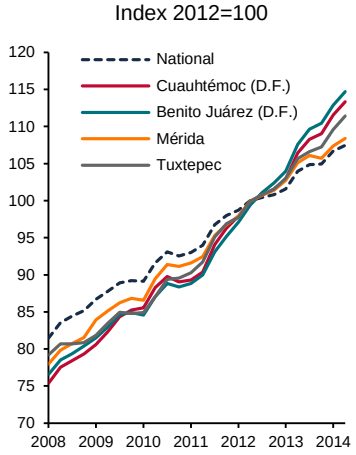
Graph 23
House Price Indicators

a) Annual growth of bank housing loans and SHF price index



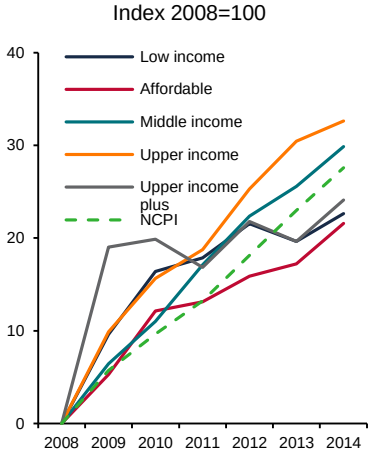
Figures as of June 2014
Source: SHF and Banco de México

b) Municipalities and delegations with higher growth than the national level in the SHF price index



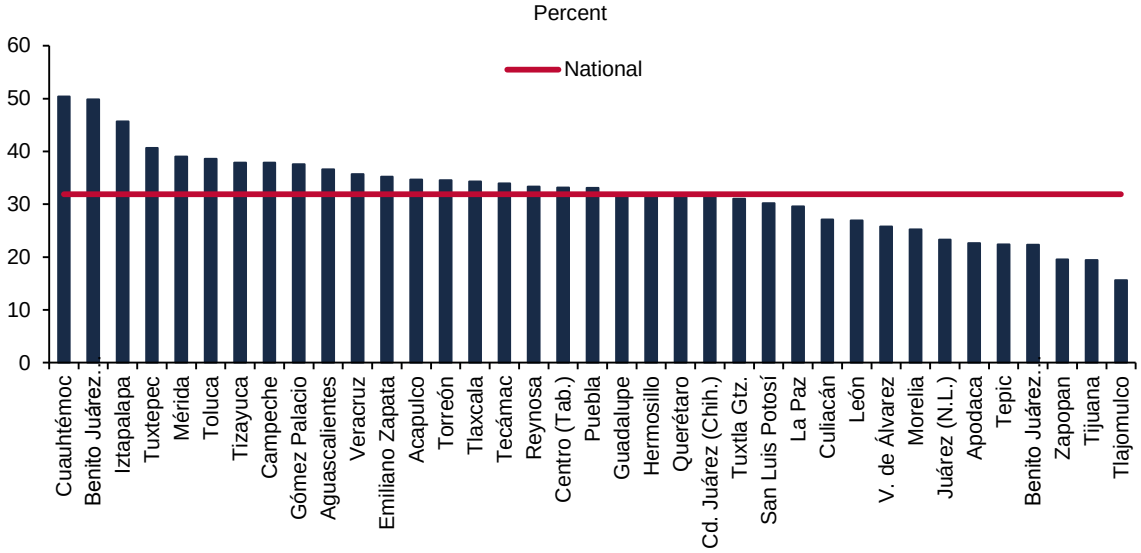
Figures as of June 2014
Source: SHF

c) Price per square meter by type of housing in 28 states



Figures as of June 2014
Source: Softec

Graph 24
Variation in the Federal Mortgage Society Index by Municipality/Delegation between the First Quarter of 2008 and the Second Quarter of 2014



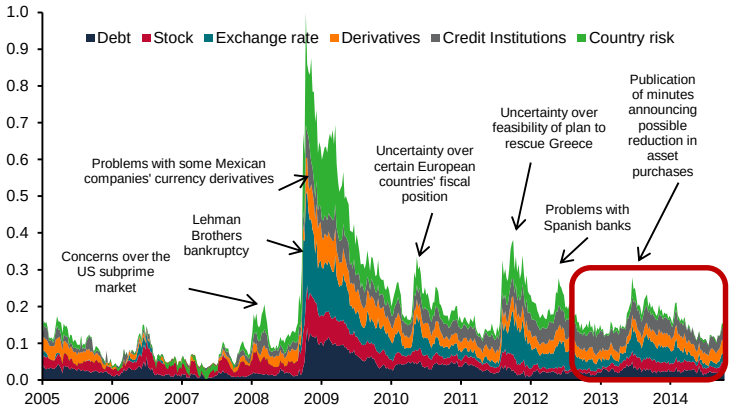
Figures as of June 2014
Source: SHF

2.4 Market Risk

The higher volatility of major financial variables observed in the wake of the disclosure of Fed's minutes in May 2013 vanished by the end of that year, giving way to several months of low volatility in 2014 and a significant reduction in risk premia (graph 25). The environment of relative ease was disrupted by the publication in September 2014 of estimates pointing at a more rapid than expected recovery of the US economy. The release of these figures and revision of others revived investors' expectations of a faster monetary policy normalization by the Fed. As of October 2014, fears of an economic slowdown in Europe translated into volatility in financial markets. As a result, there have been tensions in financial and debt markets, as witnessed by the depreciation in the exchange rate at the end of September and the slight and gradual upturn in long-term interest rates.

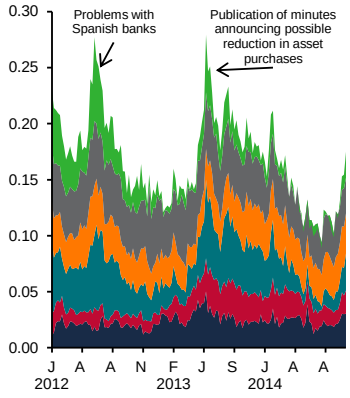
Graph 25
Stress Index

a) Stress Index for Mexican Financial Markets (IEMF in Spanish) and components, 2005-2014[1/]



Figures as of October 20, 2014
Source: Banco de México

b) IEMF and components, 2012-2014[1/]



Figures as of October 20, 2014
Source: Banco de México

1/ The sum of components gives the IEMF on a scale from 0 to 1. Although the components are not independent between them, they were categorized on the basis of the main factor affecting them. The index was calculated using the principal component method.

Table 1 presents the sensitivities of diverse intermediaries' securities portfolios to a 100-basis point expansion in the yield curve. The figures show the percentage change in the value of diverse financial intermediaries' portfolios. Further, financial intermediaries' exposure to interest rate risk has remained at levels similar to those prevailing in 2013, except for brokerage firms, whose exposure to interest rate risk increased. Although said risk is lower than that of other intermediaries such as siefores, it raises greater concerns, since brokerage firms' risk positions are leveraged. At an aggregate level, value losses in said portfolios were not significant. Nonetheless, in case of an abrupt and substantial change in interest rates, some intermediaries may suffer considerable losses (see the "Stress Tests"

section, p. 113). A similar situation is observed in certain financial intermediaries' exposure to stock risk, particularly brokerage firms. Stress tests suggest that, only in extreme scenarios, some financial institutions may face capital problems. In contrast, exposure of major financial intermediaries to stock risk is negligible, in part because it is highly limited by financial regulation.

Table 1
Change in Asset Value given a 100-Basis-Point Increase in the Interest Rate Curve[1/]
Percentage of investment portfolio

Sector	2008 IV	2010 IV	2013 IV	2014 II
Commercial banks	-0.545	-0.224	-0.150	-0.206
Brokerage firms	-0.323	-0.119	-0.114	-0.301
Insurance companies	-0.232	-0.232	-0.250	-0.296
Siefores	-2.449	-1.143	-0.840	-0.836
Mutual funds	-0.472	-0.483	-0.456	-0.560

Figures as of June 2014
Source: Banco de México
1/ Commercial banks' and brokerage firms' sensitivity includes their derivative position.

The international scene has encouraged Mexican companies to issue debt overseas; consequently, some of them might be exposed to stock risk. Available data on risk hedging could be enhanced: since they are not yet standardized, the analysis thereof is an utterly strenuous task. In any case, since most issuances were placed at a fixed-rate and in the long-term, companies do not seem to have incurred big refinancing and interest rate risks, as it will be explained later in the corporate indebtedness subsection, where companies quoted on the BMV are studied.

2.5 Liquidity Risk

Among emerging economies, the Mexican exchange rate market stands out for its free-floating regime, ample liquidity and for operating 24/7. These characteristics have curbed a decline in turnover during bouts of high volatility, ultimately preventing disruptions in the price formation process (graph 26). Thus, adjustments in the peso rate have been orderly, and the exchange market turnover continued to grow during the second half of 2013, remaining high during 2014.

Graph 26
Exchange Market for the Mexican Peso

a) OTC, forward and swap turnover

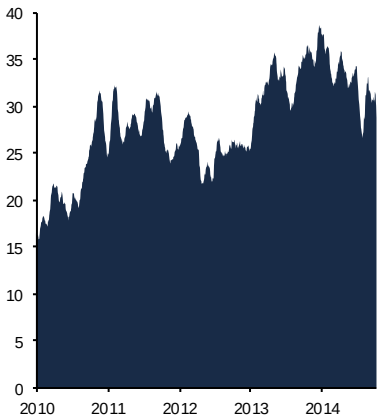


Figure as of October 20, 2014
Source: Banco de México

b) Volatility in the exchange market

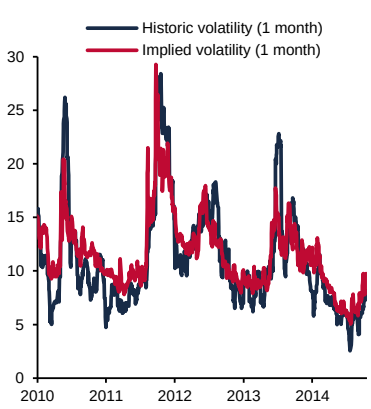


Figure as of October 20, 2014
Source: Banco de México and Bloomberg

c) Bid-ask spread for interbank transactions

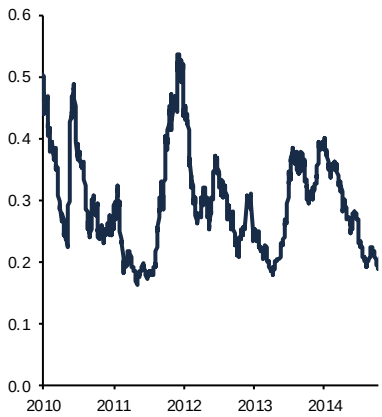
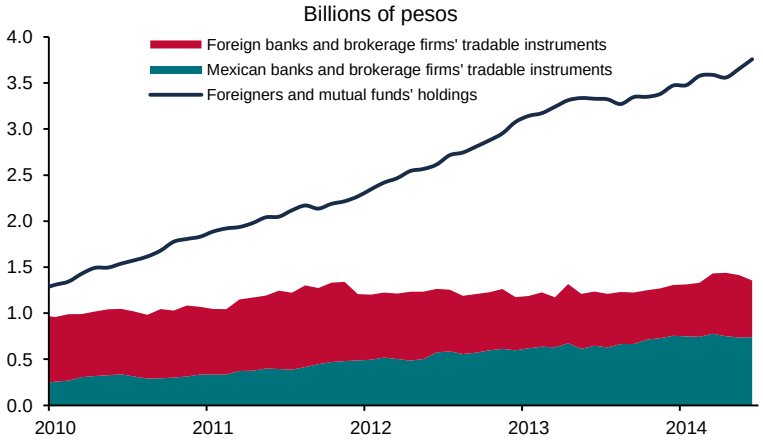


Figure as of October 20, 2014
Source: Banco de México

On the other hand, several factors have contributed to the shrinkage of banks' and other financial entities' securities holdings in global debt markets; namely, the implementation of the international regulation agenda, which considers higher capital and liquidity requirements, as well as measures adopted by US and European financial authorities to restrict banks' operation in securities markets. This has also been the case in Mexico, where banks' and brokerage firms' holdings have grown at a lower rate than the balance of outstanding securities (graph 27a). The increase in open-end investment funds' securities holdings is particularly relevant – especially those held by foreign and domestic funds, and global investment funds managing resources on behalf of their customers. These investors are obliged to settle positions when their customers sell the underlying stock. As it is well known, the existence of financial intermediaries willing to temporarily absorb supply or demand surpluses, by holding securities positions, is of utmost importance for market liquidity.

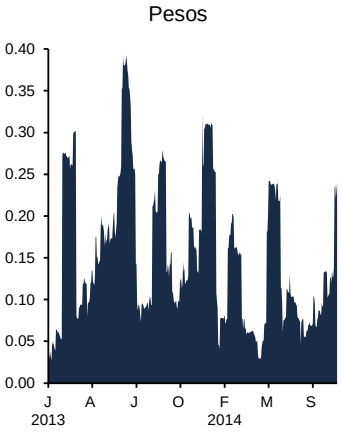
Graph 27
Liquidity in the Government Debt Market

a) Securities held by investment funds and foreigners, and banks' and brokerage firms' tradable instruments



Figures as of June 2014
Source: CNBV

b) Absolute change in the M bond price (Dec. 24) per million traded



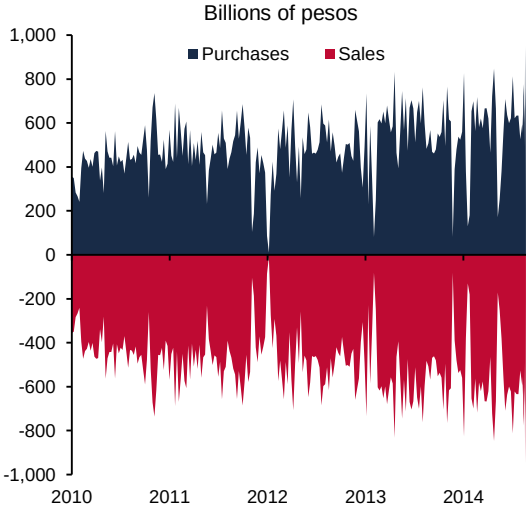
Figures as of October 20, 2014
Source: Banco de México

Graph 28a shows how the trading volume of government instruments has remained high, whereas graph 28b shows that, as of the second quarter of 2013, there has been a decline in the average transaction amount. This fall may be due to lower liquidity, which makes intermediaries reduce transaction volume, or to changes in the ways market participants operate. In fact, debt market transactions have increasingly been carried out electronically instead of via phone – indeed, a higher number of transactions can be more swiftly operated on electronic platforms. Graph 29a presents the average transaction value for various government instruments; for instance, the average transaction volume for cetes has remained high, whereas that of bonds has downtrended.

Although banks and brokerage firms hold lower debt instruments *vis-à-vis* total outstanding amount, the Mexican sovereign debt market has maintained a high level of liquidity, as shown by graph 27b. The graph shows the impact of a one-million transaction on the price of M bonds: the effect was similar to levels observed in March 2014, in spite of the higher volatility currently prevailing in financial markets.

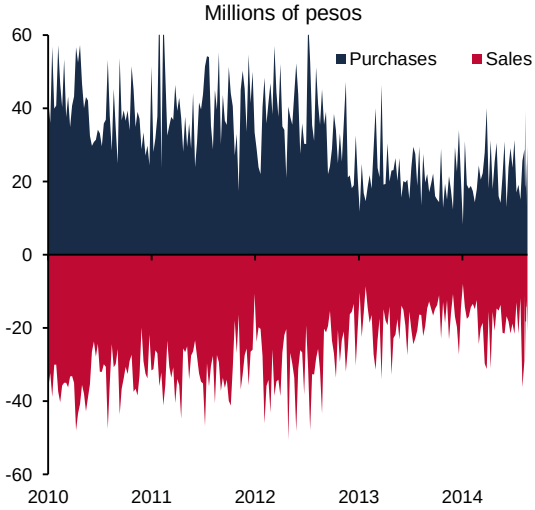
Graph 28
Purchase and Sale Transactions of Government Instruments

a) Weekly trading volume in the secondary market



---Figures as of October 20, 2014
Source: Banco de México

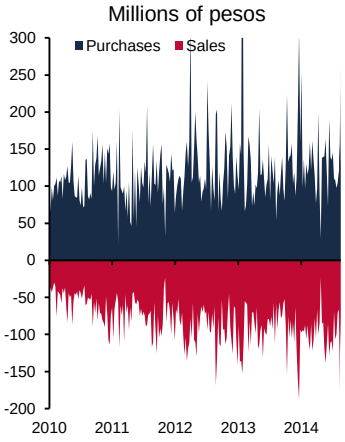
b) Average transaction value in the secondary market



Figures as of October 20, 2014
Source: Banco de México

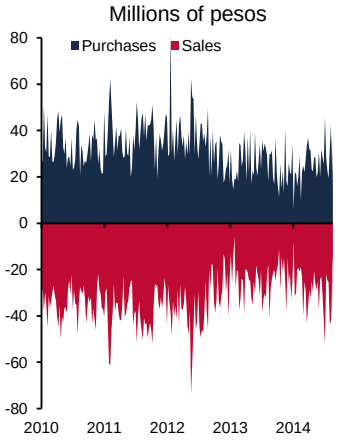
Graph 29
Purchase and Sale Transactions of Government Instruments

a) Average transaction value in the secondary cete market



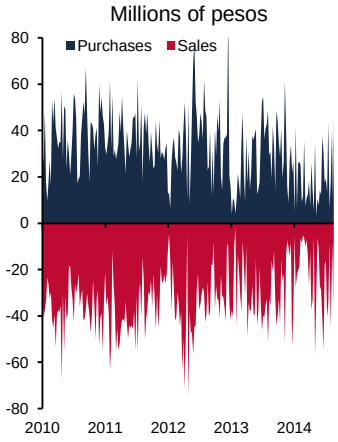
Figures as of October 20, 2014
Source: Banco de México

b) Average transaction value in the secondary bond market



Figures as of October 20, 2014
Source: Banco de México

c) Average transaction value in the secondary udibono market



Figures as of October 20, 2014
Source: Banco de México

2.6 Contagion Risk

The transactions undertaken by financial intermediaries play an essential role in efficiently allocating funds in the economy. Nevertheless, these transactions generate exposures to credit risk among participants of payment systems, and therefore, represent a potential source of contagion.

The interconnection network among entities in the Mexican financial system and its characteristics have evolved throughout time. In order to analyze said interconnections and their evolution, the network was classified according to the type of transactions generating exposures.[8] In this section, we first present the evolution and characteristics of interconnections among financial entities between 2009 and 2014;[9] then, we present an analysis of direct contagion that materializes, *ceteris paribus,* when an institution defaults on obligations and makes others default too. Last, we describe the Mexican financial system's exposure to foreign intermediaries and its evolution over time.

Exposures due to Unsecured Loans and Securities Holdings

The exposure network due to unsecured loans and securities holdings presented in graph 30 shows that, between 2009 and 2014, some banks have gained in relative importance. In addition, the value of exposures to foreign entities has diminished, as well as the number of Mexican banks holding risk positions with foreign entities (mainly unsecured loans and deposits).

The average amount traded by financial intermediary, measured as a percentage of the total amount traded in the network, fell from 3.2 percent in 2009 down to 2.7 percent in 2014. Concurrently, the network density[10] rose in the same period from 12.5 percent up to 14.2 percent.

These figures highlight increased interconnection, particularly towards banks of smaller size. Additionally, there was a reduction in the number of institutions or nodes concentrating a large number of connections.

[8] This network analysis approach is known as analysis of the multiplex structure of network exposure.

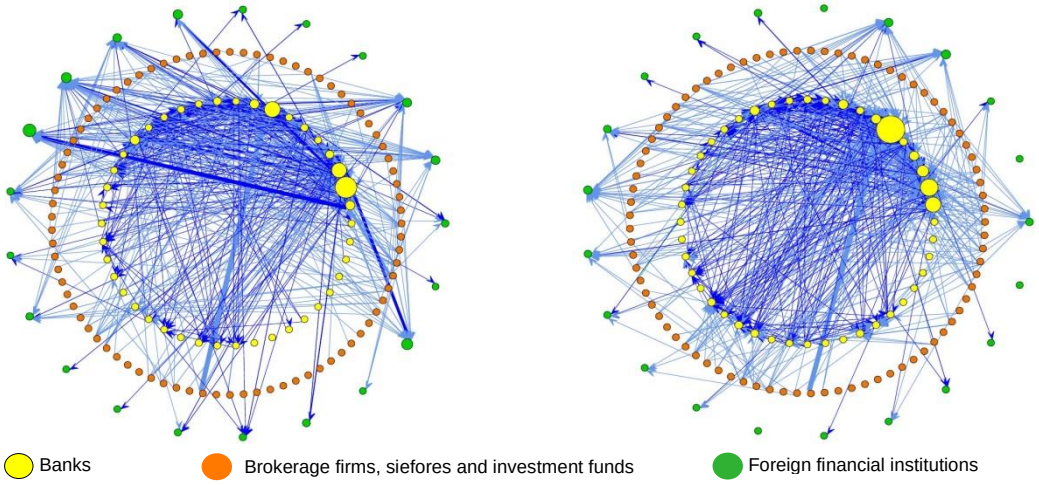
[9] For comparison purposes, we used the average for exposures observed at the end of each month between January and June 2009 and 2014.

[10] Network density indicates the portion of potential connections in a network that are actual connections. Apart from density, there are other useful measures to explore the degree of network connectedness, namely, the size of the largest so called "strongly connected component". Said component is defined as the largest subset of intermediaries, in which for every pair of nodes there is a path connecting them in both directions; in other words, it is the largest subset of intermediaries with greater connectedness. Other measures analyze the evolution of the network core composition. The core is formed by those intermediaries densely connected among them, whereas those that are not in the core have few connections, and nearly all occur with intermediaries that are part of the core.

Graph 30
Exposures due to Unsecured Loans and Securities Holdings

a) January through June 2009

b) January through June 2014



Figures from January through June 2009
Source: Banco de México

Figures from January through June 2014
Source: Banco de México

Exposures due to Derivatives Transactions

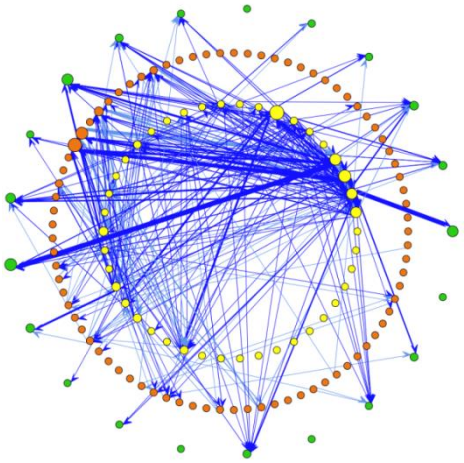
Graph 31 shows the changes in network exposures stemming from derivatives transactions. Average exposure per participant, as a percentage of total network trading volume fell from 5.5 percent down to 4.9 percent in 2014. Further, during the same period, interconnection among institutions spiked when network density increased from 3.5 to 4.2 percent; the number of connections among domestic institutions also increased, while both the number of connections with foreign counterparties and domestic counterparties operating abroad diminished.

Exposures due to Exchange Transactions

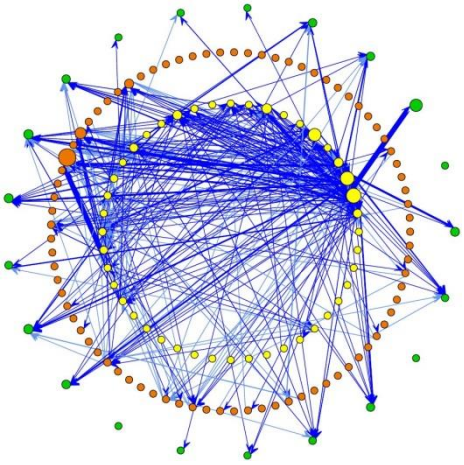
The exposure network related to exchange transactions experienced the most significant changes (graph 32). On one hand, during the period of study, network density fell from 11.3 percent to 7.7 percent. On the other hand, two Mexican financial institutions pertaining to the same group increased their interconnection with the rest of the network. In that sense, both the number and the amount of interconnections among domestic and foreign institutions plunged; the level of said exposures shrank approximately by 16.0 percent. The incorporation of the CLS Bank as a payment settler was perhaps one of the most salient causes for the drop in the number of interconnections,

Graph 31
Exposures due to Derivatives Transactions

a) January through June 2009



b) January through June 2014



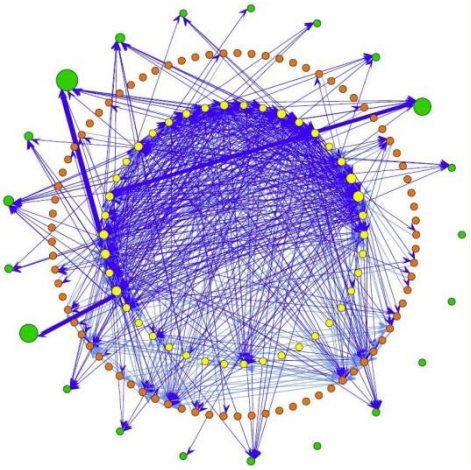
Banks | Brokerage firms, siefores and investment funds | Foreign financial institutions

Figures from January through June 2009
Source: Banco de México

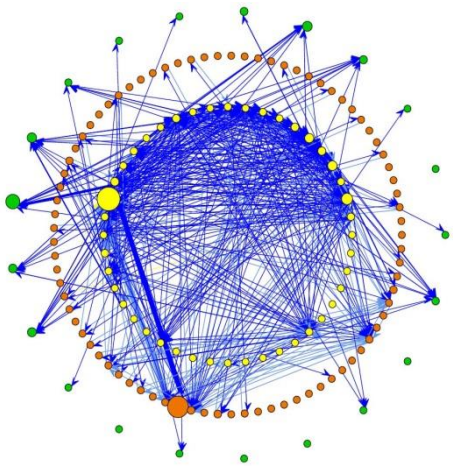
Figures from January through June 2014
Source: Banco de México

Graph 32
Exposures due to Exchange Transactions

a) January through June 2009



b) January through June 2014



Banks | Brokerage firms, siefores and investment funds | Foreign financial institutions

Figures from January through June 2009
Source: Banco de México

Figures from January through June 2014
Source: Banco de México

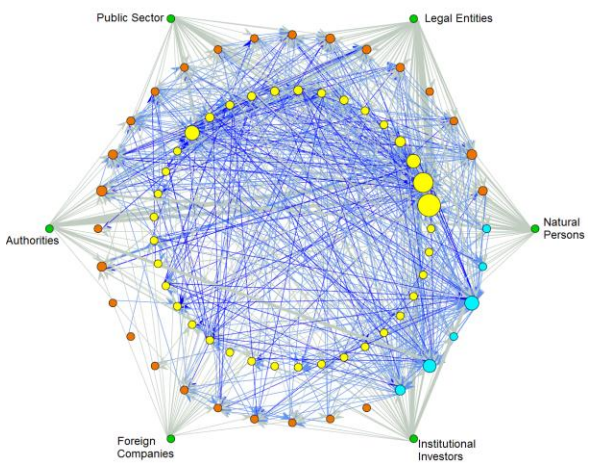
Repo Transaction Networks

Last, the repo transaction network recorded a higher level of connectedness among institutions, as density doubled from 2.9 percent in 2009 to 5.8 percent in 2014, owing to a larger number of banks connected in the financial system. In this network, there doesn't seem to be a single institution whose financing substantially increased. Further, public and foreign funding have decreased, whereas that of domestic individuals and development banks has gone up.

The evolution of interbank exposure networks suggests that, although interconnection among institutions has increased, the average exposure amount has plunged. Therefore, contagion potential will depend on both institutions' capital adequacy ratio and exposures among banks with high interbank exposure-to-capital ratios. As explained below, the number of banks hit by a contagion process has remained relatively constant; thus, the higher system's connectedness has not translated into higher contagion potential.

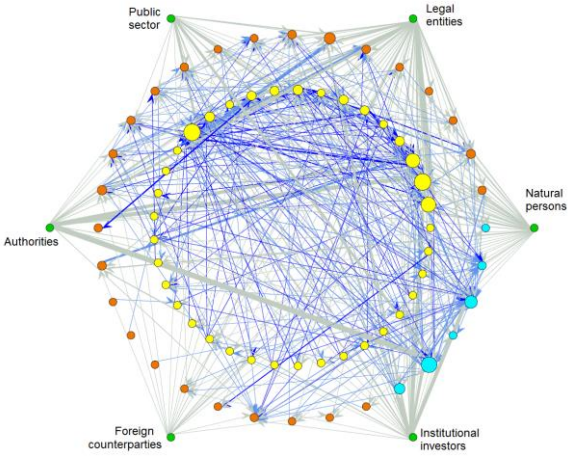
Graph 33
Repo Transactions Networks

a) January through June 2009

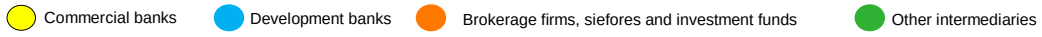


Figures from January through June 2009
Source: Banco de México

b) January through June 2014



Figures from January through June 2014
Source: Banco de México

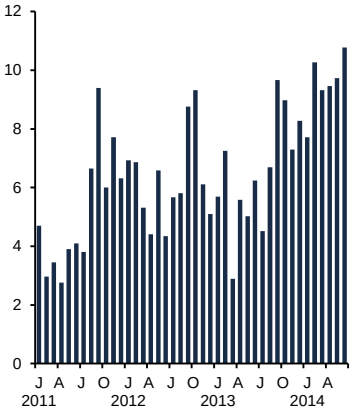


Risk of Direct Contagion

Simulation exercises to estimate contagion risk[11] are performed using networks built on the basis of direct exposures among domestic financial intermediaries. Contagion risk due to direct exposure occurs when any given entity's possible bankruptcy has immediate effects on the remaining financial entities. In order to assess contagion risk, monthly data related to risk exposures among domestic banks, brokerage firms, investment funds and siefores are used, as well as these intermediaries' exposures to foreign entities.

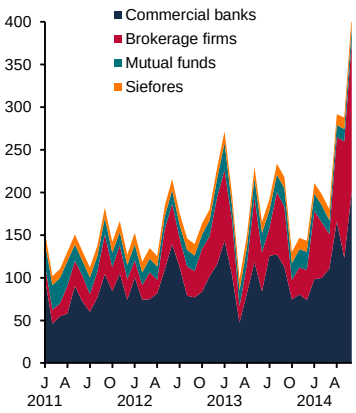
Graph 34
Direct Contagion Indicators

a) Percentage of commercial banks' assets whose capital would be affected in case the worst chain of contagion was triggered



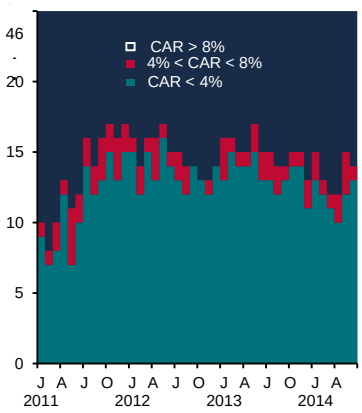
Figures as of June 2014
Source: Banco de México

c) Commercial banks' maximum losses in case the worst chain of contagion was triggered



Figures as of June 2014
Source: Banco de México

c) Number of banks and their corresponding capital levels in case the worst chain of contagion was triggered



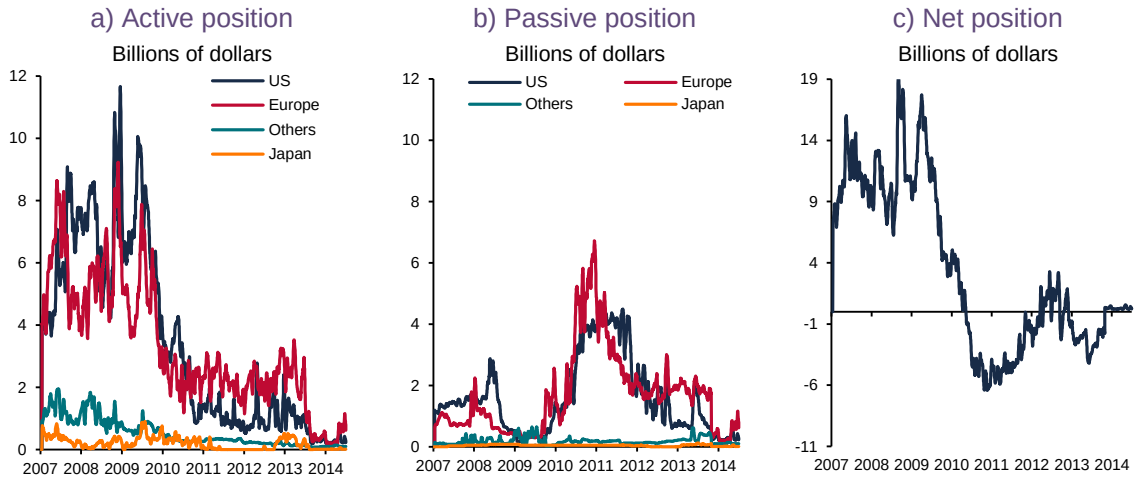
Figures as of June 2014
Source:: Banco de México

Contagion risk, in terms of the number of institutions hit in the event of the worst chain of contagion, had been declining since June 2013. Nevertheless, both the amount of losses and assets affected spiked over the last year (graph 34).

[11] The risk analysis presented in this *Report* is similar to those performed in previous years' reports. In particular, we used the same methodology described in the 2006 *Financial System Report* published in May 2007, but included domestic brokerage firms, mutual funds and siefores, as well as foreign financial intermediaries. The worst possible chain of contagion was considered for each date during the period of analysis. The worst possible contagion chain is that which generates the largest impact on the system. Additionally, impact was measured using the sum of assets owned by banks and brokerage firms with a capital adequacy ratio below 8 percent and a capital consumption ratio of above 100 percent, respectively. As explained below, direct exposures in the Mexican financial system to some countries' sovereign debt were also included; yet, they proved to be unimportant over the time horizon analyzed. The foreign financial institutions considered in this analysis are those to which financial intermediaries have the largest exposure.

The higher level of possible losses can be explained by greater network interconnectedness. Moreover, the increased amount of assets owned by institutions hit by contagion is attributable to the fact that some banks which are part of the chains have seen their share in total system's assets rise; in other words, assets owned by some of the banks that would be part of contagion chains grew at a higher rate than the rest in the system. In addition, direct exposures to foreign financial intermediaries have constantly gone down since 2007. Henceforth, risk of foreign direct contagion has considerably diminished (graph 35).

Graph 35
Direct Risk Position with Foreign Financial Intermediaries[1/]



Figures as of June 2014
Source: Banco de México

Figures as of June 2014
Source: Banco de México

Figures as of June 2014
Source: Banco de México

1/ Exposure is defined as the aggregate net creditor position of deposits, loans, securities holdings, the positive net valuation of derivatives contracts and the net creditor position of guarantees, repos, securities loans and value date transactions.

Table 2 shows domestic financial intermediaries' exposures to foreign entities. Commercial banks were the intermediaries with largest exposures to foreign entities, followed by siefores. Exposures to financial intermediaries based in the US were the most substantive, followed by exposures to Latin American intermediaries.

Table 2
Exposures of Mexican Financial Intermediaries to Foreign Entities[1/]

Billions of pesos

Creditor/Debtor	US	Europe		Latin America	Other	Total
		Spain	Other			
Commercial banks	25.8	4.7	10.7	31.0	0.1	**72.4**
Development banks	4.7	0.0	2.6	0.3	0.0	**7.6**
Brokerage firms	1.0	0.0	0.5	0.9	0.0	**2.4**
Mutual funds	4.5	2.3	1.0	1.9	0.0	**9.7**
Siefores	18.4	0.8	1.6	0.0	0.0	**20.7**
Total	**54.4**	**7.8**	**16.4**	**34.2**	**0.1**	**112.8**

Figures as of June 2014
Source: Banco de México
1/ Exposure is defined as the aggregate net creditor position of deposits, loans, securities holdings, the positive net valuation of derivatives contracts and the net creditor position of guarantees, repos, securities loans and value date transactions.

2.7 Financial Position of Households, Firms and the Public Sector

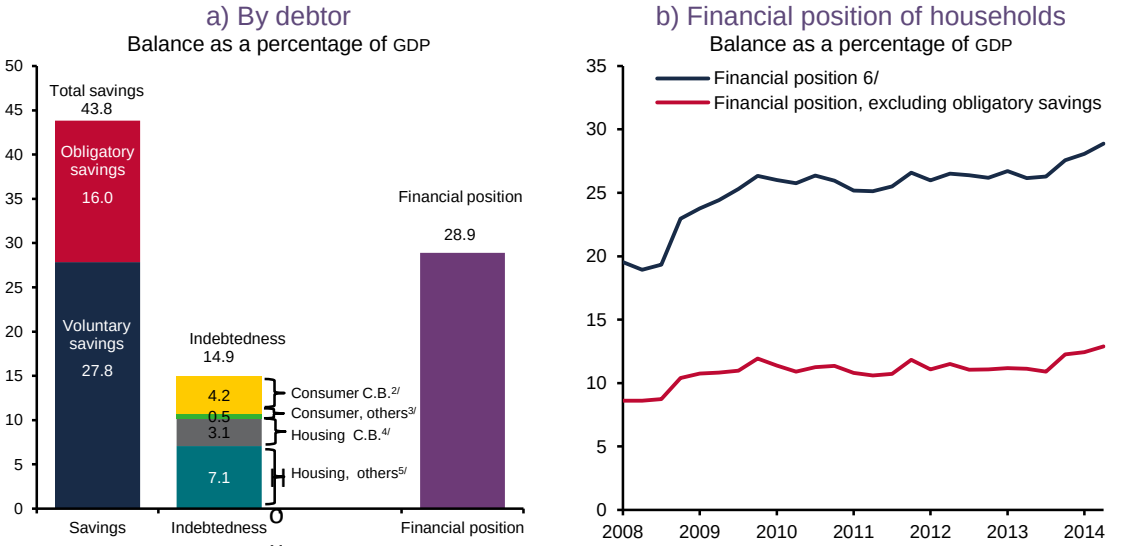
At the end of the second quarter of 2014, the financial position of households grew stronger compared with the same period of previous year, owing to an increase in financial asset holdings above the growth in indebtedness registered during the year. Besides, public and non-financial private companies' indebtedness continued to grow. With regard to the former, as a result of favorable conditions conducive to the placement of debt in international markets; with regard to the latter, as a consequence of the countercyclical fiscal policy implemented in recent years.

Households and Firms

As of June 2014, the financial position of households[12] amounted to 28.9 percent of GDP; this figure was 2.7 percentage points higher compared with the previous year (graph 36). The increase resulted from higher financial asset holdings, particularly during the second quarter of 2014 –this was due to an increase in the value of securities that are part of the pension fund portfolio, caused by the fall in interest rates registered during the same period. For its part, household indebtedness continued to grow during the first half of 2014 at a similar rate to that observed in 2013. As of June 2014, it reached the level of 14.9 percent of GDP, which represented a slight increase *vis-à-vis* the 14.4 percent registered at the end of the same period of previous year (figure 2).

[12] The financial position of households is defined as the difference between their asset holdings included in the monetary aggregate M2 and their debt vis-à-vis the financial system.

Graph 36
Financial Position of Households[1/]

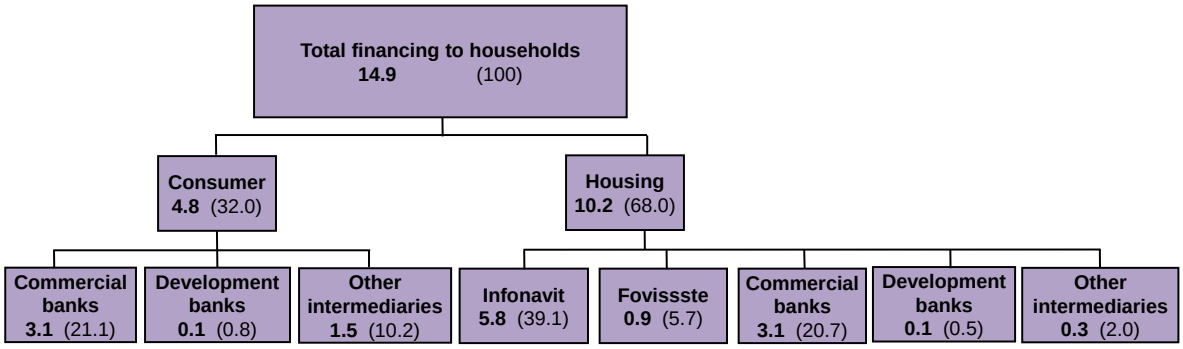


Figures as of June 2014
Source: Banco de México

Figures as of June 2014
Source Banco de México

1/ Due to rounding, the sum of the parts may not coincide with the total. Figures in percentages of nominal average GDP during last four quarters.
2/ Includes loans granted by commercial banks and their regulated subsidiary sofomes.
3/ Includes loans granted by development banks, sofoles and popular savings and credit entities.
4/ Includes loans granted by commercial banks.
5/ Includes loans granted by development banks, sofoles, regulated sofomes, Infonavit and Fovissste.
6/ Financial assets (M2 households) minus financial liabilities (indebtedness with the financial system).

Figure 2
Total Financing to Households[1/ 2/ 3/]
Percentage of GDP (percentage structure)

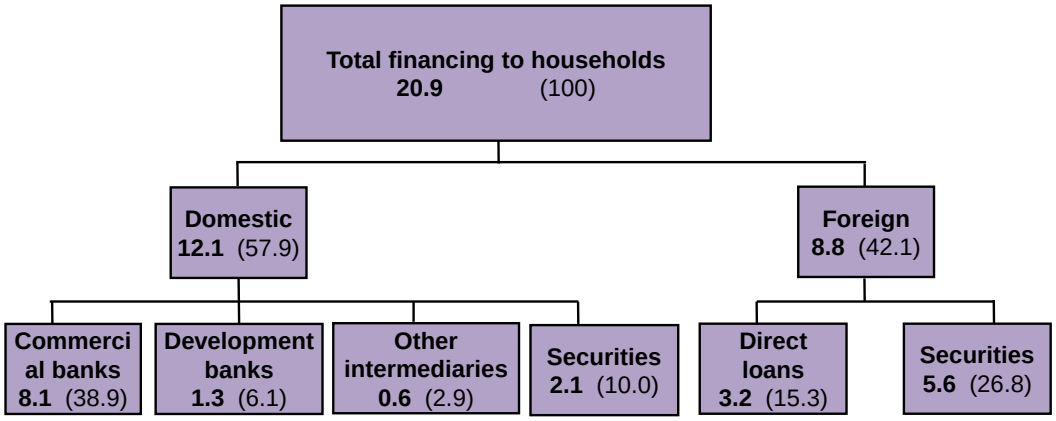


Figures as of June 2014
Source: Banco de México
1/ Due to rounding, the sum of the parts may not coincide with the total.
2/ The "Commercial banks" heading does not include regulated subsidiary sofomes, as they are included in "Other intermediaries".
3/ "Other intermediaries" includes regulated sofomes, socaps and sofipos.

In the second quarter of 2014, household debt service accounted for 2.9 percent of disposable household income, registering no change *vis-à-vis* the level observed in June 2013.[13] This was a result of a moderate increase in indebtedness and a decline in interest rates.

As far as non-financial private companies are concerned, total financing granted to that sector accounted for 20.9 percent of GDP at the end of the second quarter of 2014 (graph 22), registering an annual growth rate of 11.7 percent in real terms (figure 3).

Figure 3
Total Financing to Non-Financial Private Companies[1/ 2/ 3/ 4/ 5/]
Origin of Funds
Percentage of GDP (percentage structure)



Figures as of June 2014
Source: Banco de México
1/ Due to rounding, the sum of the parts may not coincide with the total.
2/ "Securities" corresponds to domestic financing received by non-financial companies through issuances of debt securities.
3/ The "Commercial banks" heading does not include regulated subsidiary sofomes, as they are included in "Other intermediaries".
4/ The "Development banks" heading also includes development funds.
5/ External financing includes credit granted by foreign commercial banks, suppliers and other creditors, as well as debt instruments placed abroad. Data on foreign suppliers is obtained from issuing companies' balances listed on the Mexican Stock Exchange (BMV).

This expansion was driven by the issuance of debt abroad. Simultaneously, foreign financing registered annual growth of 22.3 percent in real terms, in sharp contrast with the growth rate registered during the same period in 2013 (6.2 percent).

[13] Even though the aggregate debt service-to-income ratio is considerably lower than that of other countries, figures for certain population segments could be substantially higher.

Domestic corporate financing registered annual growth of 5.1 percent in real terms, as a result of the mixed performance of its components. On one hand, as of the second quarter of 2014, commercial banks' loans to private companies outperformed last year's level (3.6 percent), recording a real annual growth rate of 4.6 percent. On the other hand, during that quarter, debt placements in the domestic market shrank by 1.9 percent in real annual terms, as opposed to the 6.6 percent growth rate registered in the same period of 2013.

Public Sector

At the end of 2013, the public sector deficit was 374.2 billion pesos (2.3 percent of GDP) –the deficit was only 45.7 billion pesos (0.3 percent of GDP) when excluding physical investment in Pemex. In both cases, the amounts were lower than the corresponding levels of 2012; regarding the annual budgetary target, the actual economic deficit in 2013 was lower than the authorized target for the same year.

The Economic Policy General Criteria (CGPE in Spanish) for 2015 envisioned that public budgetary targets would be met in 2014: a deficit of 620.4 billion pesos (3.6 percent of GDP) and 262.9 billion pesos (1.5 percent of GDP) when excluding Pemex investment. According to said criteria, the broadening of the public sector deficit in 2014, together with higher budgetary income derived from the Fiscal Reform, would allow an expansion of public expenditure of approximately 3.1 percent in real terms *vis-à-vis* actual expenditure in 2013. At the end of the second quarter of 2014, the balance of stabilization funds was 99.0 billion pesos, 27.9 billion higher with regard to the end of 2013. This balance represents 47.5 percent of the level reached at the end of 2008.

The Federal Revenue Law (LIF in Spanish) approved for 2015 anticipates a level of budgetary income 1.9 percent higher in real terms *vis-à-vis* the level proposed for 2014. Such revenue already considers amendments made by the legislative power to the macroeconomic framework originally put forth in the CGPE 2015.[14] Additionally, the LIF for 2015 puts forth a public deficit of 641.5 billion pesos (3.5 percent of GDP) and 183.6 billion pesos (1.0 percent of GDP) when not taking into account Pemex's and the Federal Electricity Commission's investment, as well as high-impact projects.[15] This would allow growth of 1.3 percent in public expenditure for 2015, compared with the level estimated by the SHCP for the 2014 year-end.

[14] The price for the Mexican oil mix decreased from 82.0 to 79.0 dollars per barrel and the exchange rate came from 13.0 up to 13.4 pesos per dollar.

[15] The deficit excluding Pemex investment amounts to 275.2 billion pesos (1.5 percent of GDP).

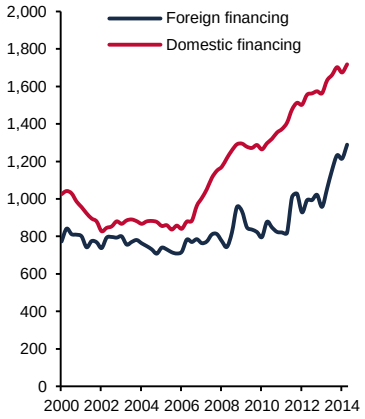
2.8 Private Sector Indebtedness

Low interest rates in developed countries, as well as ample international liquidity, have enabled companies from emerging countries to issue debt in in international markets under highly favorable circumstances. As of June 2014, 42.1 percent of funds received by Mexican non-financial private companies were foreign, and 63.0 percent thereof corresponded to securities issuances. Over the last six years, 49 Mexican companies have issued bonds abroad for nearly 76 billion dollars; just in 2013, bond placements amounted to approximately 18 billion dollars, a record high in Mexican financial history (graph 37).

Graph 37
Total Financing to Non-Financial Private Companies

a) Total financing[1/]

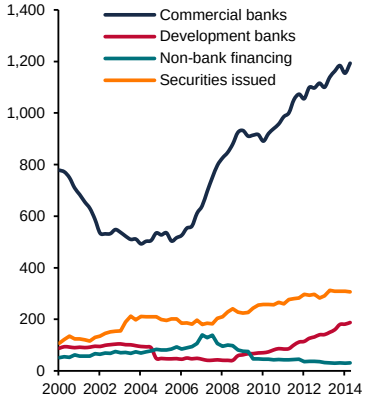
Billions of constant 2010 pesos



Figures as of June 2014
Source: Banco de México

b) Domestic financing

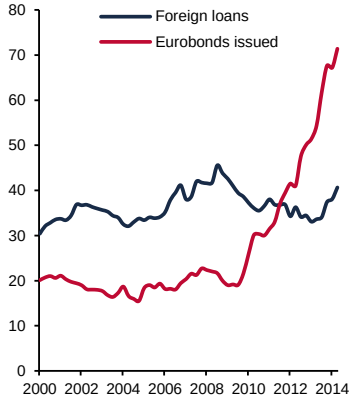
Billions of constant 2010 pesos



Figures as of June 2014
Source: Banco de México

c) Foreign financing

Billions of dollars



Figures as of June 2014
Source: Banco de México

1/ Foreign financing to Mexican companies includes loans granted by foreign commercial banks, suppliers, other foreign creditors and securities issued abroad. Domestic financing includes loans granted by commercial and development banks, as well as non-bank intermediaries such as sofomes, socaps, sofipos, credit unions and debt issued in the domestic market

Conditions in international markets have been favorable for companies with lower credit ratings, who have been able to tap funds via the placement of bonds (graph 38a). A number of companies issuing debt abroad have reported that funds obtained will be used to refinance debt thanks to the more suitable conditions granted. Others report that funds will be used as working capital. There is nonetheless a not inconsiderable number of companies that have not reported how they will use funds obtained via the issuance of debt.

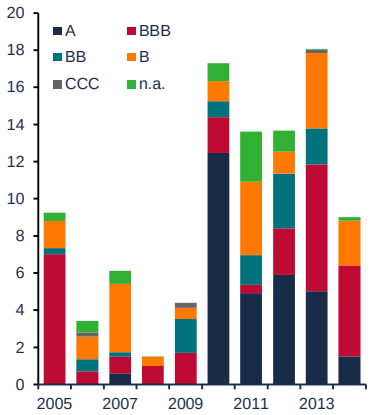
The majority of issues placed abroad by local companies have a fixed rate (graph 38b); consequently, companies have not incurred

the risk related to global interest rate hikes. Terms for these issuances have been long, and they have scarcely been redeemed in the short- and medium-term (graph 38c).

Graph 38
Mexican Companies' Debt Placements Overseas

a) By initial credit rating

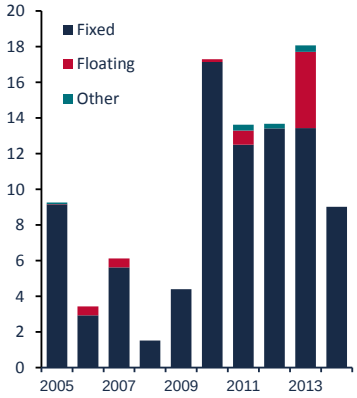
Billions of dollars



Figures as of October 20, 2014
Source: Bloomberg

b) By type of coupon

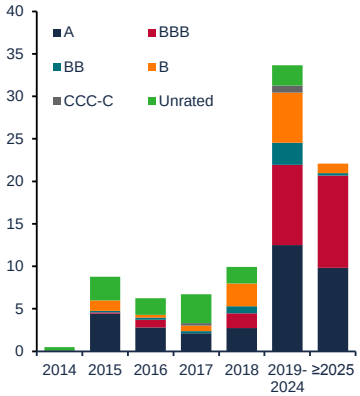
Billions of dollars



Figures as of October 20, 2014
Source: Bloomberg

c) By maturity date and current rating

Billions of dollars



Figures as of October 20, 2014
Source: Bloomberg

Nonetheless, debt placements overseas expose issuing companies to other risks, such as leveraging and exchange rate risks. The latter occurs when the corresponding debt service is not adequately covered with assets or revenues denominated in the respective currency. Although there are no public data about all companies issuing debt overseas that enable the accurate analysis of risks assumed, there is information about companies listed on the BMV, which publish their financial statements every quarter.[16] Since these companies have issued nearly 88.0 percent of the total amount of bonds placed abroad, the aforementioned risks can at least be partially assessed.

Based on this public information, we estimated the mortgage losses that these companies might suffer, *ceteris paribus*, in the event of a 30.0 percent exchange rate depreciation. For that purpose, these companies' net position in foreign currencies was considered as the

[16] In conformity with the US Securities and Exchange Commission's Rule 144A and Regulation S, most placements of corporate bonds overseas are private. Said rule provides the possibility of exempting foreign securities from registration (with the ensuing release from obligation to disclose periodical financial information), provided the corresponding securities can be placed privately and exclusively acquired by rated and institutional investors.

source of exchange-rate risk (liabilities minus assets denominated in foreign currencies).

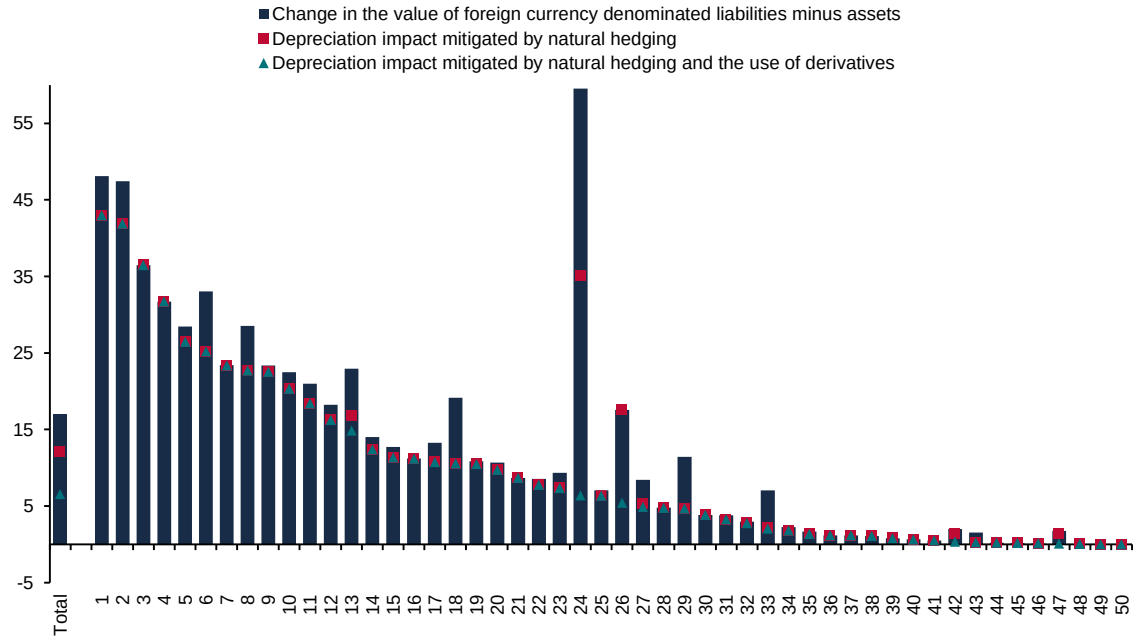
Further, the effect of depreciation as an exchange-rate risk mitigator on companies' net revenues denominated in foreign currencies was evaluated too –this is known as natural hedging. We also estimated the currency hedging derived from derivatives transactions reported by companies. Companies that do not disclose information about their derivative hedging, or do not provide that information in full detail, did not exhibit a decline in exchange-rate risk.[17]

Results showed that, at an aggregate level, losses would be limited and equivalent to slightly more than 15.0 percent of unhedged equity and 5.0 percent of hedged equity (graph 39). This can be partially explained by the fact that companies may have learnt to be more prudent when managing such risk. For example, transactions with currency options, which were a major source of instability during the global financial crisis, have significantly dropped (graph 40). Nevertheless, the analysis of exchange-rate risk at the company level suggests that some of them might incur substantial losses in the event of a significant exchange rate depreciation (graph 39).

On the other hand, the higher foreign financing received by issuing companies, mostly large corporations, has favored an increase in said companies' leveraging in recent years (graph 41b). These companies' financing needs may be considerable in the future, with no trace of accumulation of cash or other liquid assets (graph 41c). As developed countries' monetary policies revert to normal, especially in the years where maturities of issuances are concentrated, such companies may be driven to demand more local bank loans.

[17] Importantly, the quality of data about positions with derivative instruments disclosed by companies quoted on the BMV is heterogeneous. Some companies publish data with a level of detail that allows identification of the notional value, the aim of the transaction (hedging or speculation), the risk covered, the instrument used, the counterparties' credit rating, etc. Furthermore, in some cases, the use of non-linear derivative instruments for hedging purposes, such as options, makes it difficult to accurately assess how effective the hedging strategy was; for instance, if a call spread is used to mitigate depreciation risk, said instrument covers up to certain percentage thereof, which may be insufficient in a high-depreciation scenario.

Graph 39
Impact of a 30 Percent Exchange Rate Depreciation on 50 Companies Quoted on the BMV[1/]
Percentage of equity



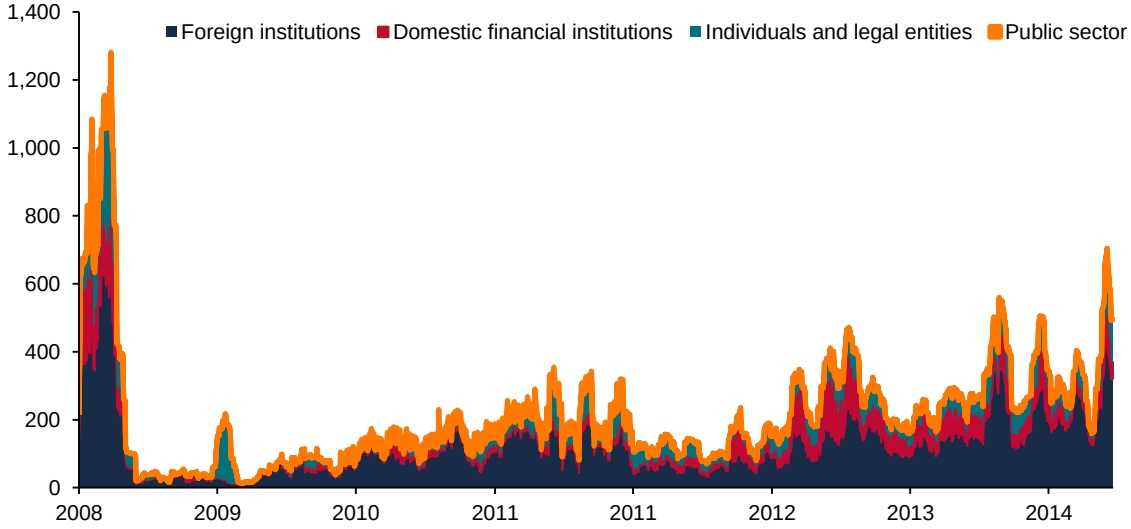
Figures as of June 2014
Source: BMV
1/ In order to assess Mexican companies' exchange rate risk, we performed a sensitivity test, given a 30.0 percent exchange rate depreciation. For that matter, only companies listed on the BMV with negative effects on their balances owing to exchange rate depreciation were considered; in other words, companies with more foreign currency denominated liabilities than assets (50 companies). The total was obtained adding measures used for this set of companies. Thus, blue bars show the change in the value of foreign currency denominated liabilities minus assets, given a 30 percent exchange rate depreciation. Red boxes show companies' loss mitigated by foreign currency denominated net income (natural hedging). Apart from natural hedging, green triangles include currency hedging as a mitigating factor, using derivatives reported by companies on their financial statements.

As a result, funds for large companies would become more expensive and smaller-sized companies would cease to be granted bank loans. This could be the case because large companies pose lower credit risk for banks and offer other business possibilities, as banks could provide them with additional services to obtain extra income –treasury, consulting, payroll, asset management services, etc. This would cripple the access that smaller companies have recently had to bank credit, while larger companies have been issuing debt overseas (graph 41a).

Last, exposure of issuing companies that have seen their bank leverage rise accounts for less than 6.7 percent of banks' net equity. Therefore, potential direct contagion, *ceteris paribus*, is limited.

Graph 40
Turnover for MXN/USD Options by Counterparty

Millions of dollars, 10-day moving average

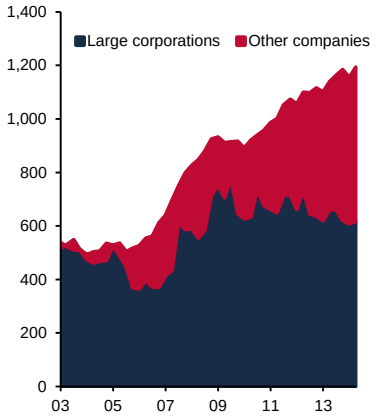


Figures as of October 20, 2014
Source: PIP

Graph 41
Bank Credit to Corporate Sector and Financial Ratios of Companies Listed on the BMV

a) Credit granted by commercial banks, by size of company[1/]

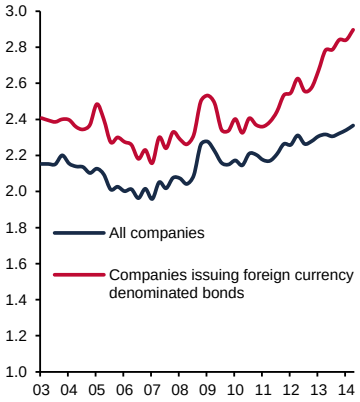
Billions of pesos



Figures as of June 2014
Source: Banco de México

b) Asset-To-Equity ratio of companies listed on the BMV

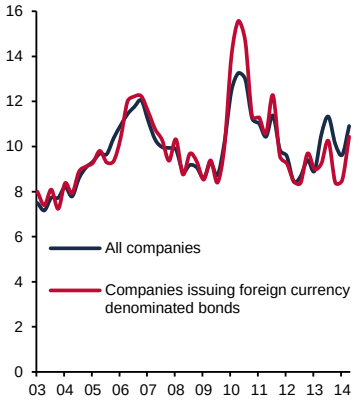
Times



Figures as of June 2014
Source:: BMV

c) Position in cash and other liquid assets of companies listed on the BMV[2/]

Percentage of total assets



Figures as of June 2014
Source:: BMV

1/. Large companies are listed firms which are part of the 500 largest companies in the country or having current loans for more than one billion pesos; the rest was classified as "other companies".
2/ Liquid assets include demand deposits and short-term securities investments.

3. Financial Intermediaries

3.1 Financial System Structure

As of the end of the first half of 2014, total assets in the financial system amounted to 14.3 billion pesos (85.3 percent of GDP); this implied a 6.1 percent annual increase in real terms with regard to the same period of the previous year. Popular savings and credit entities, regulated sofomes,[18] pension funds (siefores), development institutions (including development banks) and commercial banks were the financial intermediaries with higher annual growth rates. In contrast, assets of unregulated sofomes (those for which there are available data)[19], general deposit warehouses and brokerage firms displayed a reduction in real terms *vis-à-vis* the previous year (table 3).

The case of unregulated sofomes is particularly interesting, as recent financial reform shall substantially improve available information about borrowers' performance, as said entities will be obliged to report information to at least one credit information bureau. This information is expected to allow financial authorities and other intermediaries to analyze said entities' customers and risks. According to Condusef records in the Bureau of Financial Institutions,[20] the number of unregulated sofomes significantly increased *vis-à-vis* last year's figure. Yet, Condusef also estimates that approximately 16 percent thereof cannot be located.[21]

[18] A significant portion of said asset increase can be explained by Banco Santander's purchase of ING Hipotecaria (an unregulated sofom) in December 2013. This sofom became a regulated sofom named Santander Vivienda − thus, it entered a new category.

[19] Data available for the analysis of unregulated sofomes are incomplete and based on AMFE members' reports. These entities' assets are estimated using their loan portfolio. Between June 2013 and June 2014, there was a net exit of AMFE members. Based on available data, corporate loans granted by this group fell approximately 60 percent in real annual terms, whereas consumer credit grew around 24 percent.

[20] Condusef developed a register that contains information about financial entities, including unregulated institutions, such as unregulated sofomes. For the purpose of providing information to the general public, the register includes data about products offered by these entities, users' complaints, administrative sanctions, etc. With respect to registered unregulated sofomes, Condusef has attempted to physically locate a sample thereof; yet, it has sometimes been impossible to reach them using recorded data. Against this background, Condusef has issued a public warning about their unsafety for users.

[21] A financial entity is classified as unreachable when it does not comply with information requirements abiding by the rules issued by the Financial Service Providers Register.

Table 3
Number of Institutions and Market Share by Type of Intermediary in the Mexican Financial System

	Number of entities	Share in total assets (%)	Real annual growth rate of assets (%)	
			2014	2009-2012
Commercial banks[1/]	47	48.6	7.4	4.4
Siefores (afores)[2/]	77 (11)	16.5	11.8	14.2
Investment funds (managers)[3/]	605 (52)	12.6	5.3	11.9
Development institutions[4/]	10	9.9	7.4	3.0
Insurance companies	103	6.7	3.7	8.0
Surety Companies	15	0.1	2.4	4.4
Brokerage firms	35	2.6	-22.4	21.9
Regulated sofomes[5/]	27	0.5	4.9	11.6
Unregulated sofomes[6/]	4,014	1.2	-3.2	-21.2
Popular savings and credit entities[7/]	180	0.7	16.4	13.5
Credit unions	103	0.3	7.6	5.4
General deposit warehouses	19	0.1	-2.8	10.3
Financial leasing companies [8/]	*0*	*0.0*	*-100.0*	*-28.1*
Factoring companies [8/]	*0*	*0.0*	*-100.0*	*-25.7*
Sofoles [8/]	*0*	*0.0*	*-100.0*	*-26.4*
Memo: Housing institutes [9/] and others [10/]	*3*	*n.a.*	*n.a.*	*n.a.*

The number of financial entities refers to those authorized as of June 2014; some are not operating. Their share of total assets corresponds to June 2014 and the real growth rate refers to June 2014 with regard to the same month a year earlier. Source: Banco de México, SHCP, CNBV, CNSF, Consar, Condusef and AMFE

1/ The number of commercial banks refers to September 2014, when 44 banks were active, 3 had a license and were not active, and Banco Bicentenario had halted operations. Commercial banks' total assets include regulated sofomes that are consolidated with the respective bank in case they are subsidiaries.
2/ Overall, there are 11 pension funds (afores) which manage a total of 77 siefores.
3/ Investment fund management companies (52) manage 605 funds in all. Of the 52 investment fund operators, 4 are commercial banks, 10 are brokerage firms and 38 are investment fund management companies. Asset information stems from the balance sheets of investment funds, not management companies.
4/ Includes development banks and trusts; i.e., FIRA, FOVI, Fifomi and Financiera Nacional de Desarrollo Agropecuario, Rural, Forestal y Pesquero (National Funds for Farming, Rural, Forestry and Fisheries Development).
5/ Total asset share considers sofomes that are regulated because they belong to a financial group but do not consolidate their assets with a commercial bank (20 out of 27). Those that do consolidate their assets with banks are included in the commercial banking heading (7 out of 27).
6/ Figures referring to the number of unregulated sofomes stem from a Condusef record thereof. However, information about assets only contains data from entities affiliated to the AMFE, a sector trade association which to date has 36 unregulated members.
7/ Includes savings and loan associations (SLA), popular finance corporations (sofipos), savings and loan cooperatives (socaps). It does not include Tier 1 savings and loan associations at the licensing stage (extension of period).
8/ Sofoles, surety and factoring companies are no longer legally instituted as of July 2013.
9/ Infonavit and Fovissste
10/ Infonacot

On the other hand, the popular savings and loan sector, made up of popular finance corporations (sofipos) and savings and loan cooperatives (socaps), grew at a higher rate *vis-à-vis* the rest of intermediaries.[22] Such growth rate can partly be attributed to the end of the regularization process that the sector underwent since March 2014 and which gave way to an increased number of registered entities.

Over the last year, the banking system corporate structure changed substantially. Firstly, Mexican investors purchased two subsidiary banks of foreign financial entities.[23] In addition, four specialized or niche banks[24] were authorized, although only two have started operations and are run by domestic individuals.[25] Finally, Banco Bicentenario's operating license, a niche bank, was revoked.

Indeed, the financial system structure has undergone relevant changes, namely, an increase in the number of banks and a fall in the share of foreign entities, especially in the afore and brokerage firm headings (table 4).

[22] Additionally, there is a single financial community partnership (sofico) in the sector, which was authorized in June 2013 as the first entity of its kind. Popular savings and loan entities are authorized by the CNBV and supervised by both the aforementioned institution and the federations these entities are affiliated to. Further, they all have their own protection funds. Socaps authorized and supervised by the CNBV have insurance that covers their partners' savings up to a certain amount.

[23] During the first half of 2014, the Bank of New York Mellon was acquired by CI Bank, whereas the Royal Bank of Scotland was acquired by Investa, a non-financial controlling company; the bank changed its name to Investa Bank.

[24] Activities and services authorized for commercial banks are specified in article 46 of the Law of Credit Institutions. The category of specialized or niche banks was included in secondary regulation in 2009. The operations that these banks are allowed to undertake must be specified in their articles of association. For that purpose, it was established that the minimum paid-in capital that niche banks must have shall be lower than the minimum required for commercial banks.

[25] Banco Progreso de Chihuahua resulted from the merger of three institutions that belong to the same group: the Progreso Credit Union, the Akala sofipo and Única Brokerage Firm; Banco Finterra resulted from the transformation into a bank of a sofom bearing the same name. Additionally, in September 2012, Banco Pagatodo was authorized to grant payment services.

Table 4
Financial System Corporate Structure

	Commercial banks		Afores		Insurance companies		Brokerage firms	
	Number	(%) assets1/	Number	(%) assets1/	Number	(%) assets1/	Number	(%) assets1/
I. Affiliates of foreign financial entities	**13**	**70.3**	**4**	**32.5**	**58**	**62.5**	**15**	**12.2**
a. belonging to a financial group (FG)	10	65.7	1	9.8	10	24.8	9	8.9
b. not belonging to a FG	3	4.7	3	22.7	48	37.6	6	3.3
II. Controlled by local individuals	**24**	**25.0**	**3**	**47.8**	**21**	**31.3**	**16**	**73.4**
a. belonging to a financial group (FG)	8	21.7	2	44.8	9	18.8	5	34.7
b. not belonging to a FG	16	3.3	1	2.9	12	12.5	11	38.7
III. Controlled by non-financial entitties	**10**	**4.7**	**4**	**19.7**	**24**	**6.2**	**4**	**14.4**
a. belonging to a financial group (FG)	3	2.3	0	0.0	0	0.0	3	14.3
b. not belonging to a FG	7	2.4	4	19.7	24	6.2	1	0.1
Total	**47**	**100**	**11**	**100**	**103**	**100**	**35**	**100**

Figures as of June 2014
Source: Banco de México, CNBV, CNSF y Consar
1/ Market share measured as every intermediary's percentage of total assets.

During the first half of 2014, some intermediaries' profitability was slightly lower than in 2013, whereas it was considerably higher for others. Importantly, for most private intermediaries, return on equity was higher than for companies quoted on the BMV (table 5).

Table 5
Profitability of Financial Intermediaries and Non-Financial Firms Quoted on the Mexican Stock Exchange (BMV)[1/]

Sector	Return on equity (Net profit as a percentage of equity)		
	2010	2013	jun-14
Commercial banks	13.4	15.4	13.3
Pension Funds[2/]	26.6	15.8	18.4
Mutual fund managers[3/]	29.9	43.5	61.3
Development institutions[4/]	6.6	4.0	5.8
Insurance companies	15.0	16.6	9.8
Surety companies	18.5	15.0	35.1
Brokerage firms	20.7	22.3	20.4
Regulated sofomes[5/]	10.0	13.2	10.6
Unregulated sofomes	-0.9	n.d.	n.d.
Popular savings and credit entities[6/]	6.7	6.6	7.9
Credit unions	6.8	6.2	6.4
General deposit warehouses	6.2	19.7	2.2
BMV companies	14.2	13.0	8.6

Source: CNBV, Consar, BMV, CNSF and AMFE
1/ Return on equity was calculated using the accumulated result of twelve previous months, and then dividing them by average equity during that period. Commercial banks' profitability was boosted by extraordinary revenues derived from the sale of business units during the first quarter of the year.
2/ Asset and capital figures correspond to the sum of pension funds´ balance sheets respective data, and not to funds managed by siefores. Aside from workers' funds, funds managed by siefores also include part of afores' capital, which under current capitalization rules must be invested in siefores.
3/ These figures refer to investment fund management companies rather than the funds in which they invest.
4/ Includes development banks and trusts; i.e., FIRA, FOVI, Fifomi and Financiera Nacional de Desarrollo Agropecuario, Rural, Forestal y Pesquero (National Funds for Farming, Rural, Forestry and Fisheries Development).
5/ Sofomes that are regulated because they belong to a financial group but do not consolidate their assets with a commercial bank.
6/ Includes savings and loan associations, popular finance corporations (sofipos) and savings and loan cooperatives (socaps).

3.2 Commercial Banks

Evolution and Performance

Commercial banks' assets totaled 7.1 billion pesos as of September 2014, which is equivalent to a real annual growth of 7.4 percent. Securities investments and derivative transactions were the components with the highest growth rates. Moreover, the loan portfolio grew at a lower rate than total assets.

The economic deceleration observed in the second half of 2013 and the first half of 2014 had an impact on credit demand; yet, banking activity picked up steam in the second quarter of 2014.

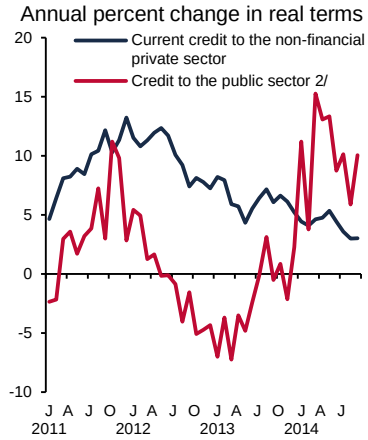
As a result, as of September 2014, current commercial bank loans to the non-financial private sector registered an annual growth rate of 3 percent in real terms, compared with the same month of previous year. In contrast, commercial bank loans to the public sector

registered a dramatic upturn (graph 42a). This type of financing currently accounts for 31 percent of total bank assets.

Housing credit exhibited the highest growth as of September 2014. In sharp contrast, consumer credit recorded a substantial deceleration, mainly driven by the credit card component, and to a lower extent, by personal and payroll loans.[26] Furthermore, bank loans to non-financial private companies grew at a lower rate than the average of the past five years (graph 42b), owing to the higher level of debt placed abroad by large Mexican companies. Over the period covered by this Report, the composition of companies resorting to local commercial banks continued to change, both in terms of their size and inherent credit risk. Hence, as of June 2014, the balance of bank loans to large companies dropped 8.8 percent in real terms compared with the same month of previous year, whereas loans to small-sized companies soared by 16.2 percent in real terms.

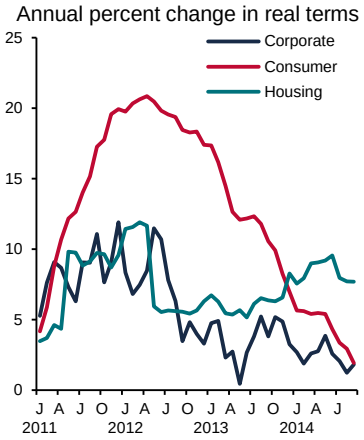
Graph 42
Commercial Bank Loans[1/]

a) Current loans to the non-financial private sector and public sector



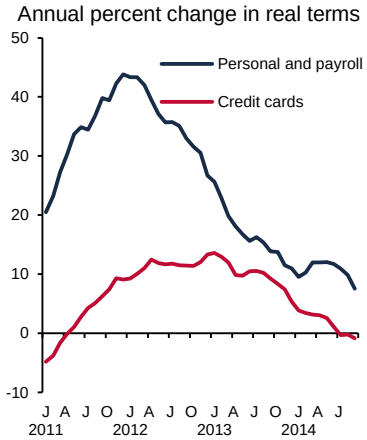
Figures as of September 2014
Source: CNBV

b) Current credit to the non-financial private sector by type of loan



Figures as of September 2014
Source: CNBV

c) Current consumer credit by type of loan



Figures as of September 2014
Source: CNBV

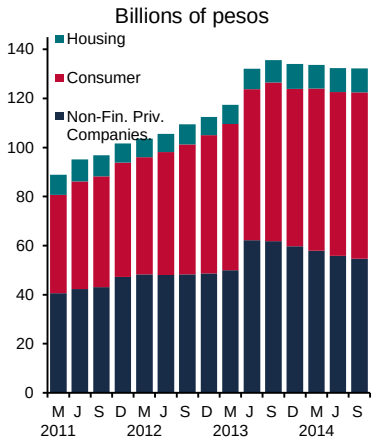
1/ Commercial bank loans include regulated sofomes that are consolidated with the respective bank provided they are subsidiaries. As of June 2014, these sofomes were Tarjetas Banamex, Servicios F. Soriana, Santander Consumo (Consumer), Santander Vivienda (Housing), Santander Hipotecario (Mortgages), Banorte-Ixe Tarjetas (Credit Cards), and CF Credit. It also includes loans granted to foreign entities and excludes loans granted by banks to their employees.
2/ Includes financing via investments in securities.

[26] The share of these two components in the consumer loan portfolio is currently very similar: as of September 2014, 43.6 percent for credit cards and 41.5 percent for personal and payroll loans.

Between September 2013 and September 2014, and after the sizable upturn observed in June 2013, there was a moderate decline in loan loss provisions (reserves). This resulted from a deterioration in the private sector commercial loan portfolio; and second, from amendments to the rating methodology applicable to such portfolio, which had a direct impact on required levels. In addition, during the same period, acquittances and write-offs amounted to 99.3 billion pesos.[27] Moreover, due to an increase in the non-performing bank loan portfolio to construction companies, there was a fall in both the total and corporate coverage ratio (graph 43).

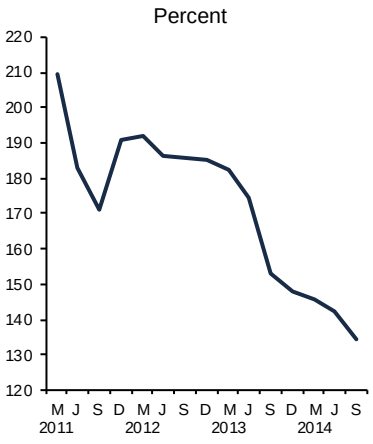
Graph 43
Commercial Bank Loan-Loss Provisions and Coverage Ratio

a) Loan-loss estimates[1/]



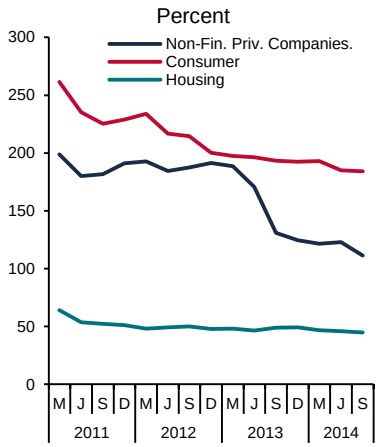
Figures as of September 2014
Source: CNBV

b) Coverage ratio[2/]



Figures as of September 2014
Source: CNBV

c) Coverage ratio by type of loan portfolio[2/]



Figures as of September 2014
Source: CNBV

1/ Refers to general loan-loss provisions and does not include provisions resulting from other factors.
2/ The coverage ratio is the balance of loan-loss provisions as a percentage of non-performing loans.

Profitability

Commercial banks' profitability experienced a moderate improvement during the first half of the current year *vis-à-vis* the same period of previous year, provided we disregard the extraordinary income generated in 2013.[28]

[27] The consumer portfolio accumulated the highest level of write-offs, mainly driven by credit card, personal and payroll loans. As of September 2014, these portfolios accumulated acquittances and write-offs for approximately 70.1 billion pesos.

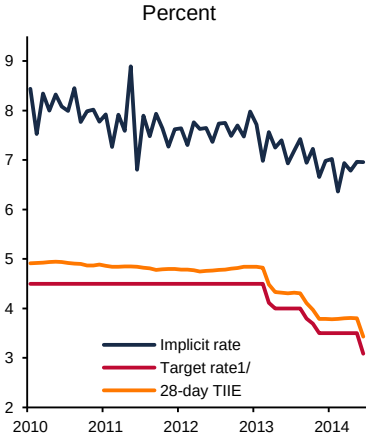
[28] The annual growth of net profits during the first half of 2013 was affected by extraordinary income received by a financial group that sold itspension fund.

Commercial banks' income stemming from lending activities was hit by both the decline in interest rates and the economic deceleration that took place in the second half of 2013 and early 2014. Whereas the economic deceleration shrank the credit demand, the fall in reference rates had an impact on commercial lending rates, as witnessed by the financial margin growth slowdown –as of September 2014, it was below last five years' average (1.4 percent in real annual terms).

Due to the portfolio composition, the drop in reference rates has not fully affected commercial banks' interest income. While the implicit rate for variable rate loans (i.e., the commercial loan portfolio, and to a lesser extent, the consumer loan portfolio) has decreased (graphs 44a and b), the decline in reference rates of other portfolios (e.g. the mortgage and personal loan portfolios) will take more time to materialize, since rates are fixed during contract validity. Nevertheless, marginal rates for the mortgage portfolio already show a decline related to the fall in reference rates and other factors, such as increasing competition among banks seeking to expand their market share (graph 44c).

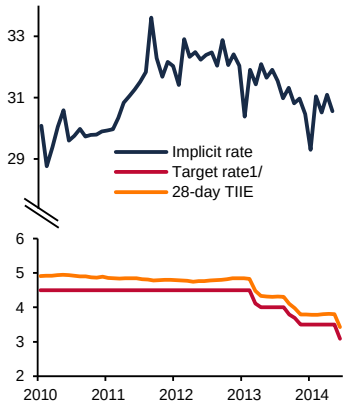
Graph 44
Performance of Rates for Commercial Bank Loans and Banco de México's Target Rate

a) Implicit rates for corporate loans



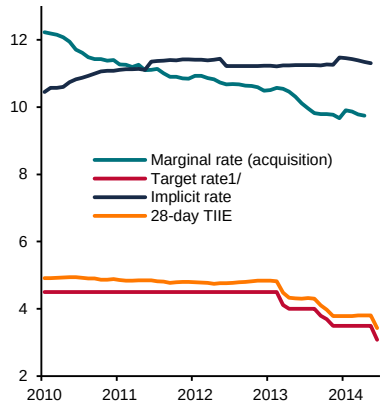
Figures as of June 2014
Source: CNBV and Banco de México
1/ Banco de México's target rate.

b) Implicit rates for consumer loans



Figures as of June 2014
Source: CNBV and Banco de México

c) Marginal and implicit rates for housing loans



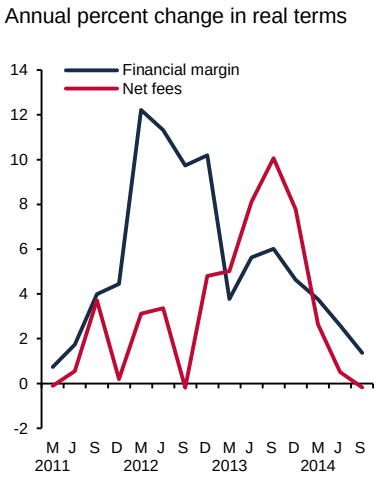
Figures as of June 2014
Source: CNBV and Banco de México

On the side of expenditures, administrative expenses continued to fall (graph 45), whereas as of June 2013, loan loss estimates increased significantly owing to changes in the rating methodology for the corporate portfolio –banks were obliged to build up additional loan loss provisions in order to comply with the new regulation. This

had a particular effect on certain banks that, before the entry into force of the new methodology, were faced with the deterioration of house building companies' loan portfolio.[29] Moreover, loan reserves increased due to a serious fraud suffered by a bank, which drove the non-performing portfolio up.

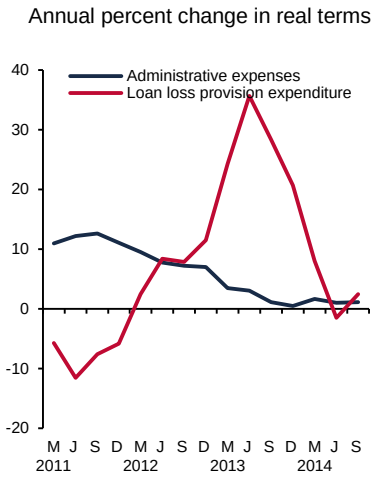
Graph 45
Commercial Banks' Sources of Income and Expenses

a) Income



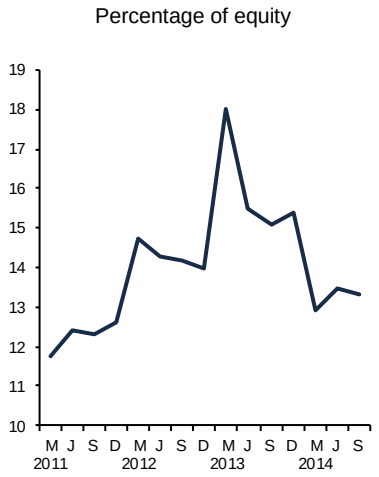
Figures as of September 2014
Source: CNBV

b) Expenses



Figures as of September 2014
Source: CNBV

c) Net profit



Figures as of September 2014
Source: CNBV

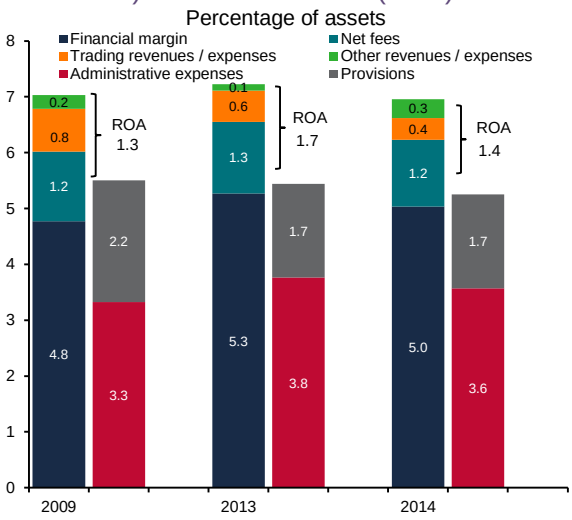
Commercial banks' income, expenditure and profitability compositions display significant differences depending on the type of institution (graph 46b). Importantly, niche banks have high administrative expenses that have not been matched by income.

Niche banks' profitability and delinquency indicators for the last year, together with the average of the past five years, demonstrate that, compared with other banks groups, niche banks' business is not consolidated yet (graph 47). The financial situation of several niche banks is potentially vulnerable, due to their limited balance diversification, as well as difficulties to stabilize a deposit base and comply with prudential regulation.

[29] On July 24, 2013, the new rating methodology for commercial loan loss provisions based on expected losses was published in the Official Gazette of the Federation (DOF in Spanish). The temporary rating regime for the commercial loan portfolio put forth that, in order to rate and provide commercial loans to legal entities and individuals with entrepreneurial activities, financial institutions had to embrace the new methodology before December 31, 2013. This meant they must have built up 100% of the mandatory reserves prescribed by the new methodology. As far as commercial loans to financial entities are concerned, the expected loss approach came into force as of January 1, 2014; accordingly, institutions must have built up 100% of mandatory reserves on June 30, 2014 at the latest. Nevertheless, a number of banks had already made the corresponding accounting adjustments by late June 2013.

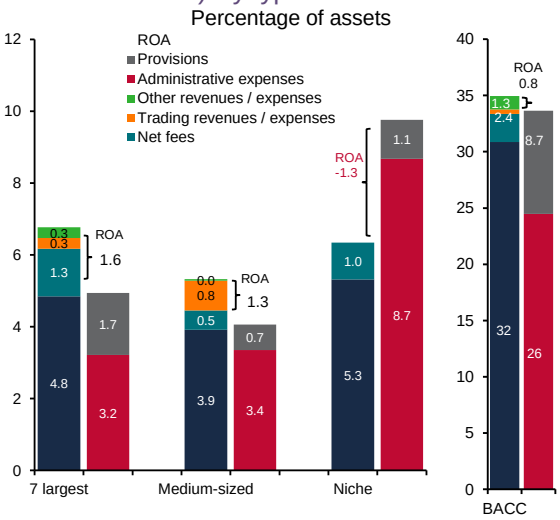
Graph 46
Performance of Commercial Banks' Profitability: Total and by Type of Bank

a) Commercial banks (Total)



Figures as of September 2014
Source: CNBV
BACCS: Banks associated to commercial chains

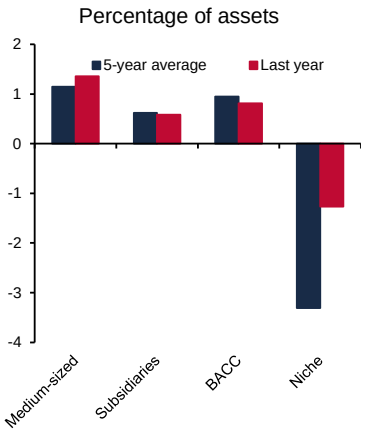
b) By type of bank



Figures as of September 2014
Source: CNBV

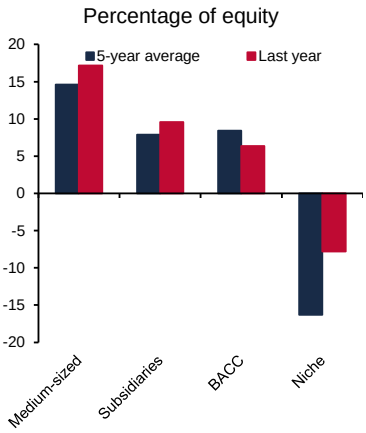
Graph 47
Performance Indicators by Bank Groups

a) Return on Assets (ROA)



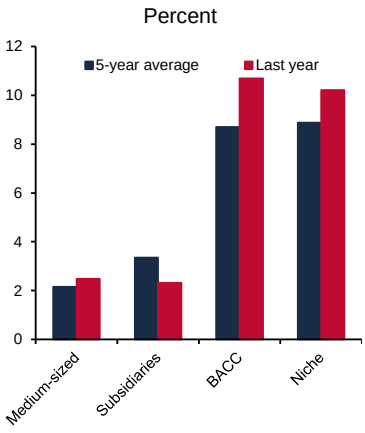
Figures as of September 2014
Source: CNBV
BACCS: Banks associated to commercial chains.

b) Return on Equity (ROE)



Figures as of September 2014
Source: CNBV

c) Delinquency rate for total portfolio



Figures as of September 2014
Source: CNBV

Solvency

The capital adequacy ratio for the entire banking system came down from 16 percent in August 2013 to 15.8 percent a year later. The decrease in such level was caused by a higher nominal rise in RWA (7.5 percent) than in net capital (6 percent) (graph 48a).

Additionally, the banking system capital fell temporarily during the last quarter of 2013 due to advance dividend payments made by various banks before the entry into force of the tax reform approved by Congress. Hence, the decline in capital adequacy ratios was partially reversed during the first half of 2014. These changes translated into a reduction in Common Equity Tier 1 by late December, and later, into a subsequent upturn, albeit not in the same proportion. The remaining capital components did not present relevant changes (graph 48b). Furthermore, some middle-sized banks are no longer in the comfortable financial position they enjoyed one year ago. Therefore, they will have to raise capital if they want to increase their assets at the same pace as in recent years.

Banco Bicentenario's solvency –a recently founded institution, licensed to operate as a limited scope or niche bank− was affected in recent months. Its capital adequacy ratio fell below the required minimum (4.5 percent of RWA). Consequently, the authorities revoked its license and started its liquidation.

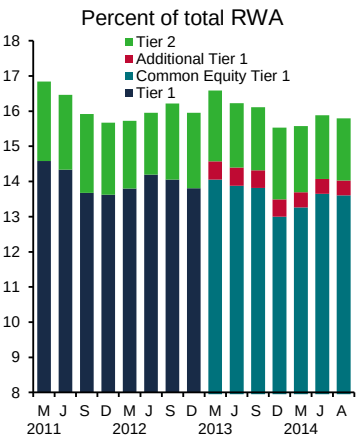
The leverage ratio is also a reflection of commercial banks' solvency. Its measurement follows a proposal currently being discussed by the Basel Committee on Banking Supervision (BCBS); it is expected to become an international standard for banks at a global level. This ratio has remained above 9 percent in recent years (graph 48c). The BCBS is yet to determine the reference level for such indicator, although it is expected to range from three to six percent.

Graph 48
Solvency Indicators

a) Capital adequacy ratio1/

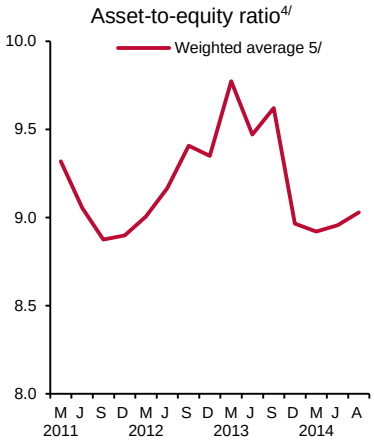
Figures as of August 2014
Source: CNBV and Banco de México

b) Tier 1 and Tier 2 capital3/



Figures as of August 2014
Source: CNBV and Banco de México

c) Leverage ratio



Figures as of August 2014
Source: CNBV and Banco de México

1/ The capital adequacy ratio is calculated by dividing net capital by risk-weighted assets. According to capitalization rules, the resulting ratio should be at least 10.5 percent. Net capital is regulatory capital and comprises Tier 1 and Tier 2 capital.
2/ The weighting procedure is based on each institution's share of total risk-weighted assets.
3/ Tier 1 and Tier 2 capital at the end of each respective year as a percentage of risk-weighted assets for the same period. Since 2013, figures consider new capitalization rules.
4/ The Basel Committee proposes a leverage ratio which is actually the ratio between regulatory capital and total assets. The Tier 1 capital data used in the graph to calculate the respective ratio corresponds to the level registered in each quarter, pursuant to the definition and regulation valid as of that moment. The minimum level for the leverage ratio is yet to be determined, although it is expected to range from three to six percent.
5/ The weighting procedure is based on each institution's share of total risk-weighted assets.

Liquidity

Banco de México and the National Banking and Securities Commission are jointly working on the implementation of liquidity rules based on guidelines issued by the Banking Liquidity Regulation Committee[30] and the BCBS (box 2).

[30] The Banking Liquidity Regulation Committee was introduced in article 96 Bis 1 of the Credit Institutions Law and is comprised of the Minister of Public Credit and Finance (chairman), the Governor of Banco d México, the Deputy Minister of Public Credit and Finance, the President of the National Banking and Securities Commission and two Deputy Governors of Banco de México.

With a view to implementing BCBS Principles for Sound Liquidity Risk Management and Supervision, on May 19, 2014, amendments to the Circular Única de Bancos (banking circular) were published. Additionally, the implementation of rules related to the BCBS Liquidity Coverage Ratio (LCR) is under way. Such rules will enter into force in early 2015, pursuant to the deadline put forth by the Basel Committee. The implementation of the LCR is not expected to have a significant impact on operations of the banking system as a whole, since, according to Banco de México's estimates, most institutions already meet 100 percent of the LCR.[31] Nonetheless, there are a few institutions whose LCR is lower than 60 percent (graph 49), which, according to the BCBS, is the minimum threshold applicable as of January 2015[32] –these are newly created institutions; hence, the new regulation shall grant them a longer deadline.

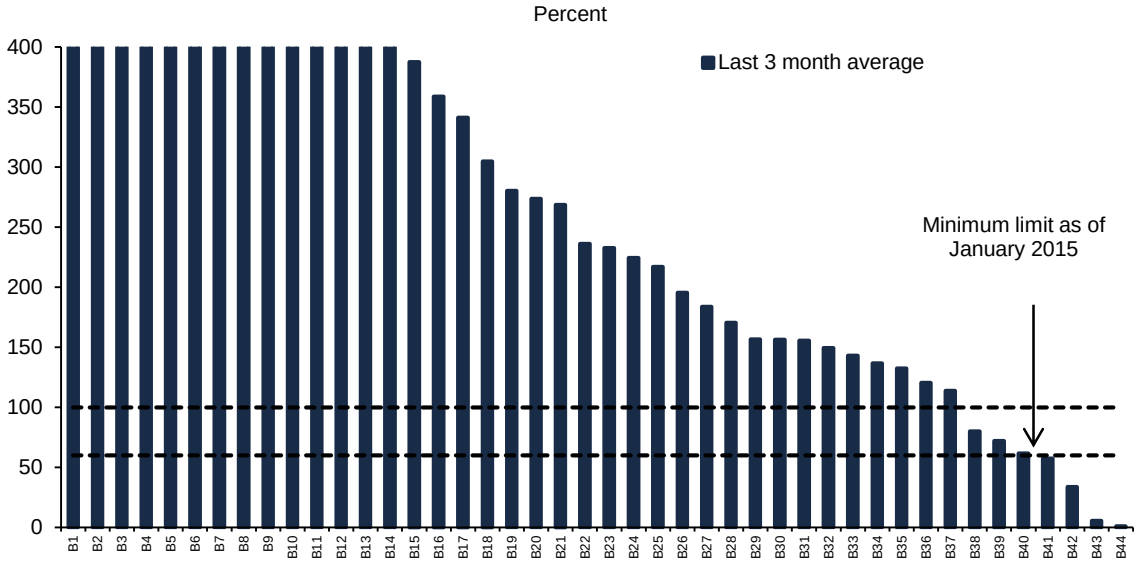
Several institutions have undertaken changes in their financing strategies, aiming at depending less on the short-term interbank market and more on retail funds, which are typically more stable. As a result, there has been a recent improvement in the LCR of a number of institutions. Entities that do not satisfy the LCR must be taking steps to comply with such requirement.

Efforts made by various institutions to improve their liquidity situation can be seen in the percentage of the loan portfolio financed by stable liabilities. Between 2010 and late 2013, this proportion saw a sustained downtrend, as credit growth was mostly financed by liabilities arising from borrowing in the interbank market. Nevertheless, the trend reverted in 2014 (graph 50) because, firstly, the credit growth rate was 8.8 percent as of June, well below the level observed in the last five years (10.8 percent); and secondly, and more importantly, because there was an increase in retail deposits. Indeed, retail funding, which is a more stable source for banks, exhibited a real annual rate of 7.9 percent, higher than last five years' average (6.6 percent).

[31] The Liquidity Coverage Ratio is defined as the proportion of high-quality liquid assets (HQLA) with regard to expected net cash outflows within the next 30 days, given a stress scenario. The definition of the ratio's numerator and denominator are based on Basel Committee guidelines published in January 2013. The LCR calculation is based on certain assumptions for some bank balance components for which the disaggregated or detailed data necessary for the LCR calculation under Basel guidelines are not yet available.

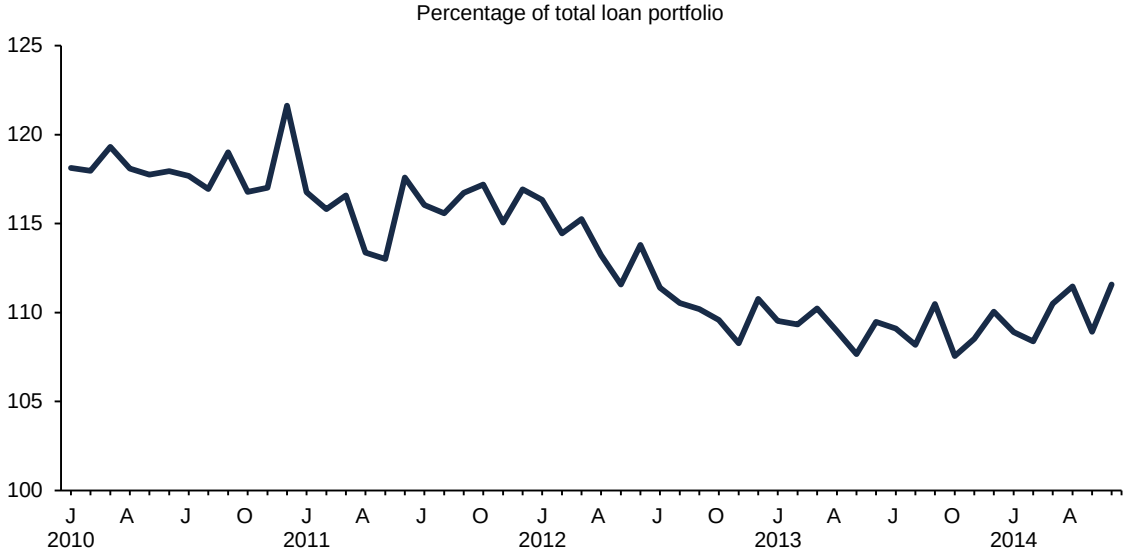
[32] Liquidity rules consider a transition period during which, from January 2015 on, the liquidity ratio shall be at least 60 percent. Such limit shall increase by 10 basis points every year until reaching 100 percent as of January 2019.

Graph 49
Liquidity Coverage Ratio[1/]



Figures as of June 2014
Source: Banco de México
1/ B1 to B13 institutions´ LCR is equal to or greater than 400 percent.

Graph 50
Banking System Stable Funding[1/]



Figures as of June 2014
Source: Banco de México
1/. Stable funding is defined as the sum of demand deposits, deposits made by the general public, funds with maturities of more than one year and equity.

Box 2

Progress Made in the Implementation of International Liquidity Standards in Mexico

In May 2014, amendments to the general CNBV provisions applicable to credit institutions (Circular Única de Bancos) were published in the Official Gazette of the Federation. Such changes incorporated the liquidity risk management criteria issued by the BCBS in 2008.

These criteria address corporate governance procedures relative to liquidity risk; namely, the institution's risk profile, liquidity risk exposure limits, tolerance limits and risk follow-up. Further, banks must share their liquidity position and their liquidity risk management framework, in order to enable market participants to take informed decisions. In addition, two essential devices to follow up liquidity risk and alleviate the effects derived from potential stress shocks were put forth: liquidity stress tests and contingency planning.

Contingency plans provide a guide for action to preserve liquidity during volatility bouts. For that purpose, institutions must at least set forth who, how and when the contingency plan should be activated.

Stress tests allow the identification of potential adverse impacts arising from a liquidity stress situation, considering the specific risks any given institution is exposed to. Institutions should (1) anticipate systemic stress scenarios and combined scenarios including specific stress events for their entity; (2) put forth assumptions for the scenarios they formulate; (3) find correlations between financing sources; (4) stipulate potential losses, constraints and effects in various components; and (5), in general, pinpoint risks and vulnerabilities. Importantly, assumptions for every scenario must be clearly defined, their sensitivity acknowledged and their coherence assessed. As part of the financial reform and the implementation of international liquidity standards in Mexico, amendments to the Credit Institution Law (LIC in Spanish) were included in articles 96 bis 1 and 96 bis 2, which were published in January 2014.

These articles stipulate that banks shall meet liquidity requirements jointly issued by the CNBV and Banco de México, pursuant to the guidelines proposed by the Banking Liquidity Regulation Committee, whose first session was held on October 17, 2014. Also, such articles indicate the punitive measures the CNBV shall enforce in case of non-compliance. According to the LIC, such measures shall take into account the size, frequency and duration of the breaches.

In that sense, the CNBV and Banco de México have strived to implement the Liquidity Coverage Ratio (LCR). In conformity with the BCBS, the requirement shall come into force with a minimum level of 60 percent by early 2015, and a level of 100 percent in 2019.

This quantitative requirement seeks to encourage banks to maintain high-quality liquid assets (HQLA) in order to meet their obligations during a 30-day period, given a systemic or individual stress scenario. Within those 30 days, banks and supervisors shall be able to take corrective actions or resolve the bank in question in an orderly fashion.

The LCR is defined as the proportion of HQLA with regard to expected net cash outflows (cash outflows minus inflows):

$$LCR = \frac{HQLA}{Net\ Cash\ Outflows}$$

The numerator includes all eligible HQLA, that is, assets which, according to the corresponding authorities, may be easily converted into cash and with no significant loss in value during a stress episode. Assets labeled as HQLA are classified in categories, on the basis of their features and degree of expected liquidity in a stress scenario. A different discount factor is allocated to each category. In addition, HQLA amounts within the same category have been capped, with the exception of those in the higher liquidity category. With regard to the denominator and with the purpose of preventing cash outflows from being entirely settled with cash inflows, the regulation establishes that a maximum of 75 percent of cash outflows may be settled with inflows. In other words, at least 25 percent of outflows shall be covered with HQLA.

Cash outflows are a percentage of liabilities due or payable within the next 30 days, or stem from potential liquidity needs (for instance, granted credit facilities). Outflow percentages seek to reflect the stability of liabilities during a specific stress event, or the likelihood of occurrence of a potential liquidity need.

Cash inflows represent a percentage of assets payable within the next 30 days. Such percentage does not reflect the probability of default, but the rate at which new loans shall be granted. In other words, institutions are expected to maintain enough HQLA not only to withstand a stress episode but also to continue operations in relative normality during such period.

3.3 Development Institutions

Development banks[33] and trusts are part and parcel of the Mexican financial system. Thanks to them, the public sector can provide services and products that complement those offered by private financial intermediaries. The institutions that make up the development financial system, namely development banks, Fideicomisos Instituidos en Relación con la Agricultura (FIRA) and Financiera Nacional de Desarrollo Agropecuario, Rural, Forestal y Pesquero (FN),[34] provide first- and second-tier credit and guarantees, while offering special development programs and technical assistance. Particularly, in times of economic distress, such intermediaries have become an important vehicle for the implementation of counter-cyclical policies.

Credit Granting

As of June 2014, the direct loan portfolio of development banks, FIRA and FN totaled 670.4 billion pesos, accounting for 17.6 percent of total credit granted by the banking system as a whole (commercial and development banks) and 4.0 percent of GDP. Actually, development banks guaranteed 340.0 billion pesos-worth of additional loans ("net boosted credit"[35]). As of that date, the sum of both concepts was 1.01 trillion pesos (figure 4), which accounted for a share of 26.7 percent in total bank financing (graph 51).[36]

Direct credit can be classified in different ways: as first-tier, second-tier and federal-government-agent credit; or, as credit to the private sector, to the public sector, and federal-government-agent credit; or, by market segment. As of the end of the first half of 2014, the direct loan portfolio recorded a real annual increase of 11.6 percent, of which first-tier credit accounted for 67 percent, second-tier for 32 percent and federal-government-agent credit for the remainder (graph 52).

[33] The term "development banks" refers to the Banco Nacional de Obras y Servicios Públicos (Banobras), Nacional Financiera (Nafin), Banco Nacional de Comercio Exterior (Bancomext), Banco Nacional del Ejército, Fuerza Aérea y Armada (Banjército), Banco del Ahorro Nacional y Servicios Financieros (Bansefi), and Sociedad Hipotecaria Federal (SHF).

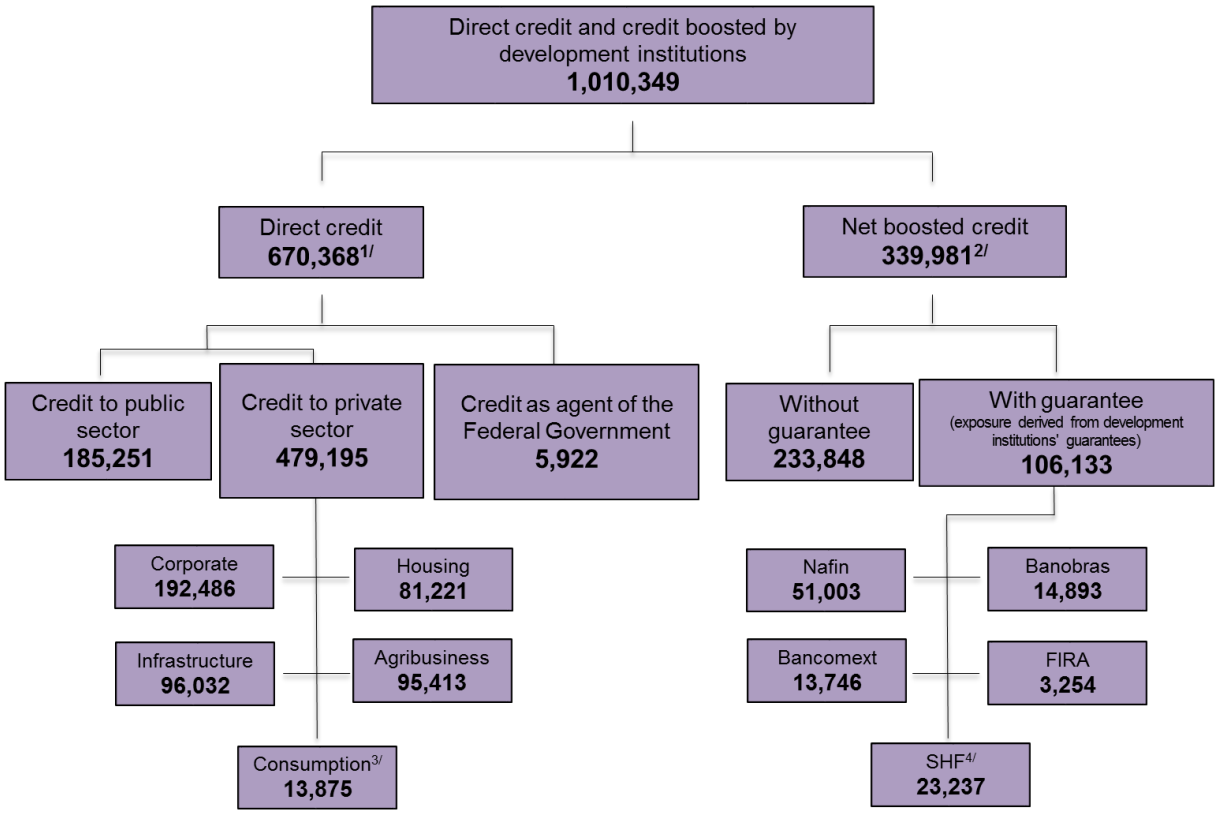
[34] As of January 10, 2014, as part of the financial reform, Financiera Rural (Rural Funds) turned into Financiera Nacional de Desarrollo Agropecuario, Rural, Forestal y Pesquero (FN) (National Funds for Farming, Rural, Forestry and Fisheries Development).

[35] With a view to offering a clearer analysis, from this Report onwards, the term "induced credit" is replaced by "boosted credit". Further, the term "net boosted credit" is also introduced, which refers to the total balance of loans granted by private financial intermediaries, partially guaranteed by development banks, FIRA and FN, and without development banks' funding. The amount includes guarantees issued by the SHF Mortgage Insurance Division. At the end of the first half of 2014, total boosted credit (with and without development banks' funding) totaled 386.4 billion pesos.

[36] Total financing refers to the sum of the loan portfolio and balance boosted by granted guarantees. The amount includes guarantees issued by the SHF Mortgage Insurance Division.

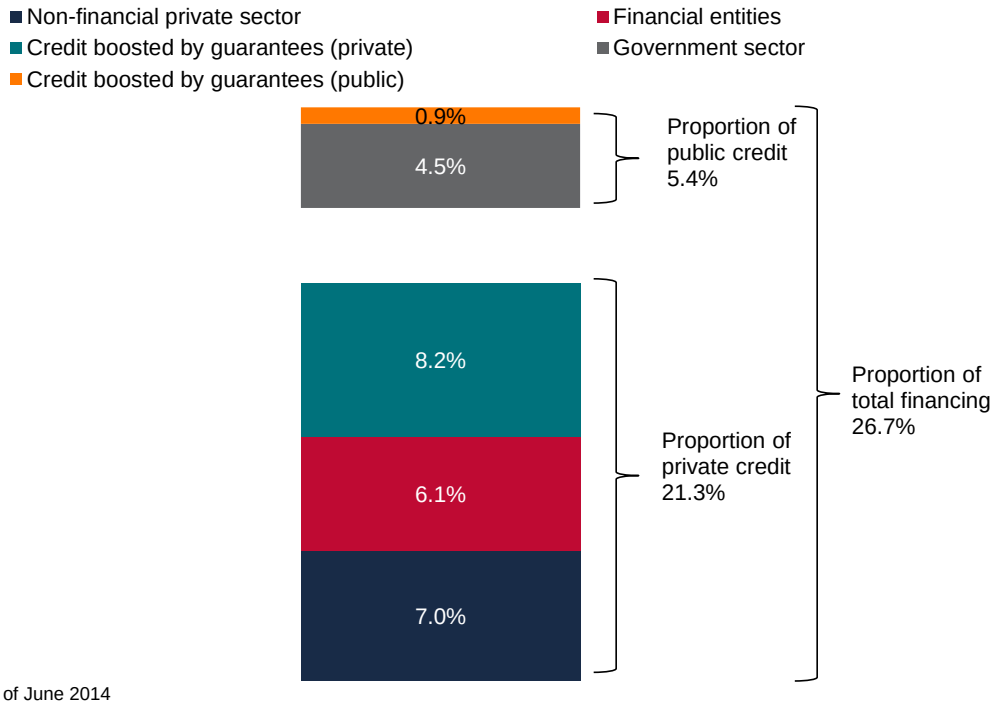
Development bank loans have enjoyed significant momentum in recent years, registering high growth rates, particularly in the placement of loans for infrastructure using new financial schemes – over the last three years, this component exhibited a real annual growth rate of 24.0 percent. By the same token, first-tier credit continued to soar, primarily to the non-financial private sector –over the last three years, its real annual growth rate was 11.4 percent.

Figure 4
Direct Credit and Credit Boosted by Guarantees Granted
Millions of pesos



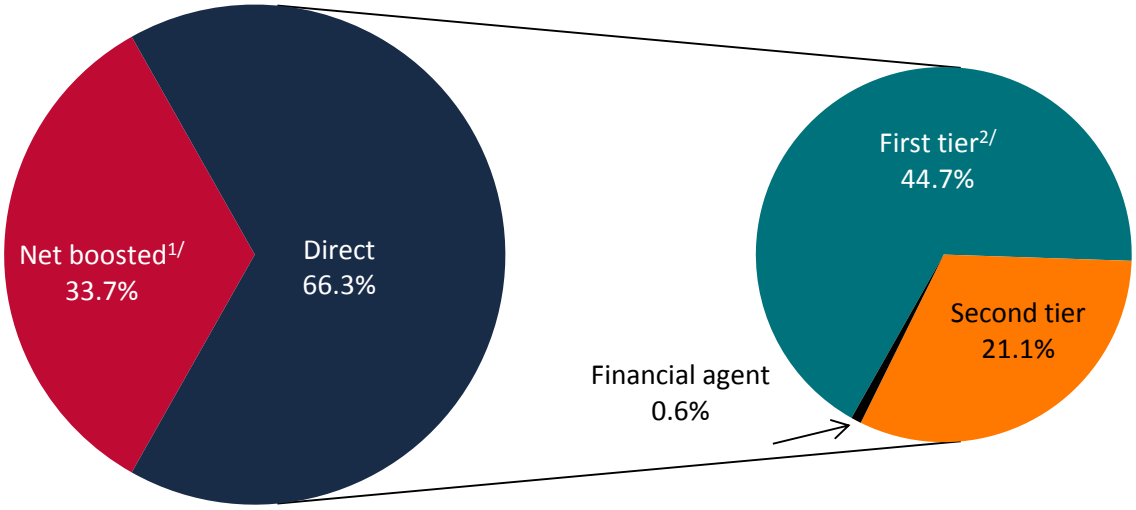
Figures as of June 2014
Source: Banco de México and CNBV
1/ Development banks' on-balance credit. First-tier credit: 451.4 billion pesos; second-tier credit: 212.8 billion pesos.
2/ "Net boosted credit" refers to the total balance of loans granted by private financial intermediaries, partially guaranteed by development banks, FIRA and FN, and without development banks' funding
3/ Consumer credit is comprised of loans granted by Banjército to army forces, payroll loans granted by Bansefi, and loans granted to development banks' employees as employment benefits.
4/ Includes guarantees issued by the SHF Seguros de Crédito a la Vivienda (scv).

Graph 51
Development Banks, FIRA and Financiera Nacional's Share in Total Bank Credit
Percent



Figures as of June 2014
Source: Banco de México

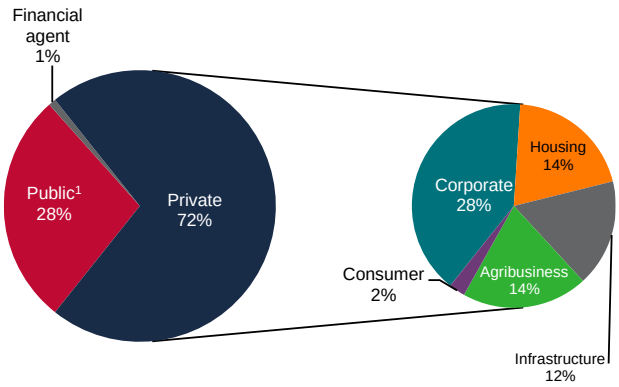
Graph 52
Composition of Total Credit Balance
Percent of the total balance



Figures as of June 2014
Source: Banco de México
1/ Boosted credit includes SCV.
2/ First-tier loans correspond mainly to Bancomext, Banobras and Banejército.

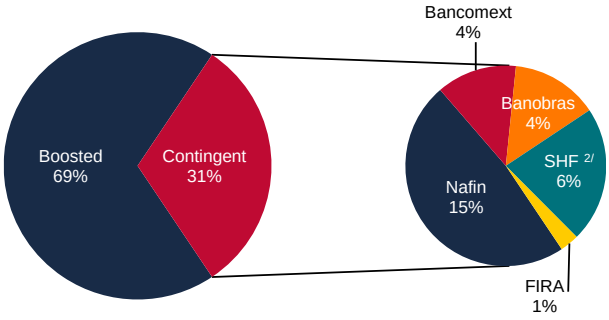
Graph 53
Composition of Direct and Net Boosted Credit Balances

a) Composition of direct credit balance
Percent of the total balance



Figures as of June 2014
Source: CNBV and Banco de México
1/ Credit to states and municipalities totaled 152.6 billion pesos
2/ Includes guarantees granted by the scv

b) Composition of net boosted credit balance
Percent of the total balance



Figures as of June 2014
Source: CNBV and Banco de México

As of the end of June 2014, first-tier credit grew by 16.8 percent in real annual terms (graph 54). This favorable performance was mainly driven by real annual growth in the Banobras and Bancomext portfolios of 20.0 and 17.2 percent, respectively. During that period, Banobras and Bancomext accounted for 79.9 percent of first-tier loans.

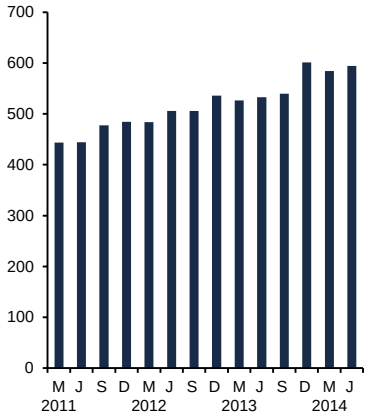
On the other hand, as of the end of the first half of 2014, Nafin, FIRA and the SHF[37] accounted for 93.3 percent of the second-tier loan portfolio. This portfolio registered a real annual increase of 3.8 percent, compared to its previous level. The total variation can be explained by a real increase of 26.1 percent in the SHF portfolio, 1.3 percent in the FIRA portfolio and a decline of 3.1 percent in the Nafin portfolio.

[37] Credit granted by the SHF includes personal and bridge loans.

Graph 54
Development Banks, FIRA and Financiera Nacional's Loan Portfolios

a) Direct credit portfolio balance

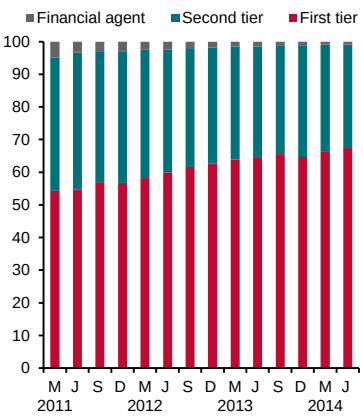
Billions of pesos



Figures as of June 2014
Source: CNBV and Banco de México

b) Portfolio composition by type of credit

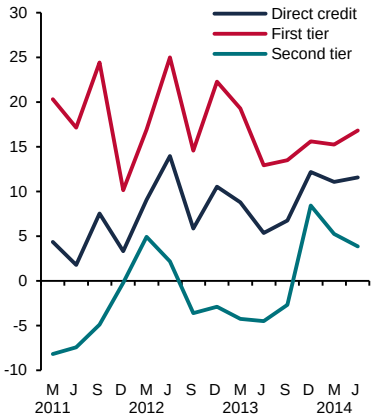
Percent



Figures as of June 2014
Source: CNBV and Banco de México

c) Direct, first- and second-tier portfolios

Annual percent change



Figures as of June 2014
Source: CNBV and Banco de México

1/ Financiera Nacional de Desarrollo Agropecuario, Rural, Forestal y Pesquero (National Funds for Farming, Rural, Forestry and Fisheries Development).

Trends in Direct Credit to the Private and Public Sector

As of June 2014, direct loans granted to the private sector by development banks, FIRA and FN totaled 477.6 billion pesos (graph 55b), accounting for 72 percent of these institutions' total loan portfolio. Between June 2013 and June 2014, this portfolio registered a real growth rate of 9.6 percent (graph 55c). In particular, the annual growth rate of loans to the corporate sector is noteworthy (12.2 percent in real terms), as well as those of loans to the housing and consumer sectors (9.3 and 23.3 percent, respectively).

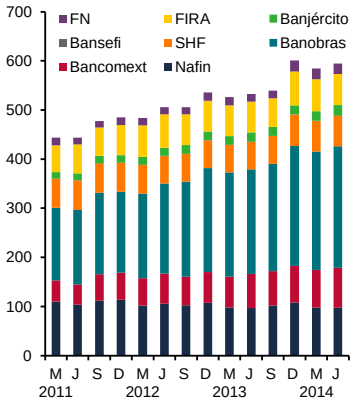
The share of development bank loans in public sector financing continues to recede. Excluding Banobras, whose main purpose is to fund public sector infrastructure projects, loans to this sector (federal government, state-owned entities, states and municipalities) decreased by 40.5 percent in real terms over the last year. Considering Banobras, the public sector loan balance totaled 185.3 billion pesos, exhibiting a growth rate of 16.8 percent *vis-à-vis* June 2013.

As of June 2014, direct loans to the infrastructure sector for projects with their own source of payment was 95.6 billion pesos, essentially granted to road construction projects. Over the last three years, loans to this sector nearly doubled, largely thanks to the support of the Fondo Nacional de Infraestructura (National Infrastructure Fund) via subordinated loans.

Graph 55
Development Banks, FIRA and Financiera Nacional's Direct Loan Portfolios

a) Direct credit portfolio balance and share by institution

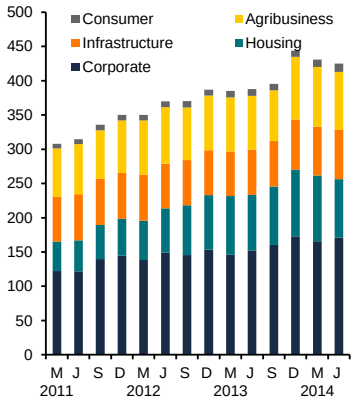
Billions of constant 2010 pesos



Figures as of June 2014
Source: CNBV and Banco de México

b) Credit to the private sector by type of activity[1/]

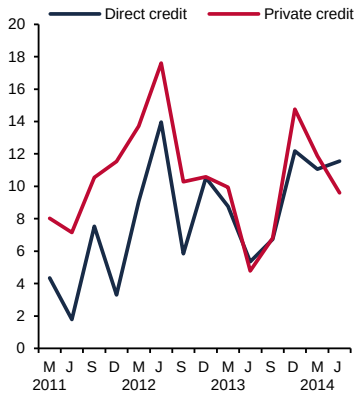
Billions of constant 2010 pesos



Figures as of June 2014
Source: CNBV and Banco de México

c) Direct and private credit

Annual percent change



Figures as of June 2014
Source: CNBV and Banco de México

1/ In order to facilitate comparison with other sections of this Report, credit to the private sector by type of activity includes first- and second-tier loans. Consumer credit comprises loans granted by Banjército to army forces and loans granted to development banks' employees as an employment benefit.

On the other hand, loans granted by Nafin and Bancomext to the private sector registered an annual growth rate of 12.1 percent, boosted by large wind and energetic projects. With respect to Nafin, 36.2 percent of loans granted through development programs were destined to production chains, 10.8 percent to the traditional discount program, equipment and micro-enterprises, and 51.6 percent to boosting credit via the guarantee program.[38] Approximately 94 percent of loans granted by Bancomext were channeled to first-tier transactions; among the recipients, the following sectors stand out: industrial buildings, tourism, automobiles, mining and metallurgy, etc.

As of June 2014, loans granted to the housing sector increased 12.2 percent in real terms. The upsurge can be mainly attributed to the expansion of the SHF portfolio (10.8 percent in real terms). During such period, SHF and Banjército accounted for 98 percent of housing loans. Between June 2013 and June 2014, direct loans to the agribusiness sector granted by FIRA and FN grew by 7.6 percent.

[38] See box 3 in the *Financial System Report*, September 2011.

Issuance of Credit Guarantees[39]

A high percentage of development bank, FIRA and FN transactions are destined to the granting of credit guarantees. Even though these transactions are not recorded on development banks' balance sheets, they have a far from negligible impact on loan supply. As of June 2014, the total balance of boosted credit[40] amounted to 386.4 billion pesos, with an average guarantee of 34 percent (graph 56a). Importantly, boosted credit is placed through commercial banks, non-bank financial institutions and loan securitization vehicles.

The contingent guarantee balance, that is, credit risk arising from the issuance of guarantees to which the aforementioned institutions are exposed, totaled 137.6 billion pesos as of June 2014. As of the same date, such balance exhibited an annual increase of 4.1 percent, compared to the same period of previous year. This growth was chiefly driven by higher Nafin and Bancomext balances, which presented annual growth rates of 11 and 22 percent, respectively. For its part, the SHF balance, including its mortgage insurance division, Seguros de Crédito a la Vivienda (SCV),[41] grew 8.1 percent compared to June 2013, mainly driven by SCV's origination of housing loan insurance policies (graph 56b). As of June 2014, 79.2 percent of guarantees had been granted by Nafin, SHF (including SCV) and FIRA. Over the same period, Bancomext's contingent guarantee balance registered a growth rate of 54 percent, in line with the objectives put forth in its institutional program. Bancomext accounted for 10 percent of development institutions' total contingent balance.

As of June 2014, boosted credit registered an average of 2.8 pesos of credit granted per peso guaranteed (graph 57a). If the SCV is excluded, the boosted credit balance amounts to 304 billion pesos, and the average to 2.5 pesos of credit granted per peso guaranteed. The contingent balance of development banks is partially backed by counter-guarantee budgetary funds which are granted by several entities such as the federal government, the Ministry of Economy (SE in Spanish), the Ministry of Finance and Public Credit (SHCP), among others.

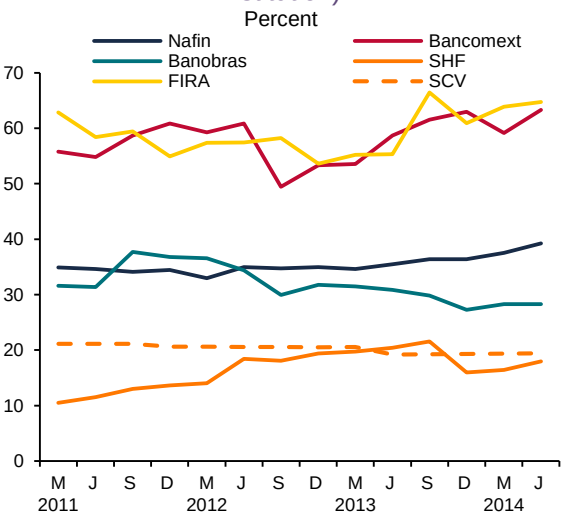
[39] This subsection encompasses development banks' total issuances of credit guarantees, whether development banks, FIRA and FN participate with funds or not. Hence, the herein presented figures do not coincide with figure 4, which only presents net balances.

[40] Total boosted credit refers to the total balance of loans granted by private financial intermediaries, partially guaranteed by development banks, FIRA and FN, with and without development banks' funding. This concept is different from "net boosted credit", which exclusively refers to guaranteed loans without development institutions' funding.

[41] In March 2009, the SHF subsidiary, Seguros de Crédito a la Vivienda (SCV), started operating, and, as of September 2009, the transfer of SHF guarantees to SCV began. As of June 2014, the migration of SHF guarantees to its mortgage insurance division amounted to 11.931 billion pesos. See box 3 in the *Financial System Report*, September 2011.

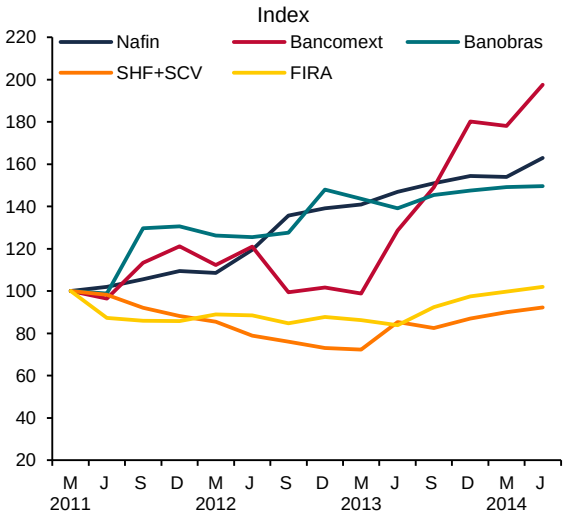
Graph 56
Contingent Balance of Guarantees Granted by Development Banks, FIRA, Financiera Nacional and SCV

a) Average guaranteed percentage (by institution)



Figures as of June 2014
Source: CNBV and Banco de México

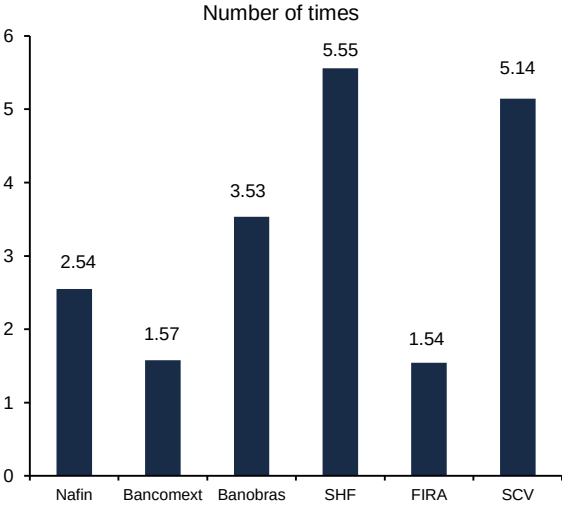
b) Contingent balance (by institution)



Figures as of June 2014
Source: CNBV and Banco de México

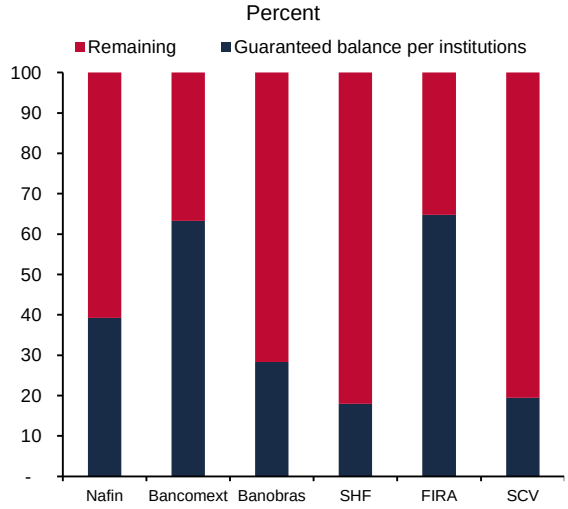
Graph 57
Performance of Guarantees Issued by Development Banks, FIRA and Financiera Nacional

a) Pesos of final credit granted per peso guaranteed (credit boost by institution)



Figures as of June 2014
Source: Banco de México

b) Boosted credit by institution as of June 2014



Figures as of June 2014
Source: Banco de México

Financial Indicators

At the end of June 2014, financial margin recorded real annual growth of 18.2 percent, compared with the same period of previous year (graph 58a). In contrast, loan loss provisions plummeted 38.9 percent in real annual terms (graph 58b), mainly due to amendments to CNBV's rating rules.[42] As a result, at the end of the first half of 2014, net profit surged 58.2 percent in real annual terms (graph 58c).

On the other hand, development banks' average capital adequacy ratio has remained at 15.0 percent over the last three years.[43] As of June 2014, the ratio was 15.2 percent.[44] In conclusion, the development banking sector is adequately capitalized.

As of June 2014, the non-performing loan portfolio of development banks, FIRA and FN grew by 5.4 percent in real annual terms, by virtue of an increase in the non-performing mortgage portfolio, as well as in Nafin and Bancomext's house building non-performing loan portfolio.

Specifically, SHF accounts for 79 percent of the non-performing loan portfolio, Nafin for 6.5 percent, FIRA for 5.7 percent, and FN, Bancomext and Banobras for the remainder (graph 59a). Simultaneously, the coverage ratio remained at 1.31 times over the same period (graph 59b) and the delinquency rate was 4.0 percent. The adjusted delinquency rate, for its part, followed a similar pattern, as certain write-offs for lower amounts were undertaken. Thus, the average adjusted delinquency rate for the period was 4.0 percent (graph 59c).

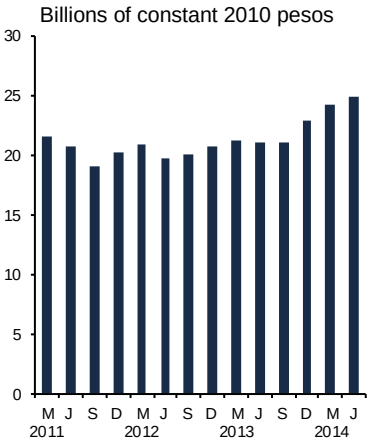
[42] In December 2013, changes were made to the table of risk classification contained in the general provisions for credit institutions issued by the CNBV (art. 129). In consequence, development banks saw a general release of reserves. Nevertheless, for precautionary purposes, some institutions did not release the total required amount and kept part of already built reserves on their balances. This implied a decline in the flow of reserves in income statements during the first half of 2014.

[43] FIRA and FN are not banking institutions, and therefore, they do not calculate capital adequacy ratios.

[44] As of 2013, the calculation of the capital adequacy ratio follows Basel III regulation.

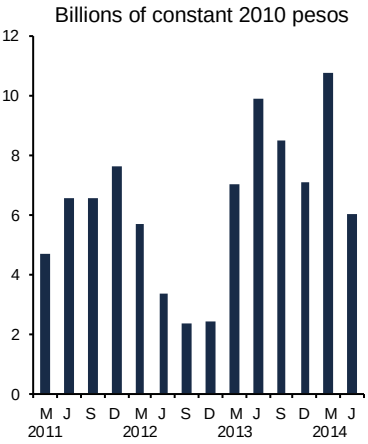
Graph 58
Financial Indicators for Development Banks, FIRA and Financiera Nacional

a) Financial margin (annualized)



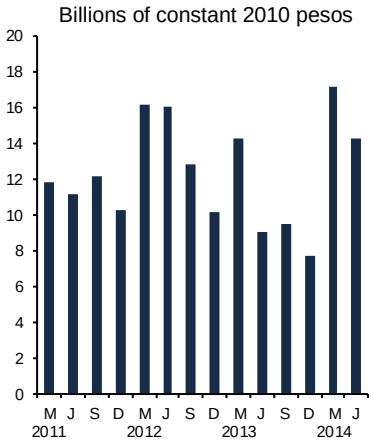
Figures as of June 2014
Source: CNBV and Banco de México

b) Loan loss provisions (annualized)



Figures as of June 2014
Source: CNBV and Banco de México

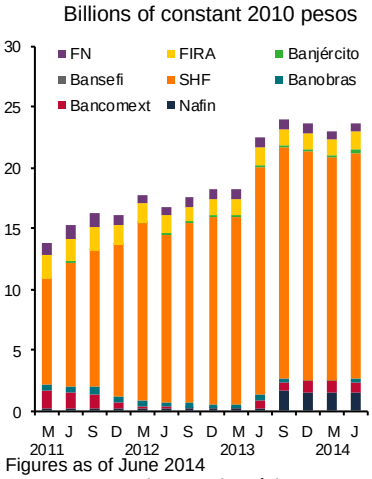
c) Development entities' net profit (annualized)



Figures as of June 2014
Source: CNBV and Banco de México

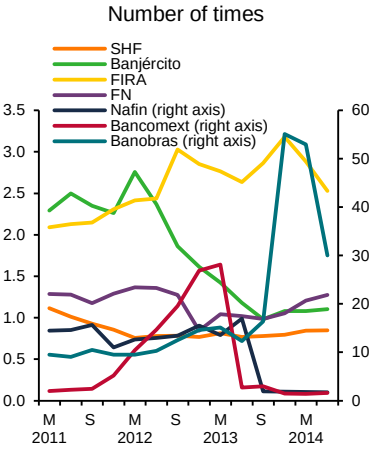
Graph 59
Loan Portfolio of Development Banks, FIRA and Financiera Nacional

a) Non-performing loans



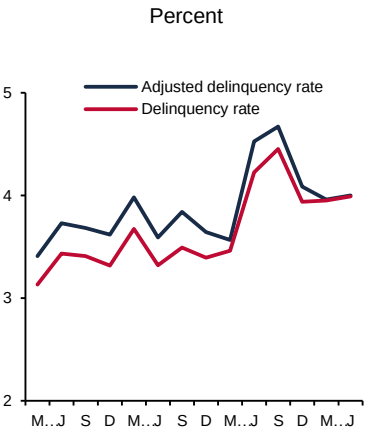
Figures as of June 2014
Source: CNBV and Banco de México

b) Coverage ratio[1/]



Figures as of June 2014
Source: CNBV and Banco de México

c) Delinquency rates[2/]



Figures as of June 2014
Source: CNBV and Banco de México

1/ Loan loss provisions as a percentage of non-performing loans.
2/ The adjusted delinquency rate is the non-performing loan portfolio plus write-offs over the previous twelve months divided by total loan portfolio plus write-offs over the previous twelve months.

3.4 Other Financial Entities and Activities Not Subject to Traditional Banking Regulation

In the wake of the global financial crisis, changes to international regulation have revolved around the banking sector. Since regulatory requirements have become stricter for such intermediaries, it is likely that an increasing number of financial activities and transactions may have been undertaken via entities and activities not subject to traditional banking regulation. Along these lines, most of such entities and activities tap funds from sources other than deposits to later invest them on their own account. Hence, in many cases, the corresponding assets and liabilities are directly built through financial markets, or through specialized devices or transactions (e.g. securitizations or repos[45]). Entities and transactions in this sector may be a source of significant risk for the stability of the financial system as a whole, given their maturity mismatches, leverage and the assumption of excessive credit risk.

Therefore, the G20 Financial Stability Board (FSB) has particularly focused on the assessment of the size and risks posed by entities and activities not subject to traditional banking regulation.[46] Based on the FSB methodology, figure 5 presents a general scheme of financial institutions and activities. According to this methodology, the heading "other financial entities and activities" (OFEA) comprises a group of such transactions. However, not all entities in the OFEA group present the same risks to financial stability. The FSB has especially pointed at risks stemming from maturity mismatches (given the implied liquidity risk) and excessive leverage. Should intermediaries and transactions from the OFEA group be classified on the basis of those two risks, it is possible to obtain a subgroup that encompasses intermediaries and transactions prone to said risks.

According to the FSB methodology, financial entities, vehicles, instruments and activities that, given their characteristics, can be classified within this group in Mexico are: brokerage firms, sofomes (regulated and unregulated),[47] investment funds, companies or

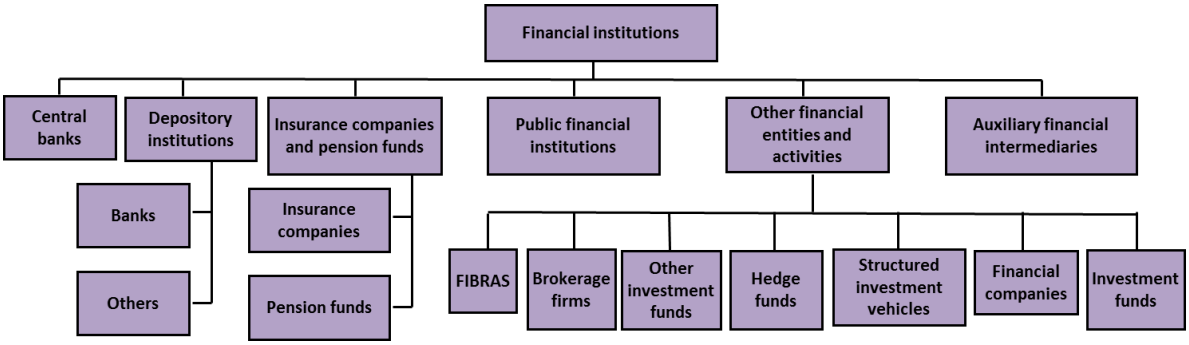
[45] In Mexico, only banks and brokerage firms can obtain funds through repos. Yet, recent changes to the Investment Funds Act (formerly Mutual Funds Act) stipulate that investment funds can also tap resources via repo transactions, which, like every transaction of such kind, shall be subject to Banco de México rules.

[46] This sector is globally known as shadow banking.

[47] Reforms to financial legislation passed seven years ago aiming at deregulating limited scope financial societies (sofoles), financial leasing and factoring companies came into effect in July 2013. As stated in such reforms, all authorizations granted to those entities lost validity, and already authorized financial leasing and factoring companies ceased to be regarded as auxiliary credit organizations –in fact, their winding-up and liquidation were declared by the new regulation, unless they had modified their articles of association so as to suppress any reference to their previous regime, and submitted to the SHCP in a timely manner the public document containing the aforesaid amendments to their articles of association.

entities granting all kinds of loans (e.g. auto financing companies or those issuing non-bank credit cards), together with entities issuing asset-backed securities or securitizations, including local exchange traded funds (ETFs), development capital certificates (DCCs) and infrastructure and real estate trusts (Fibras in Spanish). [48]

Figure 5
Institutions and Activities That Make Up the Financial System (FSB Methodology)



Source: FSB

In Mexico, OFEA account for approximately 20.0 percent of the financial system and 22.0 percent of GDP (graph 60). In contrast, prior to the 2008 financial crisis, this sector accounted for 37 percent of the financial system and 172 percent of GDP.

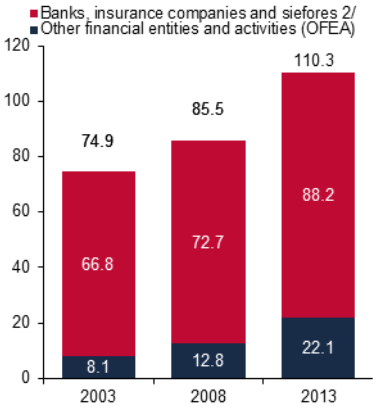
Although the OFEA sector is not as large as the banking sector, its growth has been considerable over the last three years: whereas commercial banks exhibited an average annual growth rate of 4.3 percent over the last three years, the OFEA sector registered an equivalent rate of 11.4 percent. This is partly due to the natural deepening process taking place in the Mexican financial system. Among OFEA, fibras recorded the highest growth rate, as they are newly created instruments undergoing a market consolidation process (table 6). Even though excessive risk taking has not been observed in this sector, prudential rules aiming at restraining its future development have already been issued.

[48] In contrast with last year, we excluded entities whose major fund sources are other than market debt issuances or other sources not based on general public funding. When entities fund their operation through instruments with characteristics similar to those of equities or capital instruments and not debt, the FSB methodology excludes them from the shadow banking system in a strict sense. Therefore, the last two issuing vehicles were excluded, and this does not mean that, in the future, provided they change their way of tapping funds, they couldn´t be part of this sector in a strict sense.

Graph 60
Institutions and Activities That Make Up the Financial System

a) Assets in the financial system[1/]

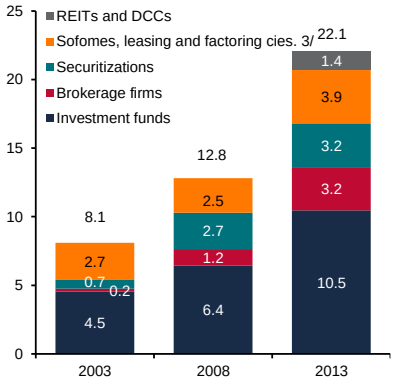
Percentage of GDP



Figures as of December 2013
Source: Banco de México, CNBV, CNSF, Indeval, Consar and AMFE

b) OFEA's assets

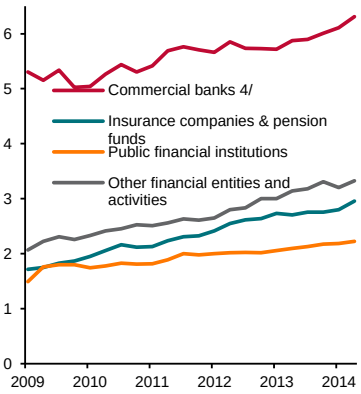
Percentage of GDP



Figures as of December 2013
Source: Banco de México, CNBV, CNSF, Indeval, Consar and AMFE

c) Assets in the financial system

Billions of constant 2010 pesos



Figures as of December 2013
Source: Banco de México, CNBV, CNSF, Indeval, Consar and AMFE

1/ Based on the FSB methodology, which includes assets pertaining to the central bank, commercial banks and other institutions accepting deposits (sofipos, socaps and credit unions), development banks, public development entities, insurance companies, pension funds and Other Financial Intermediaries (OFEA).
2/ Includes the central bank, sofipos, socaps and credit unions.
3/ Includes non-financial companies granting credit cards to their customers.
4/ Includes sofipos, socaps and credit unions.

Even though in Mexico most OFEA[49] are subject to supervision and regulation, norms may be not as strict as those applicable to banks, hence the opportunity for regulatory arbitrage, especially for entities with less stringent regulation carrying out transactions or operations not allowed for banks or with higher capital costs. It is therefore necessary to examine in depth the cases in which, as a result of the new banking regulation, risks not subject to proper rules are being taken that may contribute to heighten systemic risk.

[49] Some entities considered in this sector are not strictly part of the Mexican financial system, such as companies granting auto financing, associated with or affiliated to automakers, as well as credit intermediation in the form of non-bank credit cards issued by department stores.

Table 6
Other Financial Entities and Activities Not Subject to Traditional Banking Regulation (FSB Methodology)

Entities / Activities	June-14	Real annual variation 2T14-2T13
	Billions of pesos	Percent
ENTITIES	**2,404**	**5.2**
Brokerage firms	**368**	**-22.4**
Financial companies	**359**	**1.7**
Regulated sofomes[1/]	73	4.9
Unregulated sofomes[2/]	169	-3.2
Deposit warehouses	12	-2.8
Companies specialized in commercial credit[3/]	26	5.5
Companies that grant consumer credit[4/]	79	9.7
Investment funds[5/]	**1,677**	**15.0**
Mutual debt funds	1,261	12.4
Mutual equity funds	408	24.5
Mutual capital funds	8	-6.7
ACTIVITIES	**946**	**12.2**
Securitizations[6/]	**553**	**5.2**
Mortgage-backed	265	7.4
Infonavit	93	2.4
Fovissste	105	21.7
Commercial banks	33	-3.6
Mortgage sofomes	34	-3.6
Non-mortgage	288	3.1
States and decentralized organs	162	9.0
Private companies	125	-3.6
Capital instruments[6/]	**393**	**24.0**
Local exchange traded funds(Tracs or ETFs)	83	-34.4
Real estate and infrastructure trust funds (fibras)	233	97.7
Development Capital Certificates (DCC)	77	5.8

Memo: For comparison purposes, these figures consider commercial banks', insurance companies' and pension funds' assets (excluding regulated sofomes):

Commercial banks	6,939	7.1
Insurance companies	967	3.7
Siefores	2,369	11.8

Figures as of June 2014
Source: CNBV, Indeval and Valmer
1/ Includes regulated sofomes which do not consolidate their assets with commercial banks.
2/ For calculation purposes, we assume that companies under the previously valid legal figures as of June 2013 managed to successfully modify their articles of association to become unregulated sofomes.
3/ Non-financial companies granting loans to corporate customers, namely financial branches of auto makers, non-financial companies undertaking leasing and factoring activities.
5/ Unlike other countries, in Mexico, all investment funds' assets are marked-to-market.
6/ We consider the amount of current issuances.

Table 7 presents the major risks that OFEA face, which may contribute to magnify systemic risk. Table 8 offers a comparison between prudential regulation applicable to OFEA undertaking direct credit intermediation in Mexico and that applicable to banks. Although

there are unregulated entities in that universe, they are unimportant in terms of size.[50] Furthermore, not all entities rely on short term funds to perform their intermediation.[51]

Table 7
Other Financial Entities and Activities by Type of Activity and Quasi-Banking Risk[1/]

Type of activity	Entity/Instruments/Activity	Specialty in credit intermediation	Source of risk:			
			Transformation of maturities	Leveraging	Financial runs	Prepayments
Measure employed		Credit assets / Total assets	Long-term assets / Total assets	Total assets / Equity		
Management of customers' assets (collective investment schemes)	Debt funds	✓	✓		✓	
	Real estate trusts (fibras)	✓		✓		
	Development Capital Certificates (DCC)	✓	✓			
	Exchange traded funds (ETFs)	✓				
Granting of loans depending on short-term funds	Socaps	✓	✓	✓		
	Sofipos	✓	✓	✓	✓	
	Credit unions	✓	✓	✓		
	Regulated sofomes (which are not bank consolidated)	✓	✓	✓		
	Unregulated sofomes	✓	✓	✓		
	Deposit warehouses	✓	✓	✓		
	Financial companies specialized in credit, financial leasing or factoring	✓	✓	✓		✓
	Companies granting consumer loans	✓	✓	✓		✓
Market intermediation reliant on short-term funds (repos and securities lending)	Brokerage firms	✓	✓	✓	✓	✓
Facilitating credit creation	Credit insurers (financial guarantees)	✓	✓			
Intermediation based on asset securitizations	Public mortgage-backed securities (Infonavit and Fovissste)	✓	✓	✓		✓
	Public non-mortgage securities	✓	✓	✓		✓
	Banks and sofomes' mortgage-backed securities	✓	✓	✓		✓
	Private non-mortgage securities	✓	✓	✓		✓

Source: Banco de México

1/ Red check marks indicate cases where the described behavior could occur or currently occurs only in some of the entities of this specific sector in Mexico. Risks in the columns are defined as:

- Maturity transformation risk: arises from obtaining short-term funds to invest in long-term assets (maturity mismatch).
- Leveraging risk: arises from the use of techniques or strategies in which one borrows funds to subsequently purchase assets, with the purpose of increasing potential investment profits (losses).

[50] Mexican regulation sets forth that, under certain circumstances, some originally unregulated entities must comply with prudential and disclosure rules similar to those for banks. For instance, unregulated sofomes issuing public debt in the market must follow rules applicable to issuers. Further, the financial reform is to put forth secondary regulation that shall bring sofomes linked to popular credit and savings entities under the law, and not only, as hitherto, those linked to commercial banks and financial groups.

[51] Some entities obtain funds from their partners' contributions or savings, and thus, in such cases, funds correspond to capital sources rather than liabilities. Others count on protection funds that serve as deposit insurance –said funds mitigate the potential risk posed by depositors' sudden withdrawals.

Table 8
Regulation Applicable to Entities and Activities Not Subject to Banking Regulation

Type of activity	Entity	Capitalization	Accounting principles	Prudential criteria					
				Risk management	Portfolio provisions	Risk diversification	Liquidity requirements	Information disclosure	Credit process
	Commercial banks	✓	✓	✓	✓	✓	✓	✓	✓
Management of customers' assets	Debt investment funds	×	✓	×	n.a.	✓	✓	✓	n.a.
	Real estate trust funds (fibras)	×	✓	×	×	×	×	✓	×
	Development Capital Certificates (DCC)	×	✓	×	×	×	×	✓	×
	Exchange Traded Funds (*ETF*s)	×	×	×	n.a.	×	×	✓	n.a.
Granting of loans dependent on short-term loans	Socaps								
	Basic	×	×	×	×	×	×	×	×
	Level 1	✓	✓	×	✓	✓	✓	✓	×
	Levels 2 - 4	✓	✓	✓	✓	✓	✓	✓	✓
	Sofipos								
	Level 1	✓	✓	×	✓	✓	✓	✓	×
	Levels 2 - 4	✓	✓	✓	✓	✓	✓	✓	✓
	Credit unions	✓	✓	✓	✓	✓	✓	✓	✓
	Regulated sofomes	✓	✓	✓	✓	✓	×	✓	✓
	Unregulated sofomes	×	×	×	×	×	×	×	×
	Deposit warehouses	×	✓	×	×	×	×	✓	×
	Financial companies specialized in credit, financial leasing or factoring	×	✓	×	×	×	×	✓	×
	Companies granting consumer credit	×	×	×	×	×	×	×	×
Market intermediation dependent on short-term funds	Brokerage firms	✓	✓	✓	n.a.	✓	✓	✓	n.a.
Facilitation of credit creation	Credit insurers (financial guarantee)	✓	✓	✓	n.a.	✓	✓	✓	n.a.
Intermediation based on asset securitizations	Public and private securitizations	×	✓	×	×	×	×	✓	×

Source: Ley de Instituciones de Crédito, Ley de Protección y Defensa al Usuario de Servicios Financieros, Ley General de Organizaciones y Actividades Auxiliares del Crédito, Ley de Ahorro y Crédito Popular, Ley para Regular las Actividades de las Sociedades Cooperativas de Ahorro y Préstamo and Ley de Uniones de Crédito, together with circulars issued by CNBV for each financial entity.
n.a. not applicable

We present below a brief description of some OFEA which grew above the sector average, accompanied by an analysis of risk factors to which such intermediaries may be exposed.

Fibras

Fibras are trusts devoted to the construction and acquisition of real estate domestically, with a view to letting (or potentially selling) said property. They also grant funds for the aforementioned purposes taking a mortgage guarantee. Fibras finance the acquisition of real estate via the issuance of real estate trust certificates (Certificados Bursátiles Fiduciarios Inmobiliarios or CBFI). These certificates grant their holders rights over the income generated by fibras' real estate. These certificates do not guarantee payment of returns or the invested capital to their holders.[52]

Fibras' CBFI placements considerably increased during 2013 and thus far in 2014 (graph 61a). Moreover, one fibra in particular placed debt in the stock market in order to fund an increase in its real estate portfolio. Furthermore, new fibras have been created over this year,[53] some of which have already shared their intention to place debt in the market, whereas others have seen their bank liabilities grow (graphs 61b and c).

Fibras are not obliged to buy back the certificates they issue; hence, they are not exposed to financial runs. Nevertheless, these institutions could indeed be struck by liquidity risk, since their investments are highly liquid, while, in contrast, some of their liabilities (with banks or debt holders) require periodic flows. Moreover, in order to keep tax benefits, they must, among other things, distribute 95 percent of taxable income of the immediately preceding fiscal year.[54]

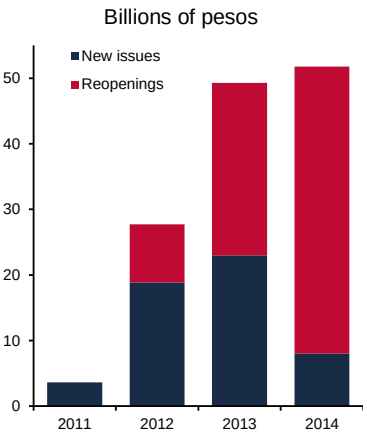
[52] In order to be recognized as such, fibras must abide by rules contained in articles 187 and 188 of the Income Tax Law (LISR in Spanish). Although fibras can partake in credit intermediation, none of them has thus far undertaken such activities.

[53] The entry into operation of the first private fibra has already been announced.

[54] It is worth mentioning that real estate trustors may easily defer income tax in the beginning, as fibras do not settle temporary income tax payments (it is the intermediary who withholds taxes when distributing income to holders).

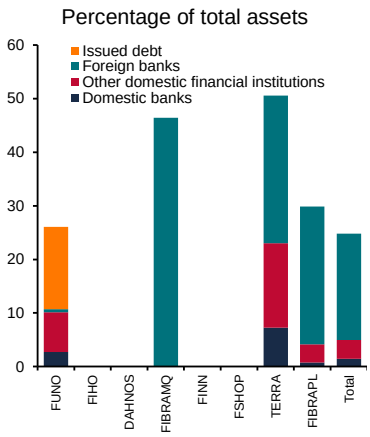
Graph 61
Performance of Fibras

a) Placements



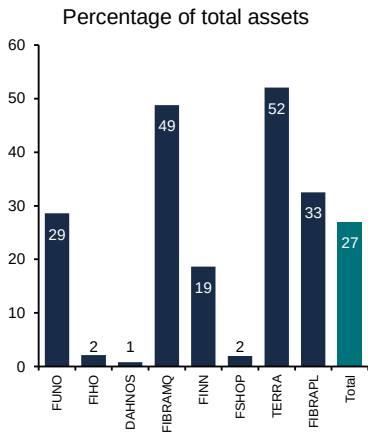
Figures as of October 20, 2014
Source: BMV

b) Major funding sources



Figures as of June 2014
Source: Fibras' financial statements

c) Leverage (L/A) per issuance



Figures as of June 2014
Source: Fibras' financial statements

With a view to limiting potential risks in the fibras sector, posed by excessive leveraging, and thus protecting CBFI holders, the CNBV has already issued rules which cap indebtedness (50 percent of the book value of assets) and establish a minimum debt service coverage ratio requirement –except when liabilities are taken out to refinance previous debt, and in a justifiable manner in both cases.[55] Fibras regulation continues to be quite heterogeneous among different jurisdictions. For instance, a minimum debt service coverage ratio requirement has been set forth in Mexico, which is non-existent in other countries (table 9), no matter how much risks posed by this sector at an international scale have been highlighted.

[55] In case any of these rules is infringed, both a report of such situation and a corrective action plan must be presented to the General Assembly. The regulation included corrective actions and new requirements for periodic disclosure (relevant or annual) of indebtedness level, debt service coverage ratio and characteristics of funds received, among others. In addition, the regulation includes provisions to alleviate potential conflicts of interest that may arise from decisions made by the technical committee or the General Assembly. The objective is that all resolutions be made in the best interest of all holders.

Table 9
International Regulation Applicable to Fibras

Country	Obligatory reimbusement at investor's request	Listing requirement	Restrictions to investors	Restrictions on assets/ investment [1/]	Limits on leverage level	Minumum debt service coverage ratio	Type of fibra	Obligatory Mark-To-Market
France	n.a.	✓	✓	✓	✓	×	Corporate	×
Germany	n.a.	✓	✓	✓	✓	×	Corporate	×
Netherlands	Open-end	×	✓	✓	✓	×	Corporate	×
Spain	n.a.	✓	×	✓	×	×	Corporate	n.a.
United Kingdom	Closed-end	✓	✓	✓	✓	×	Corporate	✓
Mexico	Closed-end	✓	✓	✓	✓	✓	Trust	✓ [2/]
Brazil	n.a.	×	✓	×	×	×	Fund	n.a.
Chile	n.a.	×	✓	✓	✓	×	Fund	n.a.
Canada	Closed-end	✓	✓	✓	×	×	Trust	n.a.
United States	n.a.	×	✓	✓	×	×	Corporate	n.a.
Australia	Closed-end	×	✓	✓	✓	×	Trust	n.a.
Singapore	Closed-end	✓	✓	✓	✓	×	Trust	n.a.

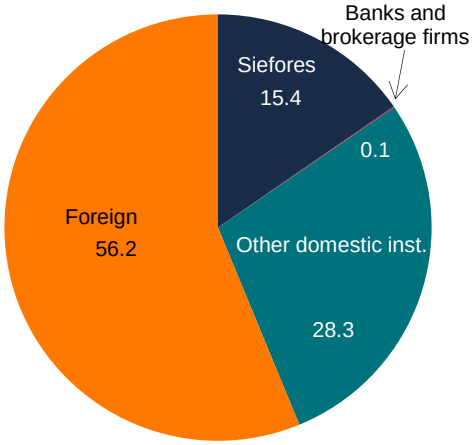
Figures as of June 2014
Source: Global REIT Survey 2013, European Public Real Estate Association (*EPRA*); Biasin, Massimo & Grazia, Ana (2010),"Effects of Regulatory and Market Constraints on the Capital Structure and Share Value of REITs: Evidence from the Italian Market" and Income Tax Law.

1/ Asset requirements help to promote the idea that the sector should be mainly focused on real estate.
2/ The valuation of CBFI shall be carried out by an independent appraiser at least quarterly, or any time there are changes in the trust asset structure (Annex H Bis 2 of CUE).

Most of CBFI issuances have been acquired by foreign holders, drawn by the high yields that these instruments have offered since their creation. Siefores have also acquired these instruments, albeit in a lesser proportion. Last, banks and brokerage firms' exposure to these instruments is limited (graph 62).

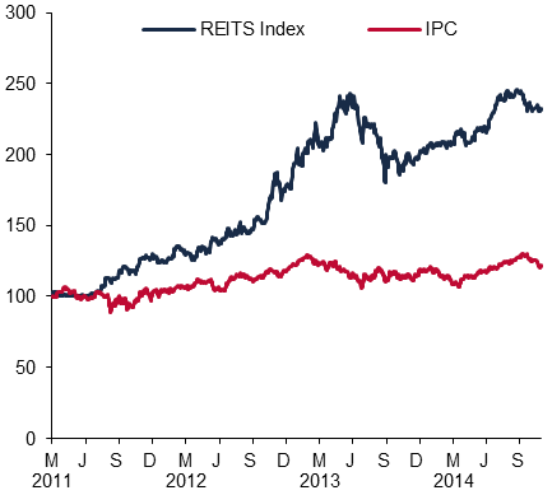
Graph 62
Performance of Fibras

a) Holdings[1/]
Percent



Figures as of June 2014
Source: Banco de México
1/ Marked-to-market balance.

b) Price indexes
March 2011 = 100



Figures as of October 20, 2014
Source: Bloomberg

Newly adopted regulatory changes are expected to curb systemic risk; however, other challenges persist. Even though fibras until now have not been strictly involved in credit intermediary chains, there is an interest in issuing securities that include, as part of their assets, mortgage portfolios or loans for developers.[56] In consequence, these instruments may trigger a potential rise in systemic risk that must be overseen by the respective authorities.

Also, the fact that fibras' managers and originators sustain the right incentives to oversee the adequate performance of investments is a challenge that persists. An adequate incentive system is crucial so that transaction managers or originators preserve a proportion of the issuances, and hence, share risks and profits with holders. Otherwise, risks observed in other countries with similar financial structures could materialize −in such cases, risks are distributed among investors with little follow up capacity.

[56] In that case, fibras would be *de facto* granting loans, and hence, according to the FSB methodology, they would be part of the subgroup of entities with quasi-banking risks (shadow banking).

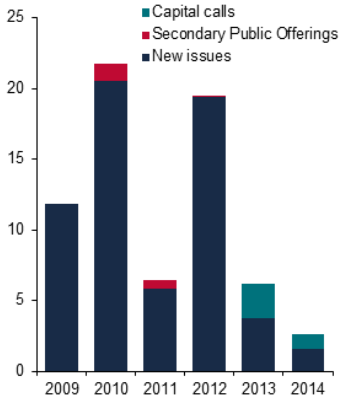
Development Capital Certificates

Development capital certificates are securities issued by trusts whose main investment object are infrastructure projects.[57] Originally, these instruments were designed to obtain capital, rather than debt funds; in that sense, they were not part of an intermediation chain. Nevertheless, they have recently been investing in loan portfolios, and hence, a close follow-up of their performance is imperative.

Graph 63
Development Capital Certificates (DCC)

a) Placements

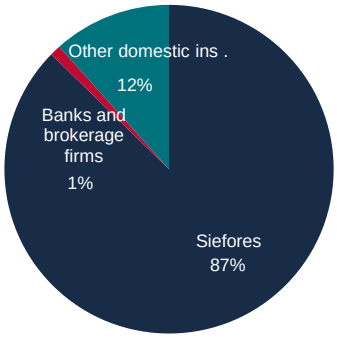
Billions of pesos



Figures as of October 20, 2014
Source: BMV
1/ Marked-to-market balance.

b) Holdings[1/]

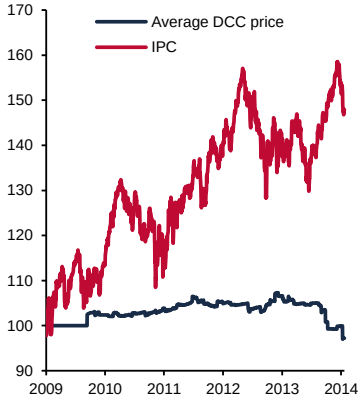
Billions of pesos



Figures as of June 2014
Source: Banco de México

c) Price indexes

Oct 2009 = 100



Figures as of October 20, 2014
Source: Banco de México and Valmer

The long-term horizon of these instruments is at the root of their profitability, for investment decisions and project terms may be protracted in practice. The majority of these certificates are held by siefores, which operate within a long-term investment horizon; in contrast, banks' exposure to such instruments is negligible (graphs 63b and c). Further, the listing of 17 potential issues on the BMV is currently under way, two of which intend to include loan portfolios as part of the trust, and hence, partake in an intermediation chain.[58]

Investment Funds

[57] DCC are defined as trust instruments or securities devoted to financing one or more projects via the purchase of one or several promoted companies, especially in the infrastructure, real estate, mining, corporate and technological development sectors. Returns are variable and dependent on every project's profits and usufruct.

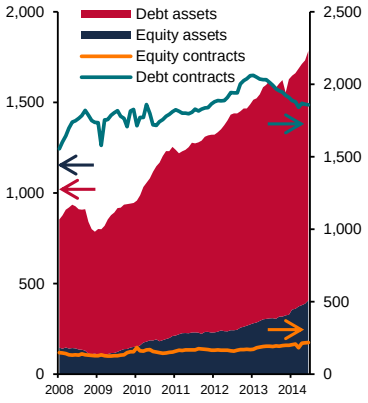
[58] Northgate and PineBridge Mexico propose to include the following instruments on the list of trust assets: corporate capital investments, assets or debt, including senior, mezzanine, subordinated and structured debt; *ABS*, *CLO*, high yield and corporate high yield bonds; leveraged buyouts, acquisition financing, non-performing portfolios, retail loans, etc.

Investment funds represent the third largest financial intermediary in terms of managed assets; moreover, as shown in graphs 64a and b, their growth has been constant throughout time. A high proportion of these intermediaries provide their customers with the possibility of redeeming their investment on the very same day of request or the following day (graph 64c). Investment funds are confronted with the risk of financial runs, that is, when in situations of market turmoil, investors withdraw their investments to prevent losses. Since investment funds manage approximately 17 percent of outstanding securities, the swift settlement of positions may amplify market volatility and even bring about a drop in the prices of securities, which in turn may trigger investors' withdrawals.

Graph 64
Investment Funds

a) Assets managed by investment funds

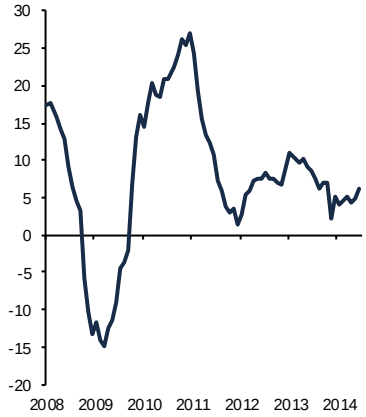
Left axis: billions of pesos
Right axis: thousands of contracts



Figures as of June 2014
Source: CNBV

b) Equity and debt assets

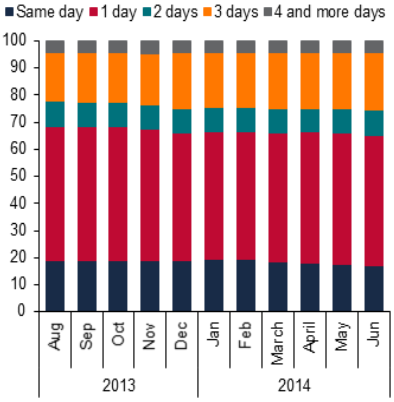
Annual percent change in real terms



Figures as of June 2014
Source: CNBV

c) Term in which investment fund customers may dispose of their funds

Term



Figures as of June 2014
Source: AMIB

Nonetheless, in Mexico, investment funds bear features, which are in line with international guidelines and that help curb the risk of financial runs.[59] First, these intermediaries must mark their assets to market on a daily basis.[60] Second, caps have already been

[59] In order to curb the risk of massive investment fund outflows, the International Organization of Securities Commissions (IOSCO) has already issued guidelines so that these funds be obliged to mark to market the assets they manage (VNAV). The purpose thereof is that investors be aware of the fund value. This makes it clear that the fund does not guarantee invested capital, but rather, that the latter will be linked to the valuation of the investment portfolio at all times. Importantly, in Mexico, all current investment funds determine their portfolio prices in a variable fashion. Additionally, the IOSCO and the FSB have proposed to apply certain restrictions during stress situations; namely, to suspend redemptions, cap the aggregate amount of requested redemptions as a proportion of total assets, or even impose outflow quotas in order to restrain massive sales of investment fund assets. In Mexico, all investment funds may adopt these measures as long as they clearly state them in their prospectus.

[60] This feature is known as Variable-Net Asset Value (V-NAV); in contrast, funds which guarantee the principal and do not reevaluate assets follow a Constant-Net Asset Value (C-NAV) approach. Yet, in periods of high volatility or financial market turmoil, or when investment fund assets have liquidity or valuation problems, the 2014 financial reform provides that

established for portfolio concentration and diversification levels.[61] Third, funds are subject to rules related to the building up of liquidity cushions.[62] Fourth, investment funds include in their prospectus withdrawal limits per customer (in one single day), were they to be confronted with massive withdrawal requests –importantly, they are indeed allowed to charge withdrawal fees.[63] Last, as part of the 2014 financial reform, the CNBV will issue norms governing the suspension of redemptions by open-ended funds' share repurchases. Furthermore, in disorderly market conditions, the CNBV shall authorize investment fund managers to modify the terms for share buybacks, without having to amend their information in their prospectus.

Asset Securitizations

Credit intermediation via the issuance of asset-backed securities or asset securitizations was acutely vulnerable during the international crisis, owing to the then existing financial market incentives. Originators of securitized portfolios generated a credit boom based on lax origination standards, which ultimately resulted in default in both loan portfolios and loan-backed securities.

This situation motivated the implementation of regulation that bolstered prudential risk management. Due to new applicable capital charges, keeping asset securitizations on balance sheets is increasingly more expensive for banks. Further, when issuing such securitizations, they must retain part of the risk in order to keep incentives properly aligned. In Mexico, the securitizations market is still dominated by housing funds, Infonavit and Fovissste, whose conservative structuring inhibits risks posed to holders of securities.[64]

---

investment funds could split, in conformity with the general limits and guidelines set forth by the CNBV. This separation of assets is known as 'side pockets'.

[61] Investment funds shall be subject to a minimum level of diversification, in accordance with the following guidelines: investment in one single issuer shall not exceed 40 percent of the company's assets; the sum of investments in issuers with more than15 percent of assets at an individual level shall not exceed 60 percent of the company's assets. Last, a company's investments in an issuance shall not exceed 20 percent of said issuance, with the exception of securities issued by the federal government and Banco de México, shares tracking a widely disseminated index, investment fund shares, demand deposits, PRLV and bank cedes with terms shorter than one year.

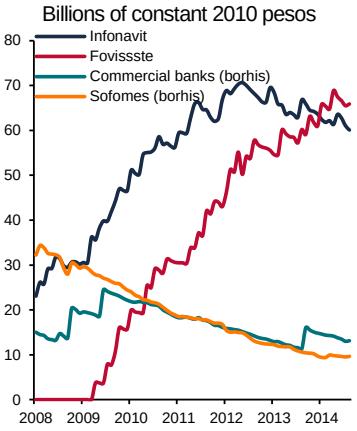
[62] Investment funds shall maintain a minimum percentage of readily realizable securities and securities maturing in less than three months, in accordance with the provisions contained in their prospectus, relative to their objective, investment horizon and policies on purchase and sale of shares.

[63] Due to liquidity problems suffered by some investment funds in 2008 and 2009, the 2 percent maximum ceiling for investment funds' withdrawal fees was suppressed. Moreover, during six months, investment funds were allowed to directly transact government securities with subsidiaries within the same corporate group. In 2010, the corresponding regulation was amended in order to allow investment funds to sell and purchase securities to entities and funds belonging to their manager's corporate group, only in disorderly market conditions and with previous authorization of the CNBV and their board of directors.

[64] For instance, both funds allow the recovery of mortgage loan credit flows via a direct deduction from workers' payroll, and this mitigates the risk of a disorderly portfolio deterioration. It remains to be seen whether this situation will continue once workers outside the formal sector affiliate to these institutes.

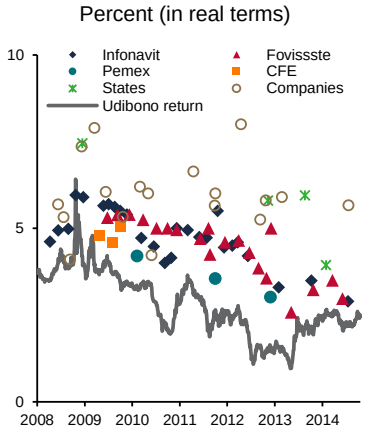
Graph 65
Characteristics of Mortgage-Backed Securities

a) Outstanding amount of mortgage-backed securities



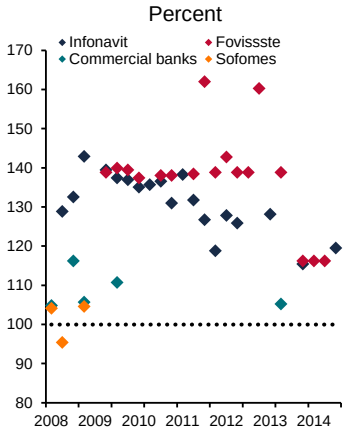
Figures as of October 20, 2014
Source: Banco de México and Valmer

b) Coupon rate of udis issues and udibono's 10-year return



Figures as of October 20, 2014
Source: Indeval and Valmer

c) Securitized portfolio amount as a proportion of issued amount



Figures as of October 20, 2014
Source: BMV

Repo Transactions

The international crisis made it clear that repo transactions offer high potential for increasing financial leverage. Additionally, these transactions are subject to maturity transformation risks (market and liquidity risks), not to mention that they allow the emergence of quasi-banking intermediaries and do not encourage transparency.

In Mexico, unlike other countries, repo transactions are subject to stringent regulation. Banks, brokerage firms, and more recently, investment funds (and their managers) may issue repos to obtain funds. In addition, securities that may be subject to repos require a high credit rating (most repos in the Mexican market are carried out with government securities) (table 10 and graph 66b).[65] Moreover, banks and brokerage firms are subject to capital requirements relating to market risk (i.e., losses in prices of securities) and repo transactions; and last, they must be authorized by Banco de México to issue long term repos.

[65] Indeed, recent changes to the Investment Funds Act (formerly Mutual Funds Act) will enable funds to carry out repo, securities lending and derivative transactions, with credit institutions, brokerage firms and foreign financial entities. Further, they may act as selling or buying parties, borrowers or lenders, as the case may be, and under Banco de México rules. The foregoing shall apply to those funds asking the CNBV for authorization to reform their articles of association in order to include clauses applicable to the new "investment fund" concept. In addition, they shall be entitled to issue debt instruments in furtherance of their business purpose.

Table 10
Repo Transactions by Type of Collateral

Billions of pesos

Type of collateral	Commercial banks	Brokerage firms	Development banks	Total
Governmental	948	376	486	**1,810**
Private	57	37	5	**99**
Banking	59	33	8	**100**
Total	**1,064**	**446**	**499**	**2,009**

Figures as of June 2014
Source: Banco de México

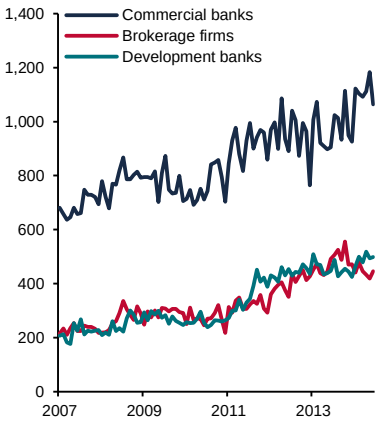
Yet, the transformation of maturities in the Mexican market is far from negligible, as the average term for repos is 4 days, and that of securities thereunder is 800 days (graph 67a).

Even though in legal terms a repo transaction implies a change in the ownership of securities (in other words, it represents the sale of an instrument under a repurchase agreement), given its financial nature, this transaction is a form of secured financing. Prior to the crisis, in many countries, there were no limits to reusing a security accepted as collateral. As this process replicated several times, intermediary chains became increasingly complex and risk was magnified during market disruptions. This practice is known as rehypothecation. Although in Mexico there are no regulatory caps on banks and brokerage firms' rehypothecation, it is limited in practice (graph 67b).

Graph 66
Performance of the Repo Market in Mexico

a) Transaction amount by type of seller[1/]

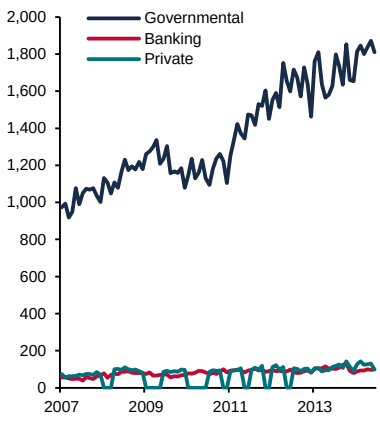
Billions of pesos



Figures as of June 2014
Source: Banco de México

b) Transaction amount by type of security

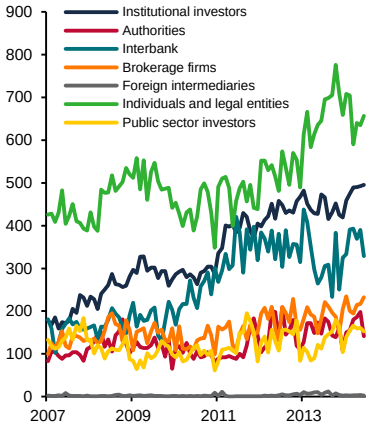
Billions of pesos



Figures as of June 2014
Source: Banco de México

c) Transaction amount by type of counterparty

Percent



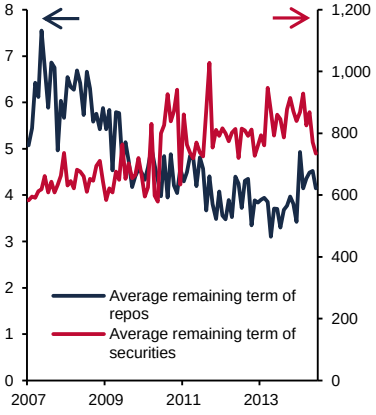
Figures as of June 2014
Source: Banco de México

1/ Refers to the entity that obtains funds in exchange for delivering a security.

Graph 67
Repo Market

a) Remaining terms of repos and collateral related to current transactions as of the end of each month

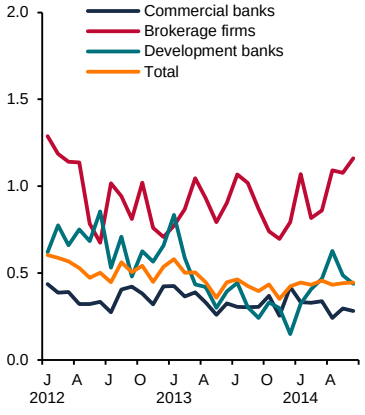
Working days



Figures as of June 2014
Source: Banco de México

b) Rehypothecation by type of institution

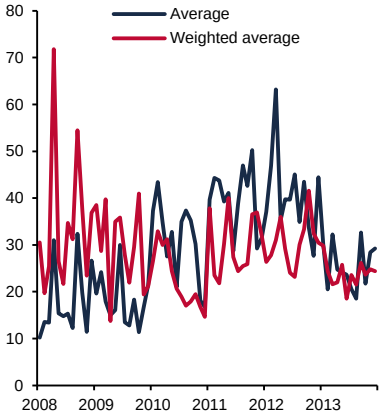
Number of times



Figures as of June 2014
Source: Banco de México

c) Collateral security margin

Basis points



Figures as of June 2014
Source: Banco de México

An important feature of repo transactions is the determination of the margin or haircut applied to the collateral received by the lender or entity granting funds; this must reflect the change in the price of securities over the repo term (graph 67c). Hence, the margin makes it possible for counterparties to properly manage risks.

The FSB has already issued principles to ensure that entities count on robust methodologies to determine margins. More recently, it established minimum margins for transactions whereby the lender or buyer is not a bank or a brokerage firm and that are not settled at a repo central counterparty (excluding transactions involving government securities). An additional consultation document was also issued, applicable to non-centrally cleared transactions among institutions other than banks and brokerage firms. Importantly, properly established margins help contain asset rehypothecation, especially when such practice is not otherwise restrained.

Aside from margins, other regulatory measures may have a significant impact on repo transactions. For instance, rules relative to the Liquidity Coverage Ratio will require banks to maintain liquid assets in order to meet obligations, including liabilities generated by repos. In such cases, the liquid asset requirement will be determined depending on the issuer, the rating of securities attached to the repo, and maturities of repos and their attached securities. As far as bank securities are concerned, when the maturity of the repo is shorter than 30 days and that of the thereto attached security longer than said period, banks shall maintain liquid assets for an amount equivalent to 100 percent of liabilities arising from the repurchase agreement in question.

Interconnections with banks

OFEA's ability to transfer difficulties to the rest of the financial system depends on their interconnections with it. As demonstrated by the last financial crisis, interconnections with banks are a particularly relevant source of contagion during stress periods. If interconnections with banks are large, a shock in OFEA's solvency or value might in turn affect banks, thereby amplifying both the duration and the financial costs of the stress episode. Banks are currently net debtors of a number of OFEA, as the former receive more funds than the loans they grant to the latter. This information suggests that risks arising from repo transactions are restricted; yet, it is imperative to monitor risks at the entity level.

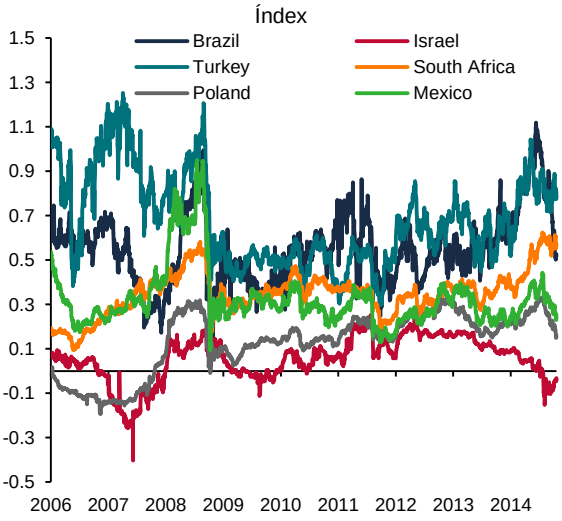
4. Financial Markets and Infrastructures

4.1 Financial Markets

During the period covered by this *Report*, volatility bouts were registered in emerging financial markets, driven by changing circumstances at a global scale. Nevertheless, a global environment conducive to the search for yield –mainly through sizeable transfer positions in emerging markets− has thus far prevalied (graph 68a). In the future, the performance of financial markets will remain closely linked to expectations over central banks' actions in advanced countries, particularly the Federal Reserve (graph 68b).

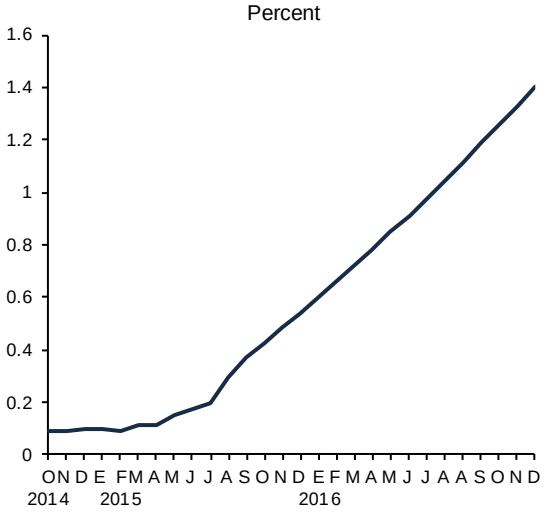
Graph 68
Volatility Adjusted Return and Fed's Expectations over Federal Funds Rate

a) Volatility-adjusted spread between interest rate in domestic currency and interest rate in USD[1/]



Figures as of October 20, 2014
Source: Bloomberg based on Banco de México data

b) Expectations over federal funds rate implied in the OIS curve[2/]



Figures as of October 20, 2014
Source: Bloomberg based on Banco de México data

1/ Based on the implied spread for 3-month currency forwards divided by the implied volatility for 3-month currency options.
2/ Overnight Indexed Swap: An interest rate swap involving a floating rate being exchanged for a fixed interest rate, which is the effective one-day reference rate.

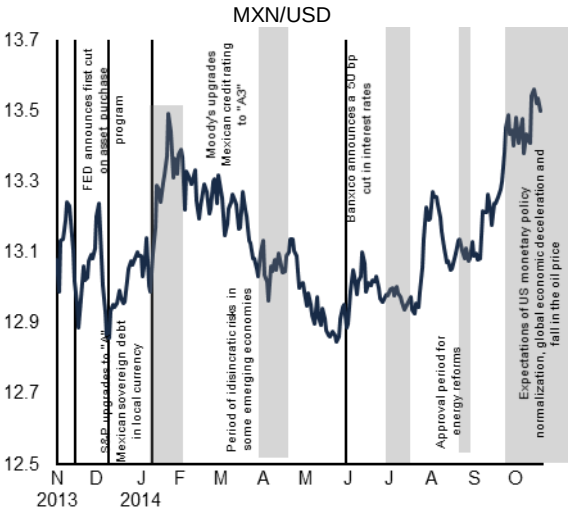
4.1.1 Foreign Exchange Market

During the period covered by this *Report*, the foreign exchange market saw periods of volatility and relative ease (graph 69a). Despite the prevailing uncertainty and various volatiliy bouts, the Mexican peso remains one of the currencies with best relative performance in Latin America (graph 69b). This can be explained by ample liquidity in the market, the orderly conduct of macroeconomic policy, and the approval of substantial structural reforms as well as secondary legislation facilitating the implementation of the former. All

this led the rating agencies such as Standard & Poor's and Moody's to upgrade the Mexican sovereign rating.

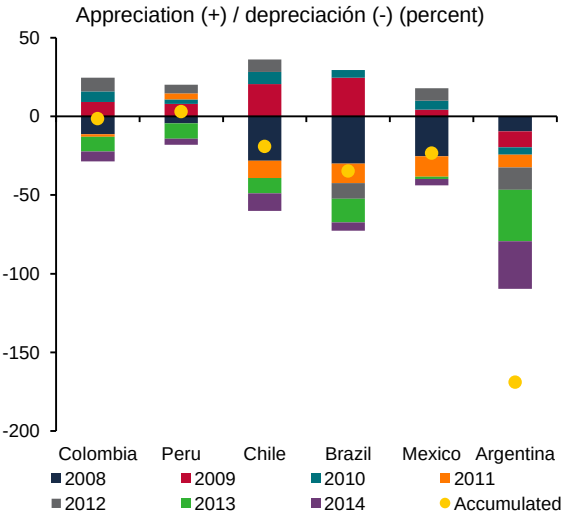
Graph 69
Exchange Rate and Performance of Latin American Currencies

a) Exchange rate (FIX) and risk events



Figures as of October 20, 2014
Source: Banco de México

b) Performance of Latin American currencies



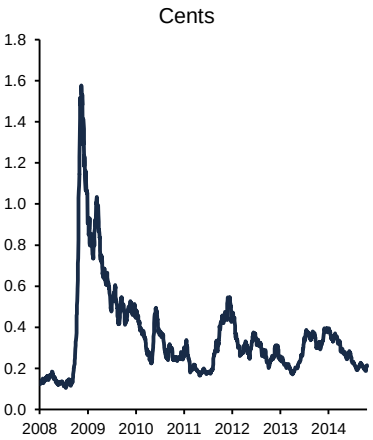
Figures as of October 20, 2014
Source: Bloomberg

Most of the peso depreciation *vis-à-vis* the US dollar has not been driven by domestic factors, but rather by speculation over the US monetary policy normalization process. Importantly, during the period of analysis, the peso was traded under organized circumstances, as witnessed by the continuous decline in the bid-ask spread (graph 70a); further, the daily turnover (graph 70b) over the las twelve months (75.6 billion dollars) remained above the average during the last six years (52.2 billion dollars); even the implied volatility for currency options remained at minimum levels during the same period.

Additionally, international reserves continued to grow and reached an all-time high (190,870 million dollars) (graph 70c). Moreover, the International Monetary Fund (IMF) is currently assessing its credit line renewal.

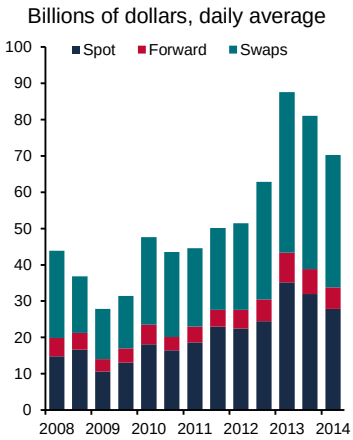
Graph 70
Trading Conditions in the Exchange Rate Market and International Reserves

a) Exchange rate bid-ask spread[1/]



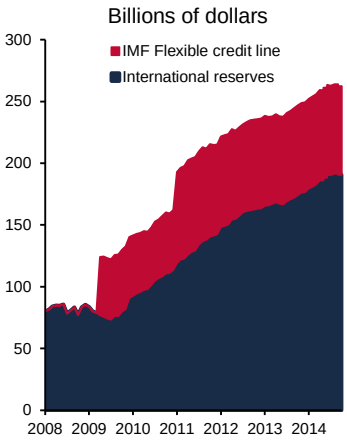
Figures as of October 20, 2014
Source: Banco de México
1/ 20-day moving average

b) Global daily turnover in the MXN/USD exchange market



Figures as of April 2014
Source: Banco de México based on the BIS Triennial Survey and biannual surveys by the Bank of England and the US Federal Reserve.

c) International reserves



Figures as of October 20, 2014
Source: Banco de México

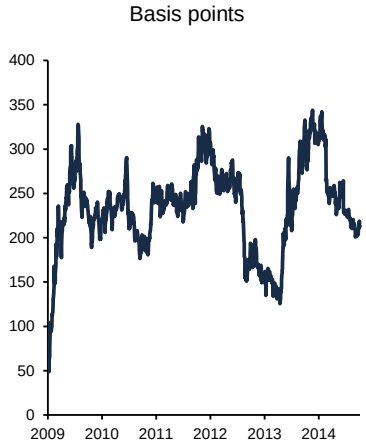
4.1.2 Capital Market

Debt Market

The government debt market followed a trend similar to that of foreign exchange markets, driven by exactly the same events, i.e., the US fiscal and monetary uncertainty. Apart from the above mentioned foreign factors, other domestic elements contributed to an across-the-board fall in interest rates in 2014 (graph 71); namely, a more favorable inflation risk balance, a decline in Banco de México's monetary policy target rate by 50 basis points, and Moody's and S&P's upgrade of Mexican sovereign debt. In consequence, foreign investors' purchases of government debt instruments reached a new record high (graph 72).

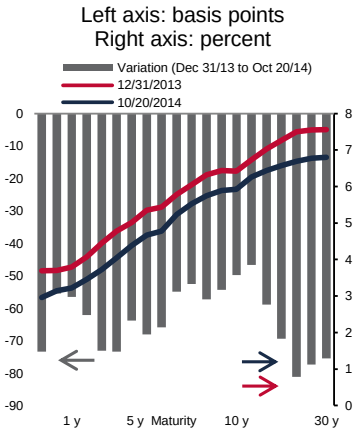
Graph 71
Interest Rates

a) Spread between 30- and 3-year yields



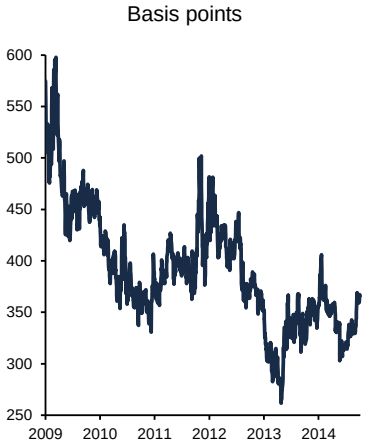
Figures as of October 20, 2014
Source: Proveedor Integral de Precios (Pricing Services Provider)

b) Interest rate curve



Figures as of October 20, 2014
Source: Proveedor Integral de Precios

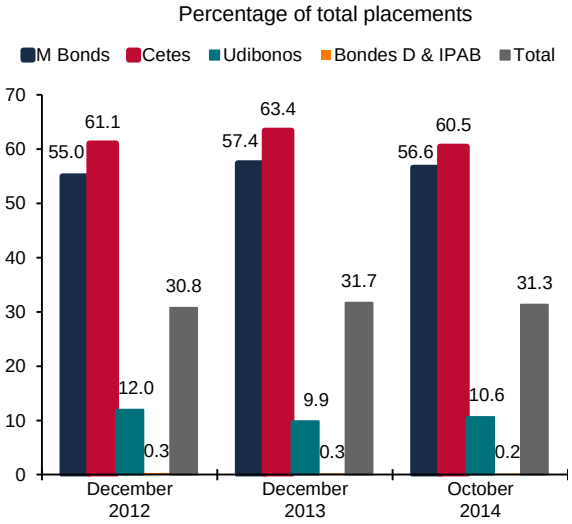
c) 10-year interest rate spread between US and Mexico



Figures as of October 20, 2014
Source: Bloomberg

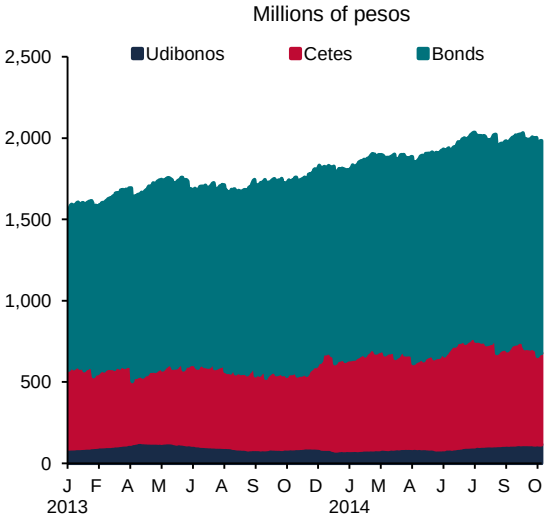
Graph 72
Holdings of Government Securities by Foreign Investors

a) Foreigners' holdings



Figures as of October 20, 2014
Source: Banco de México

b) Foreign holdings of cetes, bonos and udibonos

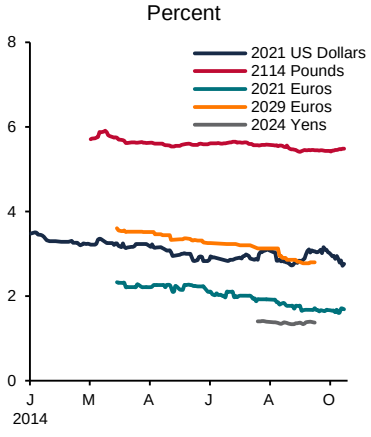


Figures as of October 20, 2014
Source: Banco de México

The SHCP exploited Mexico's appeal for foreign investment and carried out placements in multiple currencies overseas (graph 73c), including US dollars, pounds sterling, euros and Japanese yens. Importantly, in the aftermath of the crisis, the Mexican federal government was the first sovereign issuer that placed debt denominated in pounds sterling at a 100-year horizon and the first Latin American issuer that placed Japanese yeans at a 20-year horizon.

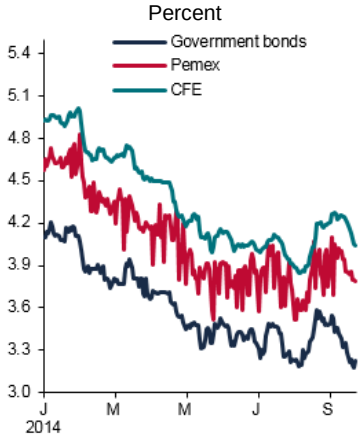
Graph 73
Placement of Public Debt Overseas

a) Federal government bond yield in US dollars



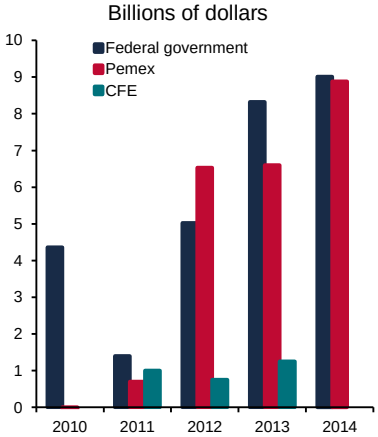
Figures as of October 20, 2014
Source: Bloomberg

b) 10-year bond yield[1/]



Figures as of October 20, 2014
Source Bloomberg

c) Public sector net placements overseas [2/]



Figures as of October 20, 2014
Source Banco de México

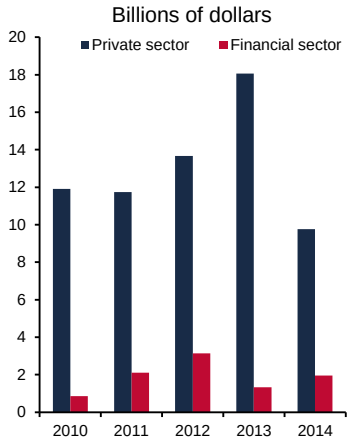
1/ Debt issues in USD.
2/ Includes issues in USD, euros, Swiss francs and yens
.

Thus far in 2014, the corporate debt market has seen a lower level of peso- and dollar-denominated issues *vis-à-vis* 2013. This can be explained by the economic slowdown registered during the first half of the year, and a possible delay in several Mexican companies' sales growth programs triggered by the pending implementation of recently passed structural reforms and the approval of secondary regulation (graph 74).

Further, global risk appetite for corporations in emerging countries started to decline. Last, the amount of peso-denominated debt issued by foreign parties and supranational agencies decreased in 2014 compared to 2013 (graph 75).

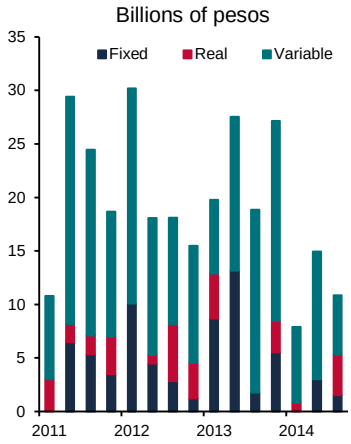
Graph 74
Private Sector Placements

a) Annual long-term placements in international markets



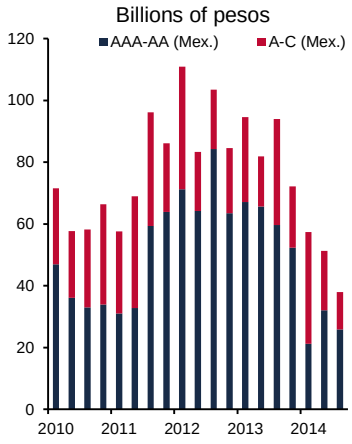
Figures as of October 20, 2014
Source: Banco de México

b) Corporations' quarterly long-term placements in the domestic market



Figures as of October 20, 2014
Source:: Banco de México

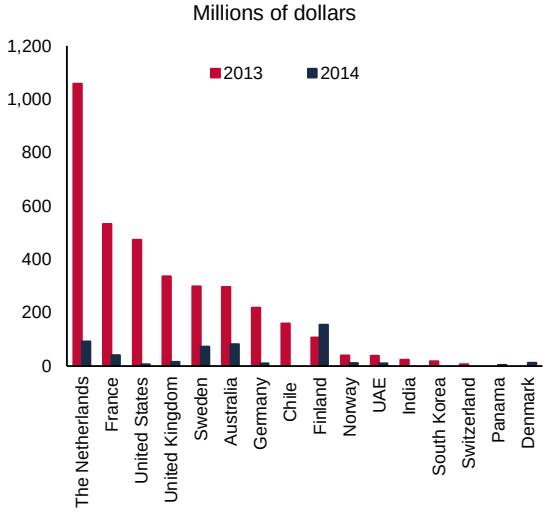
c) Quarterly short-term placements in the domestic market



Figures as of October 20, 2014
Source: Banco de México

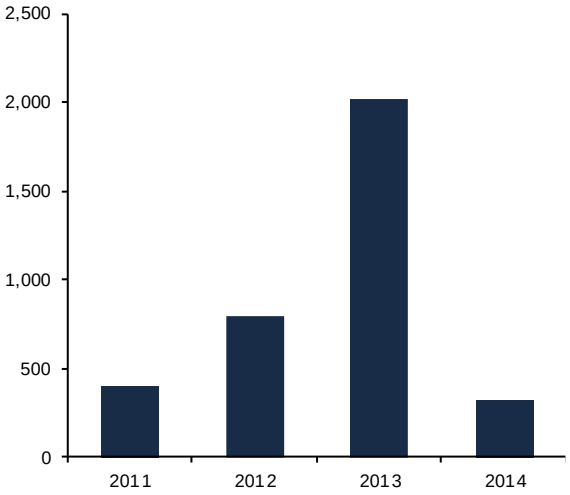
Graph 75
Peso-Denominated Placements by Non-Residents and Supranational agencies

a) Issuances of peso-denominated debt



Figures as of October 20, 2014
Source: Bloomberg

b) Issuances of peso-denominated debt by supranational agencies



Figures as of October 20, 2014
Source: Bloomberg

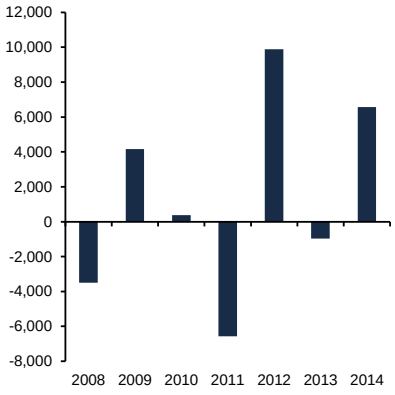
Equities

Similar to what happened with other Mexican financial assets, the BMV's favorable development over the last years can be attributable to greater foreign investors' appetite. This has not only been the case for Mexico, as other emerging markets have also received sizeable portfolio investment amounts, as shown by EPFR Global figures. Nonetheless, the Mexican stock market had a relatively more favorable performance than that of most emerging countries, due to better prospects for the Mexican economy (graph 76). As mentioned before, this positive outlook results from the already approved structural reforms and greater dynamism in US economic activity. The majority of stocks saw a decline owing to the above mentioned factors which had an impact on other assets.

Graph 76
Investment Flows and Performance of Emerging MarketStocks

a) Foreign investment in the domestic stock market

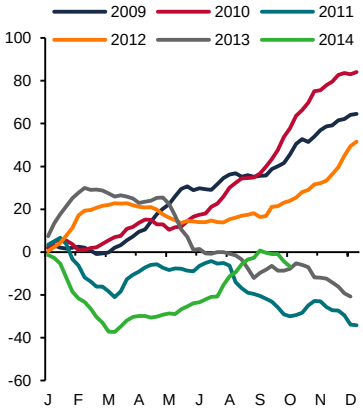
Net flows (millions of dollars)



Figures as of October 20, 2014
Source: Banco de México

b) Flows channeled to emerging equity funds[1/]

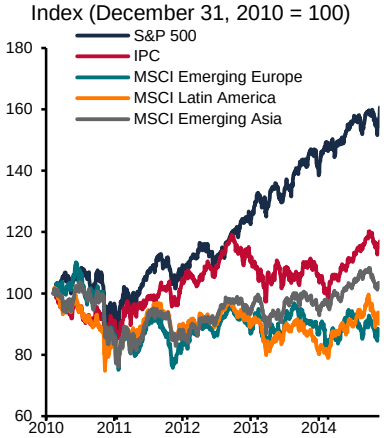
Billions of dollars



Figures as of October 20, 2014
Source: *Emerging Portfolio Fund Research*

c) Stock markets' return in selected markets

Percentage
Index (December 31, 2010 = 100)



Figures as of October 20, 2014
Source: Bloomberg

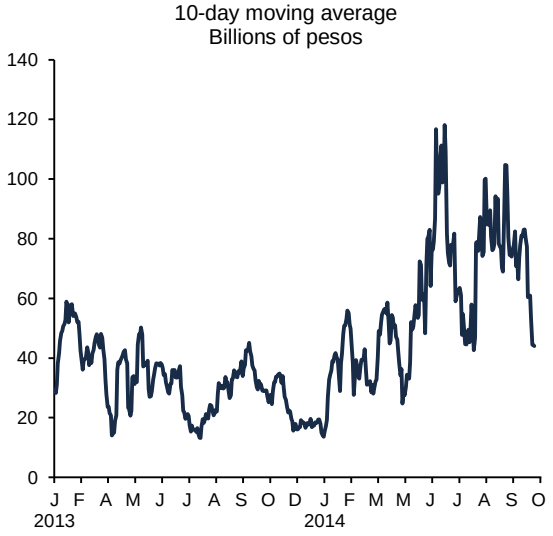
1/ Annual cumulative flows with weekly data

4.1.3 Derivatives Market

During the period covered by this *Report*, significant changes were implemented in the spheres of regulation and trading within the derivatives market, both at a domestic and international level. On October 2, 2013, rules relating to the Dodd-Frank Act came into force. This initiative makes it compulsory for interest rate derivatives between financial institutions of which at least one is a US person to be traded on negotiation platforms named swap execution facilities (SEF).[66] The implementation of these rules triggered a temporary decline in the domestic turnover of TIIE swaps, as initially such transactions were split into two markets depending on whether platforms met regulatory SEF requirements or not (graph 77a). Turnover picked up gradually and even surpassed the level observed before October 2013. It is worth mentioning that most market participants have already migrated to SEF platforms (graph 77b).

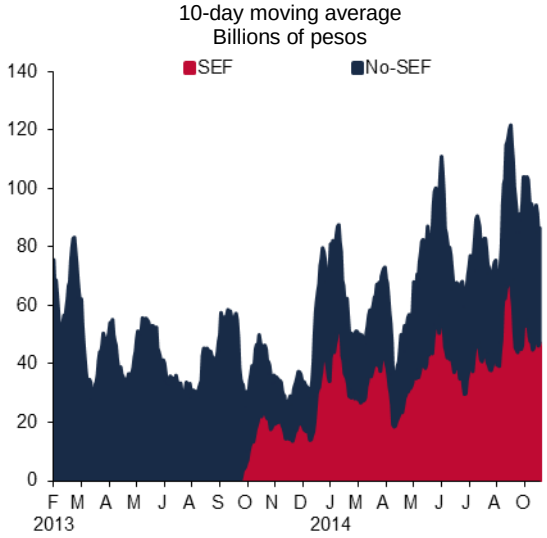
Graph 77
Total Turnover of TIIE Swaps

a) Domestic turnover of TIIE swaps



Figures as of October 20, 2014
Source: Banco de México

b) Daily turnover of SEF and non-SEF interest rate swaps



Figures as of October 20, 2014
Source: Banco de México

As far as the domestic enviroment is concerned, with a view to strengthening the financial derivatives market and increasing transparency therein, on May 15, 2014, Banco de México and the

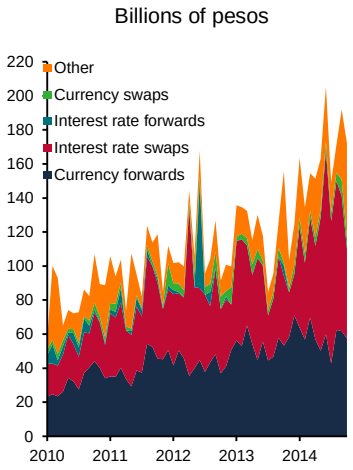
[66] Swap execution facilities (SEF)) are regulated swap trading platforms, which provide information on both sale and purchase positions and allow the execution of transactions among eligible parties. According to Title VII of the Dodd-Frank Act, SEFs must register with the Commodity Futures Trading Commission (CFTC). Trading through SEFs is currently compulsory for four types of interest rate swaps (US dollar, euro, pound sterling and Japanese yen) and two types of credit derivatives (credit default index derivatives for American and European companies).

SHCP published amendments to rules applicable to parties involved in exchange-traded derivatives contracts (Tripartite Rules).[67]

Amendments to those rules allow clearing houses to settle transactions carried out in both derivatives exchanges and electronic platforms. Similarly, the revised rules bolster risk management and operating procedures of clearing houses and allow them to undertake functions relating to data recording and storage. These rules are consistent with norms agreed by G20 financial authorities and other international organizations, and aim at strengthening the operation of OTC derivatives markets and contributing to the stability of the financial system.

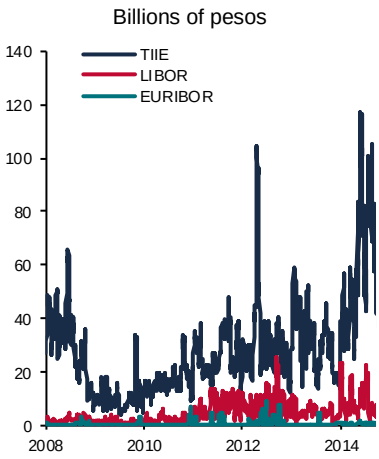
Graph 78
Turnover in the Mexican Derivatives Market

a) Daily turnover by type of derivative and underlying



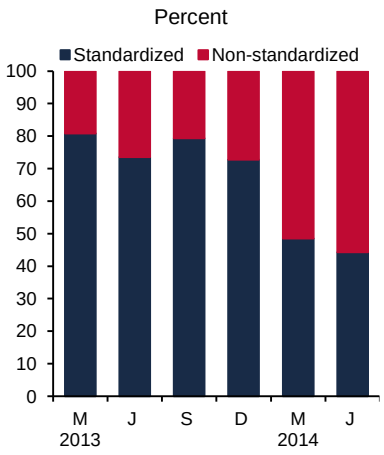
Figures as of October 20, 2014
Source: Banco de México

b) Daily turnover of interest rate swaps by reference rate



Figures as of October 20, 2014
Source: Banco de México

c) Quarterly turnover of 28-TIIE swaps by degree of standardization



Figures as of October 20, 2014
Source: Banco de México

Amendments to Tripartite Rules, together with changes to the *General provisions applicable to companies managing systems that enable securities transactions* (Rules for brokers), set the ground for the settlement of a greater number of transactions via central counterparties.

In the Mexican market, a high proportion of derivatives transactions are carried out via interest rate swaps (graph 78), whereby a party pays a 28-day TIIE coupon in exchange for a fixed rate. The evolution

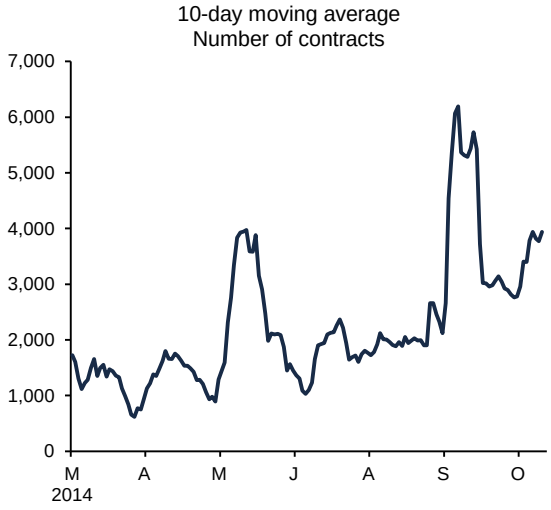
[67] These rules became valid as of August 13, 2014, except for the part relative to data recording and storage services, which shall come into effect in 2015.

of this market has made these transactions more readily cleared through central counterparties. Although in the past these contracts were concentrated in very specific terms, a recent change in their structure has been observed, as witnessed by the existing broader range of terms.

In December 2013, Asigna, the central counterparty for derivatives in Mexico, started before the European Securities and Markets Authority (ESMA) the procedure to be recognized as a central counterparty established outside the European Union. This recognition is the first step for such clearing house to be acknowledged as a certified central counterparty, pursuant to European regulation, and shall subject European financial entities settling transactions through Asigna to lower capital requirements for such transactions.[68]

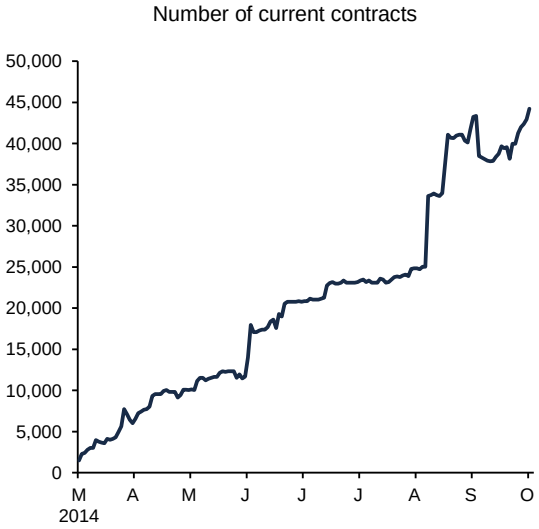
Graph 79
Government Bond Future Contract Due 2024 on MexDer

a) Daily turnover of future contracts due Dec – 24.



Figures as of October 20, 2014
Source: Banco de México

b) Open interest of future Dec - 24



Figures as of October 20, 2014
Source: Banco de México

In parallel, MexDer listed the government bond future contract due Dec 2024, which has had a higher turnover than 10-, 20- and 30-year bond future contracts (graph 79). One of the main features of such instrument is that the bond due Dec 2024, and no other instrument

[68] The CNBV and Banco de México are jointly working on capital requirement rules for central counterparties' exposures, based on Basel Committe Standards.

within a basket of eligible bonds (cheapest-to-deliver), has to be delivered at settlement. Further, future contracts on the government bond due May 2031 were also listed. Moreover, in September 2014, MexDer announced that it would temporarily suspend negotiation of future contracts on the 5-year government bond and udis (investment units), given their low trading volumes.

4.2 Financial Market Infrastructures

Financial market infrastructures (FMIs) are those entities responsible for registering, clearing and settling financial system transactions. These entities encompass: payment systems, central securities depositories, securities settlement systems, central counterparties and central information repositories.

FMIs are divided into two subsets: systemically relevant infrastructures, whose functioning is necessary for the stability of the financial system; and retail payment systems, which provide services for a broad sector of the population.

Systemically relevant FMIs are: the Electronic Interbank Payment System (SPEI), the Securities Deposit, Administration and Settlement System (DALI), the Central Securities Counterparty (CCV), Asigna Clearing and Settlement (Asigna), the Banco de México Accountholders Service System (SIAC) and the International System for Settling Foreign Exchange Transactions (CLS). On the other hand, the infrastructure for retail payment systems is made up of the cheque and deferred transfer clearing house operated by Cecoban, and the automated clearing houses for credit card payments and ATM withdrawals (E-Global and PROSA).[69]

Robust FMIs contribute to financial market efficiency and improve risk management, while fostering information transparency for market participants and authorities. Moreover, efficient FMIs allow the population to carry out day-to-day transactions in a convenient and low-cost manner.

This section describes the steps that Banco de México is taking to strengthen and promote more efficient and accessible FMIs.

[69] The *Financial System Report 2011* presents a detailed description of all these systems.

4.2.1 Adoption of International Best Practice

The *Principles for Financial Market Infrastructures* (*Principles*), published by CPMI and IOSCO in April 2012,[70] are a compilation of best practices for the organization, operation and risk management of FMIs.

The *Principles* include 24 standards by which FMIs must abide. Some of these principles are general, while others were specifically designed for certain types of FMIs (See *Financial System Report 2013*). In general terms, these principles can be classified into four categories: i) organization and corporate governance, which refer to standards relative to the legal basis upon which every infrastructure shall operate, the creation and responsibilities of governance bodies, and policies for comprehensive risk management (Principles 1-3); ii) financial risk and default management, based on best practices for credit, liquidity and settlement risks, collateral management and the determination of default procedures (Principles 4-14); iii) participation, operation and efficiency, which relate to access requirements, operating and communication procedures which FMIs must comply with (Principles 15-22); and iv) transparency, which refers to, first, the FMI's disclosure of information to participants so that the latter understand its functioning, and second, central derivatives repositories' disclosure of information to authorities and the general public (Principles 23-24). Additionally, the Principles include five responsibilities that central banks and other authorities must assume with regard to regulation, supervision and oversight of FMIs.

Based on this framework, in Mexico, 18 standards were put forth for payment systems, such as the SPEI, 21 for DALI and 22 for Asigna and CCV.

As far as DALI, CCV and Asigna are concerned, in May 2013, Banco de México requested compliance self-evaluations from their managers, based on the methodology developed by CPMI and IOSCO. Hence, on account of such results, DALI, CCV and Asigna prepared a work plan to fully meet the aforementioned principles.

a. *Asigna*.[71] During the corresponding period, Asigna worked on principles relating to financial risk manamement (*Principles* 4, 5, 6, 7, 8 and 13).

[70] Committee on Payments and Market Infrastructures of the Bank of International Settlements (BIS) and the International Organization of Securities Commissions. As of September 1, 2014, the Committee on Payment and Settlement Systems (CPSS) turned into Committee on Payments and Market Infrastructures (CPMI).

[71] Asigna is a management and payment trust that clears and settles transactions relating to derivatives (futures, options and swaps) listed on MexDer. Its core function is to act as an intermediary between transaction parties, serving as a buyer to

Asigna must ensure compliance with obligations derived from derivatives contracts whereby it serves as central counterparty, even in the event of their participants' non-compliance. For that purpose, Asigna has a safety network made up of financial resources and procedures to face their participants' default. With regard to financial resources, Asigna has i) a contibution fund, for which every participant provides collateral to cover for price changes in their open contracts; ii) a compensation fund, also known as non-compliance fund, created to mutualize possible defaults; iii) every clearing partner's minimum equity; and iv) the clearing house's own minimum equity (graph 80b).

Asigna is currently revising its methodologies to determine every participant's contibution to safety network funds, and thus, with a high level of confidence, ensure that it has enough resources to meet current and future credit risk exposures *vis-à-vis* its participants. It is therefore considering a wide range of financial stress scenarios, including at least the default of the participant with higher credit exposure. Also noteworthy is the revision of funds accepted as collateral, liquidity risk management and rules and procedures relating to participants' non-compliance.

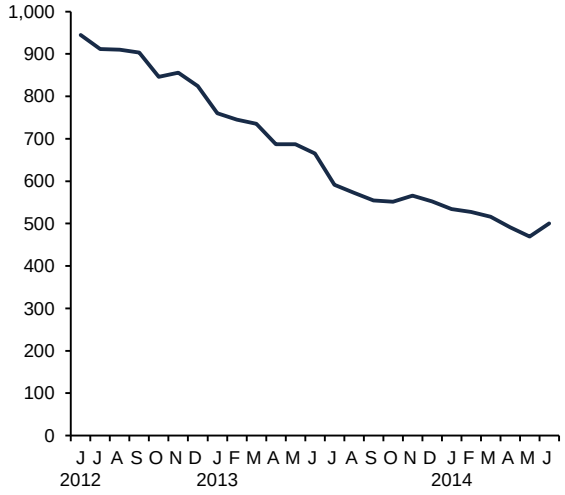
During the first half of 2014, Asigna exhibited a daily average amount of 506 billion pesos in current contracts, which imply a decline *vis-à-vis* the daily average of 713 billion pesos registered during the corresponding period of 2013 –this meant a fall of approximately 29 percent in current notional value (graph 80a). During the first half of 2014, Asigna negotiated a daily average of 922 transactions with a daily average value of nearly 15 billion pesos, compared to a daily average of 723 transactions with a daily average value of 13 billion pesos during the same period of 2013. This represented increases of 28 percent in the number of transactions and 13 percent in value.

every sellller and as a seller to every buyer, thereby mitigating risks related to those transactions. Only trusts managed by banks and brokerage firms can be part of Asigna.

Graph 80
Asigna Clearing and Settlement (Asigna)

a) Daily average current notional value

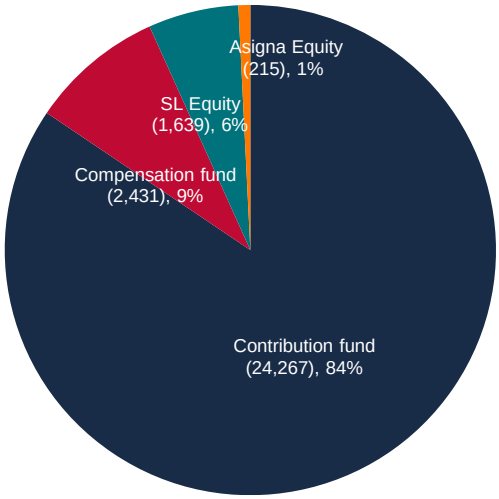
Billions of pesos



Figures as of June 2014
Source: Asigna

b) Safety network funds

Millions of pesos



Figures as of June 2014
Source: Asigna

b. *Central Securities Counterparty*.[72] The CCV has a safety network with financial resources and procedures to meet participants' non-compliance in transactions for which is established as central counterparty. CCV's resources are: i) a contribution fund, made up of initial and variation margin requirements, covered by its participants; ii) a compensation fund to mutualize possible defaults; and iii) the central counterparty's equity.

The CCV is currently addressing opportunity areas related to financial risk principles, such as credit and liquidity risk management, settlement finality, and rules and procedures for participants' non-compliance. Just as Asigna, the CCV is currently revising the size of the aforementioned funds, on the basis of international best practices for such kind of infrastructures.

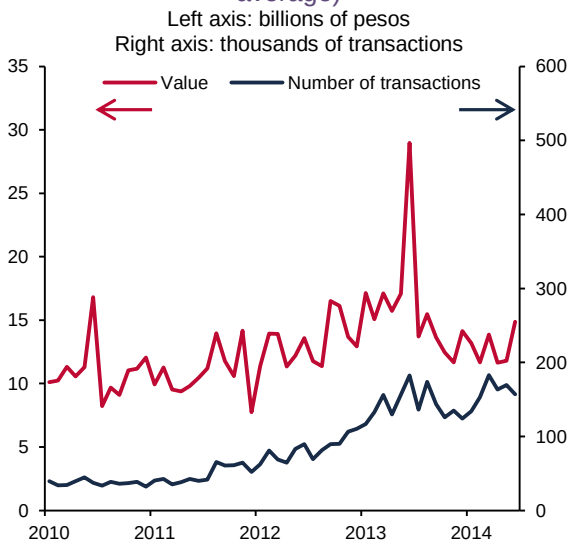
During the first half of 2014, the CCV settled 160 thousand transactions per day on average for a daily average amount of nearly 13 billion pesos. Considering that during the same period in 2013, the daily average was 145 thousand transactions for a daily amount of 18.5 billion pesos, there was an increase of 10.0

[72] The CCV is the central counterparty responsible for transactions and settlement of foreign and domestic stock, as well as warrants undertaken within the BMV. As a central counterparty, its core function is to assume, by means of novation, the role of reciprocal creditor and debtor of rights and obligations stemming from previously agreed transactions among participants; it also contributes to the mitigation of risks derived from such obligations.

percent in the number of transactions and a fall of 30.4 percent in value (graph 81a). As for the CCV's safety network, as of last June, the contribution fund amounted to 2.188 billion pesos, the compensation fund to 106 million pesos, and the CCV's reserve and capital fund to 104 and 283 million pesos, respectively (graph 81b).

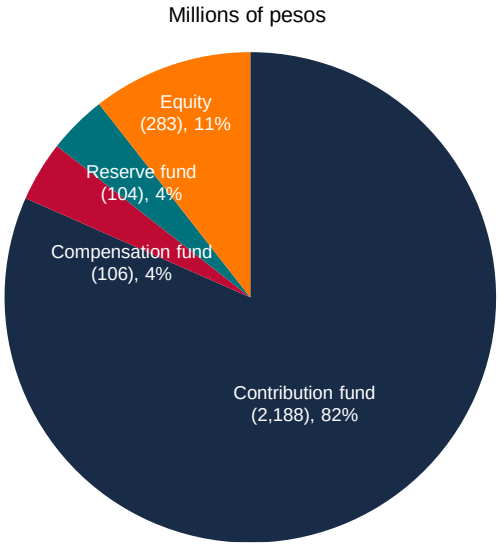
Graph 81
Central Securities Counterparty (CCV)

a) Number of transactions and value (daily average)



Figures as of June 2014
Source: CCV

b) Safety network funds



Figures as of June 2014
Source: CCV

c. *DALI*.[73] DALI uses an algorithm that regularly clears and settles groups of transactions and links the delivery of securities to the corresponding payment; that is, it follows the delivery versus payment methodology (*DvP*)[74] –as a result, DALI is not considered to incur credit risk. Nevertheless, if DALI did not settle a payment instruction, participants might suffer liquidity problems, given the importance of such securities or cash to settle other transactions. DALI is regulated, supervised and overseen by the CNBV and Banco de México.

[73] DALI, a system operated by S.D. Indeval, facilitates the registration and custody of securities deposited in the aforementioned institution, as well as the settlement of direct and repo sale and purchase transactions, securities transfers and loans. Further, DALI manages the collection of interests, dividends and amortizations, and the exchange, conversion, subscription, merger, segregation and reconstitution of securities.

[74] The algorithm runs every two minutes at the most. That way, like in a real time system, unsettled transactions do not accumulate and risks are reduced.

DALI has mainly focused on aspects relating to operational risk management, as well as on setting forth comprehensive policies for general risk management.

d. *SPEI*.[75] With regard to SPEI's compliance with principles, in June 2013, Banco de México carried out a self-evaluation of such platform on the basis of CPMI and IOSCO methodologies.

Such self-evaluation exercise served to identify several opportunity areas: i) the preparation of a document that includes information about security and efficiency objectives (Principle 2); ii) the documentation of policies for comprehensive risk management (Principle 3); iii) the documentation of methodology to determine operating costs (Principle 15); iv) the strengthening of the operational continuity plan (Principle 17); v) the formalization of the oversight procedure for continuous compliance with platform participation requirements (Principle 18); and vi) the analysis and disclosure of results from SPEI evaluation (Principle 23). Consequently, a plan was designed to address all the aforementioned objectives. Banco de México expects to complete most of the tasks outlined in the work plan by the end of 2014 (Principles 23, 15 and 18), and the remainder by the third quarter of 2015 at the latest (Principles 17 and 23).

4.2.2 Payments via Mobile Devices

The widespread use of electronic transfers has been constrained by certain factors, such as bank product prices and lack of internet access. Nevertheless, the increasing use of mobile phones and their adaptability as channels to bank accounts for the purpose of making payments and purchases, offers an excellent opportunity to bring more people into the formal banking system and broaden electronic payment services.

Given the existing domestic technological infrastructure,[76] financial authorities have promoted an appropriate regulatory framework to enable the use of mobile devices, both for opening accounts and making electronic payments.

[75] The SPEI is a system operated by Banco de México which enables real-time transfers. It processes payments from its participants −whether banks or non-bank financial institutions−, its participants' customers, the federal government and settlements related to CLS transactions in pesos. The SPEI does not require credit links between parties, and thus, it exclusively settles a payment when its originator has enough funds; otherwise, the transaction remains pending until the originator has funds. That is the reason why the SPEI does not engender further risks to the financial system.

[76] According to the Federal Telecommunications Institute, at the beginning of 2014, there were more than 100 million mobile phone subscriptions in Mexico, whereas according to CONAPO data, in December 2013, Mexico had more than 118 million inhabitants, which equals nearly one mobile phone per inhabitant.

One of the advantages of payments via mobile devices is that they reduce the need for additional infrastructure, which could be costly – aside from other benefits, e.g., mobility, security and ease of operation.

With the purpose of boosting mobile payments, Banco de México is promoting amendments to existing regulation, so as to improve competition and thus favor interoperability between mobile transfer schemes. Consequently, in 2013, a number of provisions aiming at fostering and facilitating mobile transfers were launched.

4.2.3 Reform to the Transparency and Financial Services Arrangement Law (LTOSF) with Respect to Clearing Houses and Payment Means Networks

As a result of recent financial reforms, including the amendments to the LTOSF which grant powers to Banco de México to regulate clearing houses, the central bank −with prior CNBV's opinion− has issued general provisions to regulate the organization, functioning and operation of clearing houses for card payments. Such regulation aims at: i) fostering competition in the payment processing market, where participation of companies known as processors is highly relevant –these are entities specialized in providing processing services to both issuing and acquiring banks; ii) precluding entry barriers, price distortions and lack of transparency in prices; iii) promoting innovation, by eliminating obstacles to development which may hinder improvements to infrastructure and operation; and iv) bolstering security and risk management within clearing houses.

Furthermore, Banco de México and the CNBV have jointly issued general provisions to regulate, first, the terms and conditions under which services relating to payment means networks shall be provided; and second, interbank fees and other commissions directly or indirectly charged by participants referred to in the Payment Systems Act.

The regulation of the aforementioned networks, fees and commissions sets forth principles for promoting competition, the efficient operation and development of infrastructure, the reduction of fees and charges, free access, and the protection of customers' interests, for the benefit of payment means users and the commercial establishments where such means are used.

5. Stress Tests

This chapter presents the results from stress tests performed by Banco de México to assess banks and brokerage firms' resilience to severe, albeit plausible, exogenous shocks to current risk factors. Through the simulation of stress scenarios of varying stringency, the level of losses that both the overall system and banks and brokerage firms might suffer was estimated. These tests follow a methodology different from CNBV's tests, and thus, complement them.[77] The CNBV must take actions in the event that stress test results categorically show that an entity might have a capital shortfall.

The stress scenarios are strictly theoretical; therefore, they do not reflect expectations over the level or trajectory of actual financial and economic variables. Scenarios were built on the basis of a macroeconomic model that includes both domestic and foreign variables,[78] as well as three submodels or satellite models which use some of the forecasts generated by the macroeconomic model as inputs.

The first satellite model shows changes in interest rate curves, based on shocks generated in the macroeconomic model; the second was used to determine delinquency rates and credit growth by sector, i.e., commercial, consumer and housing loans, on the basis of macroeconomic variables too. This allows the estimation of potential losses in the loan portfolio for every stress scenario of the third submodel. The third satellite model is also used to estimate reserves, the granting of new loans and the evolution of non-financial net income for every bank.

The effect of initial scenarios on intermediaries' market positions were evaluated at the first stage. If any given intermediary exhibited losses that pushed their capital adequacy levels below the regulatory minimum, a contagion process that might affect other intermediaries was triggered. Once possible market and contagion losses were determined, diverse scenarios would then be projected over a 36-month horizon in order to estimate the potential impact on banks' loan portfolios, equity and profits.[79] For this purpose, a number of scenarios were generated, in which shocks were gradual and one variable progressively grew until reaching a critical value.[80]

Results show that banks and brokerage firms would generally maintain reasonable solvency levels. Nonetheless, market stress

[77] The methodologies used by the CNBV for stress tests are available in the FSB Annual Report March 2013, while Banco de México's methodology may be consulted in its *Financial System Report.*

[78] A vector autoregressive model was used. See box 5 in *Financial System Report 2013*.

[79] For this year estimates, in this last stage, losses were modeled on the basis of default rates, so that they would vary by scenario.

[80] For instance, gradual increases in US interest rates of up to 400 basis points on average. Given the uncertainty over the US monetary policy normalization process, this gradual increase of up to 400 bp has become a routine exercise for various organisms, such as the Financial Stability Board (FSB).

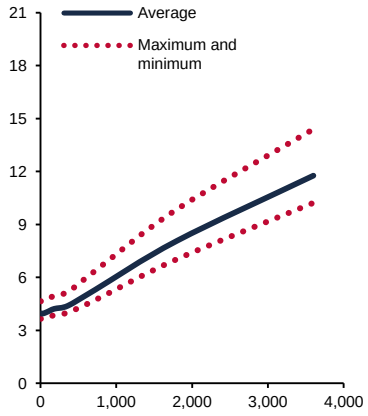
tests suggest that, in extreme albeit plausible scenarios, some financial institutions may suffer significant losses that could put their solvency at stake.Similarly, credit stress tests results show that the system could maintain capital adequacy leves above the regulatory mínimum, although certain institutions displayed capital adequacy ratios lower than the regulatory mínimum of 10.5 percent, and even below 4.5 percent.

Macroeconomic-Based Stress Scenarios and Sensitivity Tests

Given current circumstances, the major potential risk in the financial system could stem from a financial market reaction to a disorderly normalization of US monetary policy. Once the Fed completes its asset purchases, there wil be expectations of sequential hikes in reference rates. If these increases occurr in a disorderly manner, they may have adverse effects on capital flows and the Mexican financial system. Based on this framework, three group of scenarios with different values in risk factors were projected. The inherent difficulties to accurately predict the performance of the main variables led to the consideration of a better alternative, i.e., the simulation of a relatively big number of scenarios. This not only refines the analysis but also enables a more credible assessment of general trends and distributions.

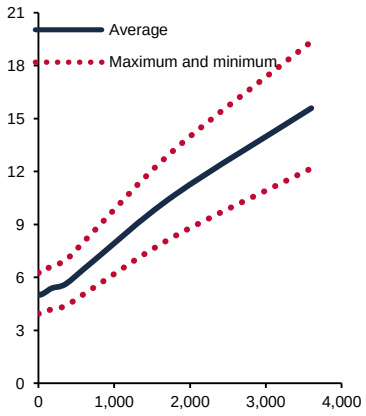
Graph 82
Interest Rate Curves in Mexico and Distribution of US Long-Term Interest Rates

a) Mexican interest rate curves in group 1



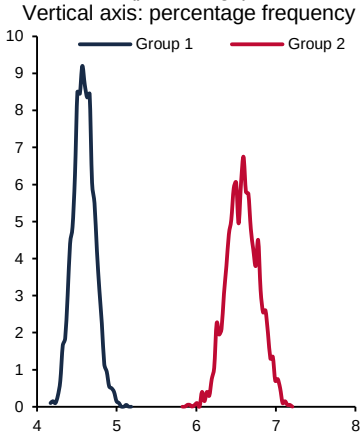
Figures as of June 2014
Source: Banco de México

b) Mexican interest rate curves in group 2



Figures as of June 2014
Source: Banco de México

c) Distribution of US 10-year Treasury bond interest rate



Figures as of June 2014
Source: Banco de México

For the first group of scenarios[81] (group 1), we assumed that the increases in short- and long-term interest rates would have a modest immediate effect on domestic variables, although it would be more signicant within a few months. For the second group of scenarios, the effects of US interest rate hikes would be more severe[82] (group 2), with a view to assessing the vulnerability of the Mexican system to extreme market shocks (graphs 82 and 83). Since banks and brokerage firms' market risk sensitivity is higher when long-term interest rates go up, the effect of such increase was analyzed in greater detail.[83]

Table 11
Descriptive Statistics for the Main Variables in the Two Market Stress Scenarios: One-Month Changes

		Group 1		Group 2	
	Value as of June 2014	Maximum critical value	Average	Maximum critical value	Average
28-day Cete rate 1/	3.02	4.62	3.89	6.20	5.01
Exchange rate 2/	12.98	14.14	13.45	16.00	15.00
IPC	42,737	33,931	37,313	32,957	37,422
IGAE 3/	2.5	-0.2	1.0	-2.7	-0.6
Unemployment rate 1/	4.9	5.3	4.7	5.3	4.7
10-year US Treasury bond rate 1/	2.53	5.12	4.59	7.17	6.58
3-month US Treasury bond rate 1/	0.02	1.58	1.04	3.06	2.06
Inflation 1/	3.8	4.7	4.2	5.0	4.4

Source: Banco de México
The stress scenarios are strictly theoretical; therefore, they do not reflect expectations over the level or trajectory of actual financial and economic variables.
1/ Percent
2/ Pesos per US dollar
3/ Percentage change

Last, for the third group of scenarios[84] (group 3), we considered gradual increases in US interest rates; the projection of this group of scenarios over a 3-year horizon was used to perform credit stress tests.

[81] The first group of scenarios is based on a context of US interest rate hikes and changes in Mexican variables of one and two standard deviations.

[82] The group of highly stringent scenarios is consistent with a context of higher US interest rates and a recession in Mexico.

[83] The immediate effect of changes in US short-term interest rates on the exchange market position is relatively negligible. Nonetheless, in order to fully assess stress in such position, changes in long-term interest rates should be analyzed, as they imply potentially more severe losses.

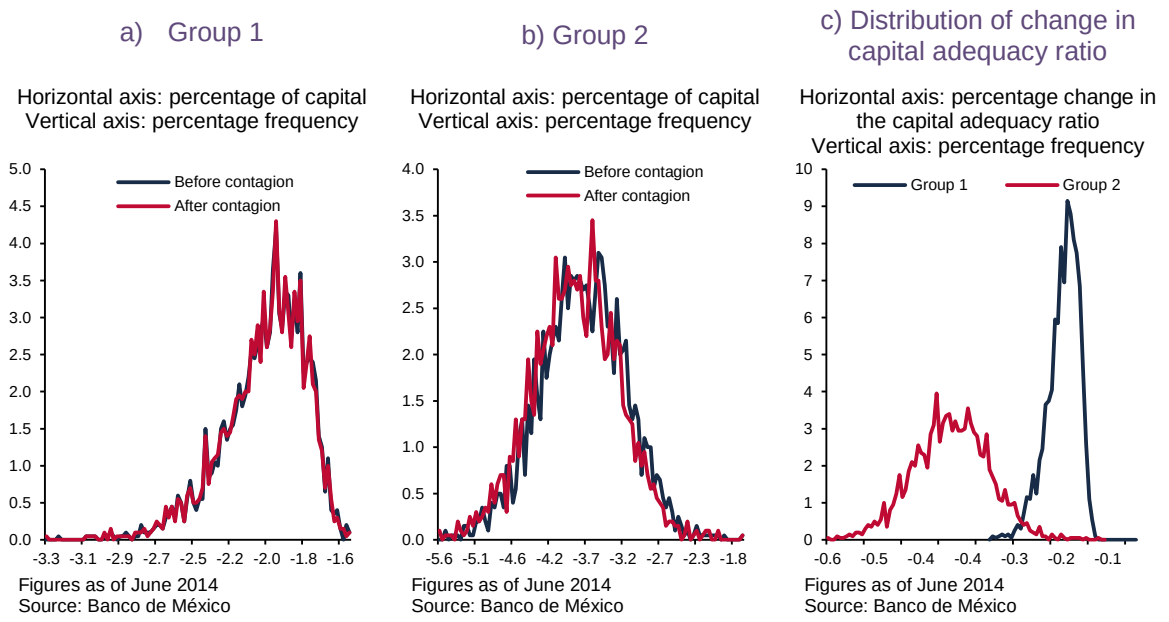
[84] This last set of scenarios involves actually a gradual release of up to 400 basis points average of US long-term interest rates and the consequences of the increase in the main variables of Mexico. The effects of this scenario on the market position of the banks themselves were calculated but not reported, because the magnitude of the effect was relatively small. However, considering the evolution of the main variables after 12 months, the predicted values in the set 3 are similar to those of the set 2.

Market Stress

At a first stage, we evaluated the effect of the first two groups of scenarios on brokerage firms and banks' market positions over a one-month time horizon. Next, we generated an initial loss distribution for such institutions and the system as a whole. Since the first estimated impact could affect some institutions' solvency, and hence, there would be room for a contagion process that might exacerbate losses in the system, we generated a second loss distribution.

Losses in the system during the contagion process in group 1 scenarios could represent on average 2 percent of banks and brokerage firms' capital. These losses would not significantly increase in the wake of the contagion process (graph 83a).[85]

Graph 83
Loss Distributions as a Proportion of Net Capital Before and After Contagion



Figures as of June 2014
Source: Banco de México

Figures as of June 2014
Source: Banco de México

Figures as of June 2014
Source: Banco de México

In group 2 scenarios, losses would on average account for 3.7 percent of capital. These loss levels would not be enough to unleash a significant contagion process, as they would only impinge on some small-sized intermediaries' solvency, to whom other intermediaries would not be significantly exposed. Distributions before and after contagion were therefore similar (graph 83b).

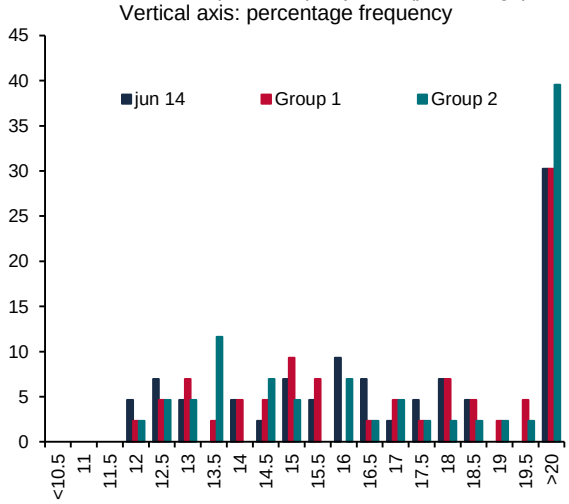
[85] The limited contagion effect observed is partly due to the fact that the interbank risk position matrix employed in these exercises did not contain a significant number of institutions with relevant exposures to a single counterparty (see *Contagion* section in Chapter 2 *Assessment of Financial Stability*).

The system's ability to absorb losses depends on its intermediaries' adequate capitalization levels. Even in more stringent stress scenarios (group 2), the system's capital adecuacy levels did not register relevant changes (graph 83c). Nevertheless, the effects of market shocks vary significantly among institutions: in the aforementioned scenarios, although some intermediaries' capital adequacy ratios could drop by more than 2 percent, other intermediaries' market positions could benefit therefrom, and, consequently, their capital adequacy levels would go up (graph 84).

Graph 84
Performance of Capital Adequacy Ratio and Capital Consumption Ratio

a) Distribution of average capital adequacy ratio for banks as of June 2014 (groups 1 and 2)

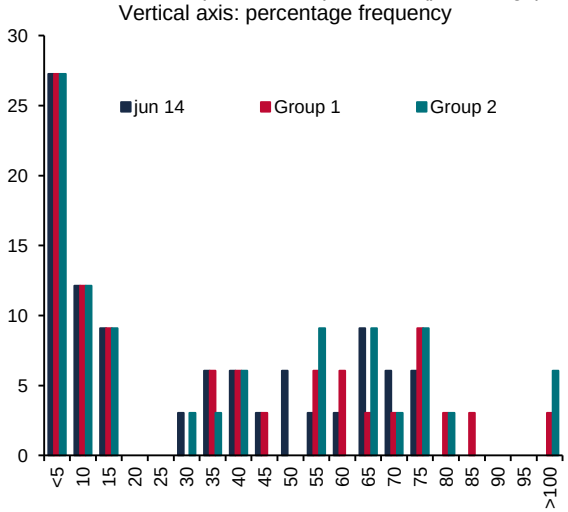
Horizontal axis: capital adequacy ratio (percentage)
Vertical axis: percentage frequency



Figures as of June 2014
Source: Banco de México

b) Distribution of average capital consumption ratio for brokerage firms as of June 2014 (groups 1 and 2)

Horizontal axis: capital consumption ratio (percentage)
Vertical axis: percentage frequency



Figures as of June 2014
Source: Banco de México

Market stress tests show that the highest impact is linked to changes in Mexican interest rates. As seen in graph 82, the curve is steeper for group 2, having a larger effect on banks with a higher exposure to interest rate risks. Further, a mere increase in US long-term interest rates would not be enough to unleash losses; it would have to be matched by an unfavorable domestic context to trigger such a negative effect.

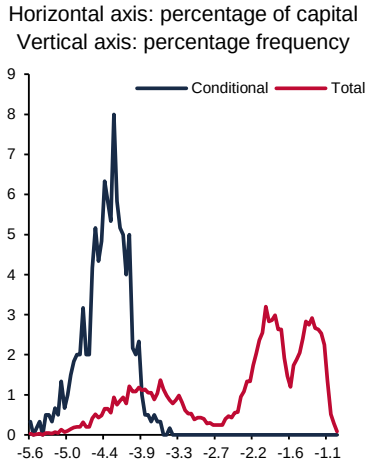
On the other hand, the model employed to generate the scenarios also made it possible to identify which variables could trigger the biggest losses in the financial system. Hence, for every variable, we selected a subset of scenarios in which they displayed their most extreme levels. It was then possible to generate the system's conditional loss distribution for every subset of scenarios. Results suggest that for most projected variables, losses would on average be higher than two percent of net capital (graph 85).[86] These results

[86] For further reference, the graphs include the total distribution of losses in the system.

hint at the strength and hererogeneity of Mexican institutions; yet, some intermediaries could indeed exhibit capital adequacy levels below the regulatory minimum.

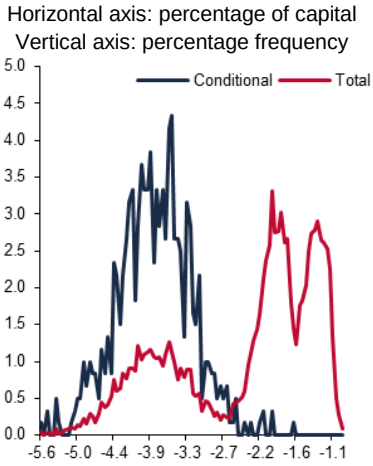
Graph 85
Conditional Loss Distributions as a Proportion of Net Capital

a) Domestic interest rates



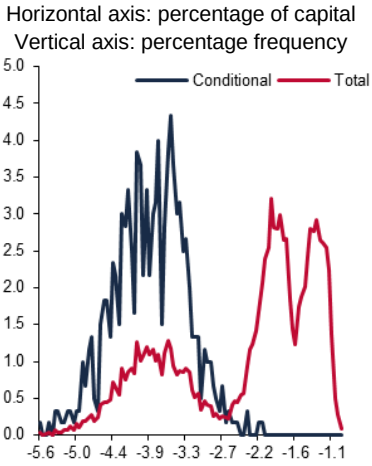
Figures as of June 2014
Source: Banco de México

b) GDP growth



Figures as of June 2014
Source: Banco de México

c) US Treasury 10-year bond rate



Figures as of June 2014
Source: Banco de México

Credit Stress Tests

There are two highly significant variables for credit stress tests: the default rate and actual observed losses in case of default, which are inversely related to the recovery rate. Accordingly, for this year's analysis, we modeled both variables.[87,88] The rest of the analysis followed the same steps as in previous years. Thus, the effects of these simulations were measured via the changes in non-performing loans, reserves, monthly net profits, equity and risk weighted assets.

For this exercise, we developed the 36-month trajectories for different risk factors resulting from the shocks proposed in group 3 scenarios (table 12). With initial shocks, we calculated banks' losses in their

[87] For this report, apart from the explicit modeling of loss given default (LGD), the computation of banks' income and expenses was further refined, and we also included the individualized transfer of interest rate changes using rates charged by banks in their different portfolios (commercial, housing and consumer).

[88] Loss Given Default (LGD) was calculated using the Vasicek model to estimate default rates. Based on this methodology's assumptions, we came up with an explicit LGD function on the basis of default rates. Other modeling strategies that typically depend on regression analysis or other empirical methods are not very effective for short data series, like Mexican data. That is why we decided to build the recovery rate function based on its theoretical formula. See *The simple link from default to LGD*, Jon Frye, Risk, March 2014.

own market portfolios and resulting from the contagion effect.[89] For subsequent months, we applied shocks to the default rate, the current loan portfolio's growth rate and interest rates for every period. Twenty-two banks were considered, which account for more than 90 percent of the system's assets and 98 percent of the loan portfolio.[90]

Table 12
Descriptive Statistics for the Main Variables in Credit Stress Scenarios

		After 12 months		After 24 months		After 36 months	
	Value as of June 2014	Critical value min or max	Average	Critical value min or max	Average	Critical value min or max	Average
28-day Cete rate 1/	3.02	9.05	5.91	10.79	8.62	11.08	8.31
Exchange rate 2/	12.98	20.01	17.79	25.41	22.22	27.58	24.19
IPC	42,737	30,319	51,636	45,954	57,394	66,707	71,630
IGAE 3/	2.5	0.1	1.1	-5.0	-2.8	-3.2	2.6
Unemployment rate 1/	4.9	6.7	5.8	7.1	6.1	7.0	6.0
10-year US Treasury bond rate 1/	2.53	8.26	6.65	8.36	6.07	7.61	5.81
3-month US Treasury bond rate 1/	0.02	2.62	1.98	3.13	2.30	3.11	2.12
Inflation 1/	3.8	9.2	7.1	14.3	10.9	14.8	11.1

Source: Banco de México
The stress scenarios are strictly theoretical; therefore, they do not reflect expectations over the level or trajectory of actual financial and economic variables.
1/ Percent
2/ Pesos per US dollar
3/ Percentage change

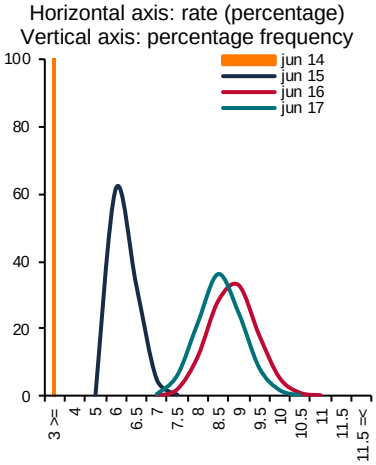
Graph 86 shows both the performance and level of some of the analyzed variables. The initial shock effects can be seen in higher interest rates that in turn generate higher income for banks. As time goes by, higher interest rates and the evolution of other variables increase the default and delinquency rates (graphs 87a and b), which in turn bring about higher loan loss provision expenses for banks. Additionally, the pace of growth of new loans slows down, and this also affects income; however, since the loan portfolio has compressed, losses associated with a higher default rate also grow at a slower rate.

[89] As mentioned before, market position losses are indeed calculated and taken into account; nevertheless, they are not reported, since initial shocks are relatively smaller and the ensuing losses (or gains) are relatively inconsiderable too.

[90] Banks with insufficient historical data were not included in the 36-month forecast.

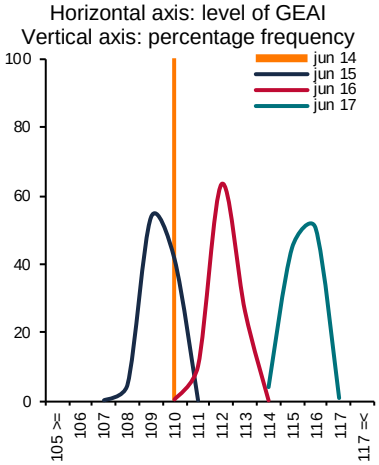
Graph 86
Distribution of Variables in Different Scenarios

a) 28-day Cete rate



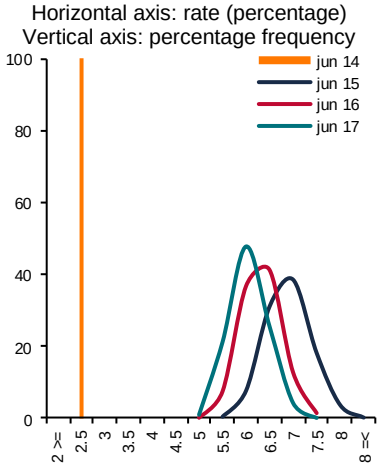
Figures as of June 2014
Source: Banco de México

b) Global economic activity indicator



Figures as of June 2014
Source: Banco de México

c) US Treasury 10-year bond rate



Figures as of June 2014
Source: Banco de México

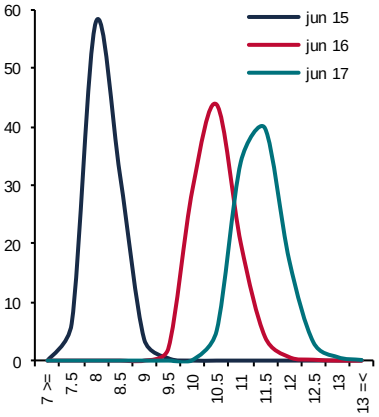
According to stress test results, the system's capital adequacy ratio would fall by 4.5 percentage points on average–for the initial capital adequacy ratio to remain the same, all banks taken together would need around 212 billion pesos in capital.[91] Although, on average, the system would not face solvency problems in most scenarios, at an indivual level, some banks' capital adequacy ratios would drop below the required minimum of 10.5 percent (graph 88).

[91] For the calculation of capital needs, we selected the capital and risk-weighted assets from the scenario with the closest capital adequacy ratio to average level. Thus, capital needs are equivalent to the difference between the initial capital adequacy ratio and the capital adequacy ratio in such final scenario multiplied by risk-weighted assets in said scenario.

Graph 87
Performance of Income and Delinquency Rate in Group 3 Scenarios

a) Distribution of average delinquency ratio

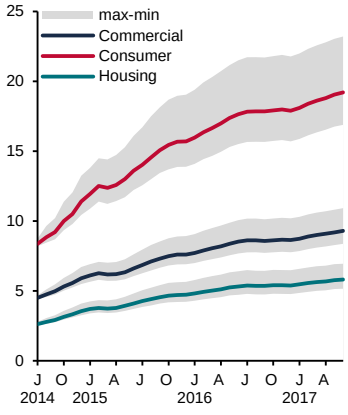
Horizontal axis: default rate (percentage)
Vertical axis: percentage frequency



Figures as of June 2014
Source: Banco de México

b) Average defaut rate by type of loan

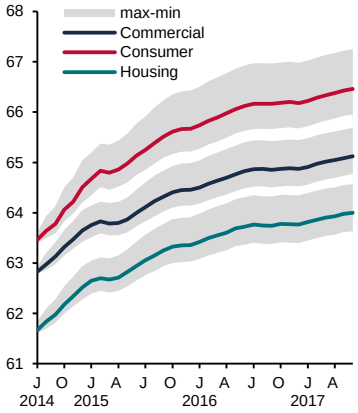
Percent



Figures as of June 2014
Source: Banco de México

c) Loss Given Default

Percentage of portfolio

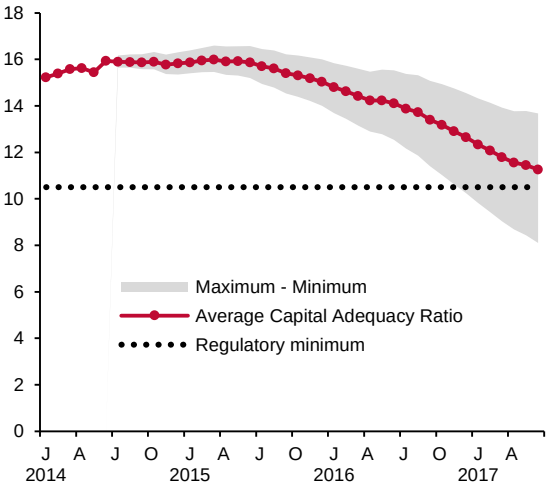


Figures as of June 2014
Source: Banco de México

Graph 88
Performance of Capital Adequacy Ratio

a) Performance of capital adequacy ratio in group 3 scenarios

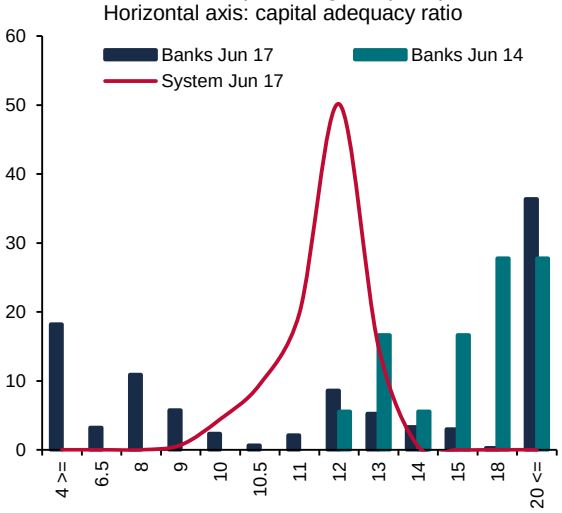
Percent



Figures as of June 2014
Source: Banco de México

b) Distribution of average capital adequacy ratio at the beginning and at the end of stress scenarios

Vertical axis: percentage frequency
Horizontal axis: capital adequacy ratio

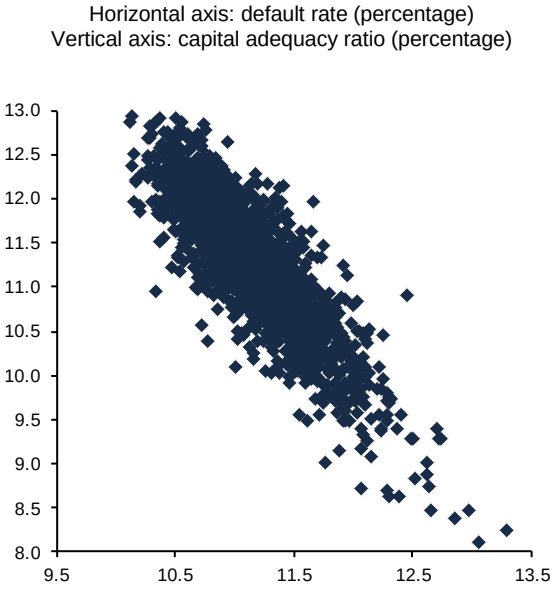


Figures as of June 2014
Source: Banco de México

With the purpose of determining which macrofinancial variables would have the greatest impact on the system, in terms of capital adequacy levels, a distribution of the system's capital adequacy ratio was generated, on the condition that the variable in question recorded the highest (in the case of rates) or the lowest values (in the case of economic growth). Domestic interest rates were the variables whose extreme values brought about the worst results for the system (graph 89b). Furthermore, the design of the stress tests allows the assessment of shock effects on institutions; results indicate that some entities would remain below the regulatory minimum in all scenarios. Nevertheless, at an aggregate level, commercial banks' solvency would not be at risk in most simulated scenarios. After 36 months of continuous stress, the capital adequacy ratio would end up, on average, 76 basis points above the required minimum.

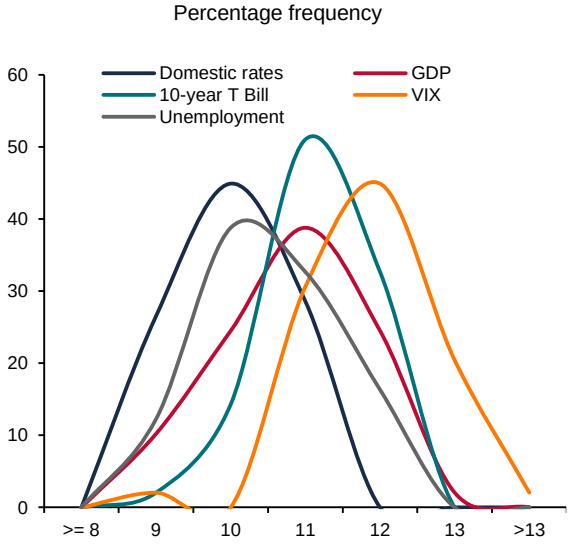
Graph 89
Results After 36 Months of Stress

a) Relationship between the system's capital adequacy ratio and default rate at month 36



Figures as of June 2014
Source: Banco de México

b) Distribution of banks' capital adequacy ratio in the 50 worst-case scenarios



Figures as of June 2014
Source: Banco de México

6. Balance of Risks and Conclusions

This last chapter presents the balance of risks based on the analysis presented in this document of domestic financial stability and major actions undertaken by financial authorities. It also presents a summary of key conclusions.

6.1 Foreign Risks

An Abrupt Reversal of Capital Flows

Although the normalization of monetary policies in advanced countries is expected to be gradual, the risk persists that such process might trigger abrupt reversals of capital flows between advanced and emerging countries. Accommodating monetary policies in the aftermath of the crisis have significantly increased funds channeled through debt and capital markets to different sectors and countries, in coincidence with a slowdown in banking activity in developed countries. This singular outlook certainly poses a number of challenges in terms of financial stability. Global investors in financial instruments are generally more sensitive than banks to the performance of interest rates and exchange rates. Even though the amount of global funds passively managed by institutional investors has grown in recent years, most funds invested in emerging economies' financial assets are actively managed. That is why the monetary policy normalization process may substantially increase the volatility of major financial variables. Certainly, there are other factors that may reinforce the impact on financial markets of the economic agents' reaction to the aforementioned normalization process; namely, the use of similar methodologies to assess risk (VaR), the way in which fund managers' results are interpreted, the decompression of risk premia from record lows, as well as the features of some collective investment tools. All of the above mentioned factors could bring about disorderly and abrupt reversals of capital flows. Similarly, an unexpectedly faster US economic recovery that pushed up inflation beyond projections, the further worsening of Chinese economic activity or the escalation of geopolitical risks may also trigger a sharp reversal of capital flows in the emerging world.

The Worsening of Imbalances Derived from the Excessive Prolongation of the Monetary Stimulus

The search for yield and the compression of risk premia have not only increased financial vulnerabilities both in advanced and emerging economies, but also heightened the global financial system's sensitivity to interest rate changes. Although global returns were already diminishing before the onset of the 2008 financial crisis, the prolongation of the lax monetary stance in developed countries has played a part in increasing global systemic risk both within and outside the regulated financial system.

In principle, macroprudential policies may have a significant role in curbing systemic risk and increasing the financial system's resilience to a variety of shocks. Nevertheless, their scope is limited since, among other reasons, they are only directly applied via the regulated financial system. It appears as if markets were not sufficiently discounting the heightened global risks caused by the protracted monetary stimulus, and that investors were not taking steps to properly hedge their positions. In consequence, were central banks in developed countries to indefinitely extend the monetary stimulus, financial vulnerabilities would foreseeably continue to rise. And in that case, a sharp interest rate adjustment in the future could have longer and harsher repercussions. Although the impact of said risks could be mitigated by prudential measures and adequate oversight, it is also true that the way these funds are being channeled towards emerging economies (via debt and stock markets and not through banks) hampers the efficiency of traditional macroprudential policies.

Global Economic Activity and Geopolitical Risks

The recent trends in international financial markets confirm that agents have become highly sensitive to information and events that impinge on global confidence. Hence, the weakening of the global economic recovery poses an additional risk to financial stability, which stems not only from its direct effects on growth but also from international financial markets' reaction. It is worth mentioning that although the main reasons for concern relate to poor economic activity in continental Europe, the figures of other developed countries are also drawing attention, e.g. expectations over the US recovery. A global economic slowdown may also deepen the downward revision of oil prices and thus increase risks to exporting countries.

In parallel, geopolitical risks that may have considerable repercussions on trade, economic activity and commodity markets have substantially grown over the last months. The sectarian conflict in the Middle East and the escalation of the Ukrainian crisis are the major sources of unrest. The former might affect energy prices in the short term, whereas the latter may also have an effect on energy prices, especially in Europe. The economic sanctions imposed on Russia by the US and the European Union, as well as economic

retaliation announced by the former are not good news for a global economy still struggling to gain traction.

The escalation of geopolitical risks would not only have a direct impact on the global economy, but could also trigger new bouts of volatility in international markets –especially, the price of high-risk assets like those of emerging economies with macroeconomic imbalances could be hard hit.

6.2 Domestic Risks

A Possible Economic Slowdown

At a domestic level, a weak economic recovery represents the biggest threat. For various reasons, the occurrence of such situation would make the financial system more vulnerable to both foreign and domestic shocks. First, the ability to stand out among emerging economies would be hampered, and thus, the effects of international interest rate hikes could be greater. Second, lower-than-projected growth, both in size and duration, would deteriorate the fiscal situation. Moreover, this would coincide with an anticipated upward revision of international interest rates. Third, this would exacerbate the further deterioration of banks' loan portfolio. Nonetheless, during the second half of 2014, economic activity has by and large picked up steam; further, despite ups and downs, available data as of the third quarter of the year confirm the recovery. Therefore, the expectations are that a strengthened foreign demand, a countercyclical fiscal policy, the additional monetary stimulus already applied by Banco de México –in line with its inflation target−, and the realization of the benefits derived from recent structural reforms will contribute to refueling the incipient recovery.

Risks Posed by Low Interest Rates

As in any country, the persistence of low interest rates in financial markets generates risks that may affect the financial system in many different ways. Low interest rates matched by weak economic activity have squeezed credit institutions' financial margins. If protracted, this situation could increase entities' risk-taking positions and impinge on their ability to replenish capital in case of shocks. Last, low interest rates have also led non-financial companies to issue debt denominated in foreign currencies; they are consequently exposed to new risks. Although available data suggest that such exposure is limited, more detailed and timely information is necessary to corroborate that risks are being properly hedged.

Consumer Credit Growth

In Mexico, bank credit as a proportion of GDP is significantly lower than in other emerging economies. Nevertheless, if credit components are broken down, certain niches are of concern, such as non-revolving credit, especially personal and payroll loans, which have exhibited high growth and delinquency rates. It is imperative that banks commit to the cautious origination of consumer loans and evaluate their customers' financial position in order to prevent over-indebtedness and a surge in defaults. Importantly, the pace of growth of the consumer loan portfolio continued to moderate and this is to be welcomed. Nevertheless, banks must follow up closely the performance of this segment. There has been a series of credit events in recent years resulting from both poor origination processes and lack of adequate bank controls. As for payroll loans, banks compete to draw new customers' accounts, disregarding their debt with the banks that originally managed their payroll and granted them loans. In relation with mortgage loans, although origination standards have been maintained and delinquency remains at manageable levels for banks, the flexibility introduced by mortgage subrogations calls for the careful monitoring of several factors, i.e., housing prices, mortgage credit growth, the offer of new mortgage-backed products, and banks' and other intermediaries origination standards. All this, for the timely detection of both price increases far from standard levels and households' excessive leveraging derived from house purchases

Policies and Actions

Mexico stands out among emerging economies thanks to long efforts made to integrate the Mexican economy and financial system into the global economy, and thus increase its growth potential. As part of this global insertion strategy, domestic financial and economic authorities have implemented foreseeable and transparent policies and actions, in line with market economy principles.

The 1995 crisis demonstrated that the benefits from capital mobility could be better exploited with a free-floating exchange rate regime, as it allows the orderly and timely adjustment of foreign accounts to a variety of shocks. In addition, Mexican fiscal policy has been prudent,

aiming at bringing economic growth as close as possible to its potential level, and without compromising the sustainability of public debt. On the other hand, monetary policy has focused on price stability.

Moreover, considering the aforementioned risks, authorities have been implementing a number of measures to bolster the soundness of the domestic economy and increase the financial system's resilience to a variety of shocks. Hence, the federal government has taken advantage from the liquidity in international financial markets to extend public debt terms and cut its costs. In regard to risk management, a number of financial hedging transactions have been undertaken to cushion the effects of changes in energy prices; namely, the creation of the Mexican Oil Fund for Stabilization and Development earlier this year, which aims at channeling the surplus from oil sales to stabilize public revenues and thus be in a better position to deal with adverse shocks in the future.

Another factor that sets the Mexican economy apart from other emerging countries is the strength of its financial system before, during and after the international financial crisis. However, this is not a matter of chance, but rather of continuous efforts over a long period of time to increase the amount and quality of capital. Even so, financial authorities have been adopting a series of measures to enhance the financial system's resilience to adverse shocks, including most notably the following: limits on transactions between parent and subsidiary companies in order to curb contagion potential; measures to foster data availability and transparency with regard to the situation of non-financial companies issuing debt; and more recently, limits on the leveraging of instruments not subject to traditional banking regulation.

Furthermore, financial authorities are already working to bring all of the Basel Committee capital and liquidity standards into the corresponding regulation. Work is also being done to strengthen financial infrastructures.

6.3 Conclusions

Since the publication of the previous *Report*, the environment faced by the Mexican financial system has substantially changed. Although during late 2013 international financial markets exhibited low levels of volatility, largely thanks to the effectiveness of advanced economies' press releases on monetary policy, as of October 2014, both expectations over the near end of expansionary monetary policies and the weakened European economy brought about significant bouts of volatility.

Such episodes have coincided with an increase in global financial vulnerabilities, of which the following are worthy of mention: lower

liquidity in financial markets, higher leveraging in non-financial sectors, the entry into market of new intermediaries with more lax origination practices, the increased size of the financial sector not subject to traditional banking regulation and the rapid growth of global asset managers. In the event of a disorderly adjustment of US monetary policy target rates, said vulnerabilities would only aggravate its intensity and duration.

Given these circumstances, several countries have been implementing macroprudential policies to mitigate the vulnerabilities faced by their financial systems. And yet, although some of these policies have proved to be effective in curbing bank risks, their scope has been questioned, as, given their nature, they exclude financial entities and transactions not subject to traditional banking regulation. Further, macroprudential policies do not seem to be the proper and adequate tool to contain the international repercussions of lax monetary policies. Taking into account all of the above, the risk of new episodes of volatility in international financial markets remains high.

In this complex international setting, Mexico stands out for its solid fundamentals, which are the result of transparent and foreseeable market-based economic policies −namely, a floating exchange regime and free capital mobility. Furthermore, inflation and the current account deficit are low, while the public sector deficit and indebtedness remain at sustainable levels. Nevertheless, a deterioration of such indicators could hamper the country's ability to stand out among emerging countries, particularly during episodes of weak energy prices and volatility in financial markets.

In the face of upward revisions of international interest rates, it is imperative to preserve an orderly macro-financial environment. For that purpose, a monetary policy that efficiently achieves inflation targets is crucial, as it may reduce uncertainty. Moreover, such monetary policy shall not only take into account the domestic economic performance but also the relative monetary stance *vis-à-vis* the US. It is also important to maintain the current account deficit at moderate levels.

Even though foreign investors have a significant share in the public debt market, this has remained constant despite the bouts of financial volatility registered since May 2003 –this is certainly a reflection of the confidence in the country. Furthermore, the federal government has capitalized on financial markets opportunities to tap less expensive funds and extend debt terms.

Additionally, there are other factors that have had a direct effect on the environment facing the Mexican financial system. Although the timely implementation of financial standards cannot by itself eliminate stress episodes, it does enhance credit institutions' ability to better face those shocks and to recover from them more easily. Thanks to the early adoption of diverse international standards, the domestic banking system as a whole continues to display high liquidity and

capital adequacy levels. And still, some intermediaries must strive to reinforce their solvency and meet the liquidity standards that shall come into force next year. This was confirmed by the results of stress tests performed by Banco de México. In extreme albeit plausible scenarios, some financial institutions might suffer significant losses, which, in worst-case scenarios, could threaten their solvency.

On the other hand, as in other countries, financial activities through markets or entities not subject to traditional banking regulation have grown. The study of this situation suggests that, even though risks are not significant in the short term, these activities may potentially trigger significant vulnerabilities. It is therefore desirable that financial authorities intensify their efforts to increase the information available in the sector, i.e., size and potential risks to financial stability -all this, in order to adopt measures to mitigate risk, without inhibiting financial innovation.

Finally, Mexican non-financial companies have profited from low foreign interest rates to issue debt denominated in foreign currencies. The information gathered suggests that a significant portion of those issuers have used such funds to refinance their liabilities, and that bonds issued have long terms and fixed interest rates. Yet, it is important to get further information in order to corroborate that risks taken are being adequately hedged. On the other hand, available data suggest that the financial position of households is not a matter of concern for the financial system. The international economic environment is expected to improve gradually, with the ensuing reduction of financial vulnerabilities. Also, domestic economic growth is expected to be fueled by the US economic momentum in the short term, and by structural reforms in the medium- and long-term. In the meantime, measures should continue to be taken, aiming at bolstering the financial system's soundness and resilience in the face of volatility episodes. It is also essential to ensure the proper implementation of reforms and to preserve the macroeconomic soundness achieved thus far.