Financial innovations and developments in housing finance in Mexico

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I. Introduction

In recent years, housing finance in Mexico has undergone important structural changes as a result of macroeconomic stability and financial innovations. These innovations have broadened both mortgage credit products and financial intermediaries' funding techniques. In particular, financial innovations have improved households' accessibility to mortgage credit. A stable macroeconomic environment, the increased availability of resources to finance the private sector, and the active role of public sector credit institutions in the mortgage credit market explain the recent mortgage credit expansion and the growing number of households with access to housing finance. However, housing gaps are still large; for instance, the ratio of mortgage credit to GDP is low compared to other countries' indicators. Therefore, there is huge potential for the growth of the mortgage credit market in Mexico.

This document describes and assesses the most relevant developments in housing finance in Mexico. Section II deals with the recent performance of the Mexican economy and the main macroeconomic factors that have supported mortgage credit growth. Section III describes the current structure of both the housing market and housing finance institutions, and shows the importance of public institutions in this market. Section IV presents relevant innovations in: i) the financial system regulatory framework and mortgage credit institutions; ii) funding sources of housing finance; and iii) housing finance products. Section V describes the recent developments in mortgage credit, and also gives a brief assessment of private financial institutions' solvency, mortgage credit delinquency rates, and the mortgage-backed securities market. Finally, section VI presents some conclusions.

II. Recent economic performance of the Mexican economy

This section describes briefly the economic crisis of the mid-1990s and the recent macroeconomic performance of the Mexican economy. First, it highlights the relevance of low and stable inflation and interest rates, the moderate use of financial resources by the public sector, and the process of financial deepening as key elements to support funds availability to finance the private sector. Second, the financial system strength and adequate regulatory and supervisory financial framework also play an important role in the sound performance of credit market.

During the early 1990s, the Mexican economy experienced an important credit expansion. In 1994, commercial bank credit to the private sector reached 34% of gross domestic product (GDP). This episode took place in an environment characterized by poor banking management and weak supervisory and regulatory practices. In the late 1994, as a result of

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a sudden reversal of foreign capital flows, Mexico was forced to abandon the exchange rate peg and adopted a flexible exchange rate regime. As a result, the peso adjusted significantly – from 3.4 pesos per dollar in November 1994 to 7.5 pesos per dollar in November 1995 – and the annual inflation rate jumped from 7.1% in 1994 to 52% in 1995. Economic activity declined sharply, as nominal interest rates increased to levels close to 80%. Under these conditions, households and firms faced difficulties in servicing their loans; thus banks' non-performing credit portfolios increased markedly.

The second half of the 1990s was characterized by fiscal, monetary and exchange rate policies to stabilize the economy and to correct macroeconomic imbalances. In addition, a new set of financial regulations was introduced to strengthen the banking sector's supervisory and regulatory framework.[3] As a result of the crisis, commercial banks' size – measured by total assets – contracted from 76.4% of GDP in 1994 to 63.9% in 2000. For one thing, the banking structure experienced a profound transformation characterized by banking mergers and acquisitions and increasing foreign banking participation. For another, households and firms underwent a period of adjustment in their financial balance sheets, and their credit demand contracted sharply. In 1994, the ratio of commercial banks' credit to the private sector to GDP was 39.5%, compared with 12.7% in 2000. Meanwhile, the ratio of private sector total financing to GPD dropped from 61.8% in 1994 to 30.5% in 2000.

In recent years, the private sector credit market in Mexico has been positively affected by the consolidation of a stable macroeconomic environment, supported by monetary and fiscal policies that have allowed a significant reduction of the inflation rate and subsequently its stabilization. The year-to-year inflation rate, measured by the Consumer Price Index (CPI), dropped from12.3% in 1999 to 3.8% in 2007. Between 2001 and 2007 the average annual inflation rate was 4.3% (Chart 1). Moreover, the implementation of a sound fiscal policy has reduced the absorption of financial resources by the public sector. The public sector balance, measured by the public sector borrowing requirements (PSBR), decreased from 3.4% of GDP in 2000 to 1.3% in 2007 (Chart 2).[4]

The combination of a decreasing inflation rate and narrowing public sector borrowing requirements, among other factors, favored a decline in interest rates. In 2000, the nominal interest rate of federal government three-month bonds (91-day CETES) was, on average, 16.2%. In 2007, the average short-term nominal interest rate was 7.4%. Meanwhile, short-term real interest rates dropped from 7.8% on average in 2000 to 3.8% on average between 2004 and 2007.

In recent years, a stable economic environment, financial deregulation, and the introduction of strategies to broaden the access to the banking system have favored financial deepening.[5] The ratio of total financial savings, measured by the broad monetary aggregate (M4), to GDP increased from 41.7% in 2000 to 55% in 2007 (Chart 3).

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[3] Several financial reforms were implemented after 1995 to promote market discipline: i) establishment of a limit to deposit protection insurance; ii) disclosure requirements were increased to enhance market discipline; iii) credit bureaus; iv) capital adequacy rules; v) elimination of limits to foreign ownership (recapitalization); v) new accounting standards; vi) prudential regulation; vii) corporate governance; and, viii) creation of risk management units (see: J Sidaoui, *The Mexican financial system: reforms and evolution 1995–2005*).

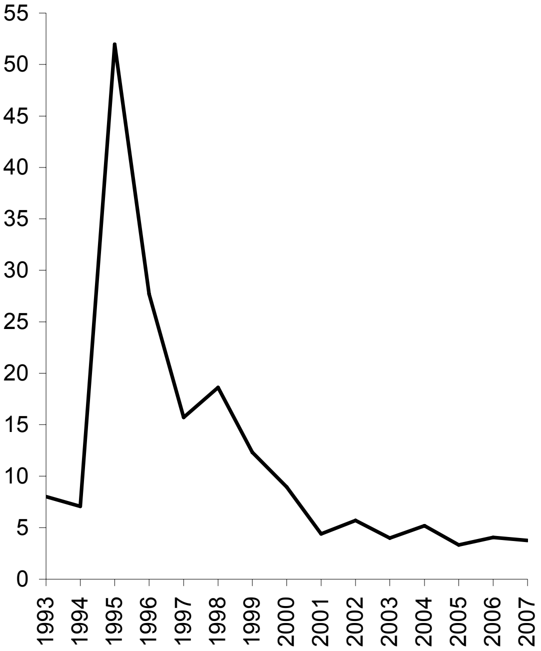
[4] Public sector borrowing requirements (PSBR) measure the financing needs of both public entities and non-public and social entities that act on the government's behalf. PSBR include, among others, i) the traditional public balance; ii) resources channeled to finance the private and social sectors; iii) IPAB's (Mexican deposit insurance corporation) borrowing requirements net of federal government transfers; iv) the financing needs of public investment projects financed by the private sector (PIDIREGAS); and v) the borrowing requirements of the toll road rescue program (FARAC).

[5] The number of banking accounts increased from 22.8 million in 2000 to 47.9 million in 2007. In addition, the number of investment funds accounts was 1.7 million in 2007, 1.2 million more than in 2000. (Source: *Comisión Nacional Bancaria y de Valores*, CNBV).

Chart 1

Inflation rate

Percentage year-to-year

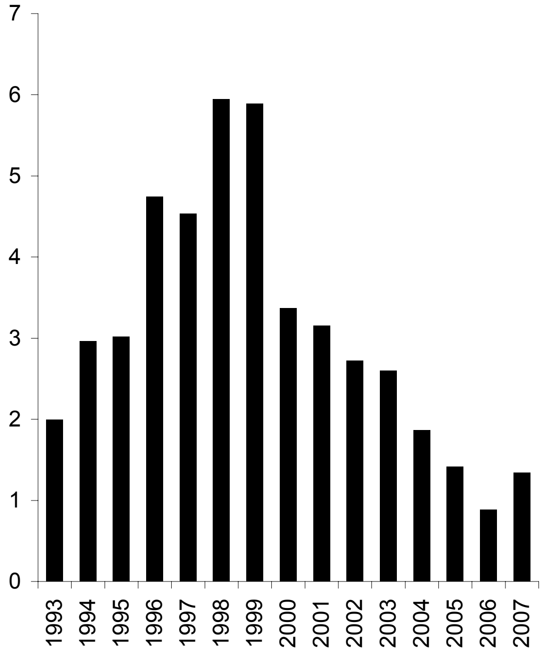


Source: Bank of Mexico.

Chart 2

Public sector borrowing requirements

Percentage of GDP

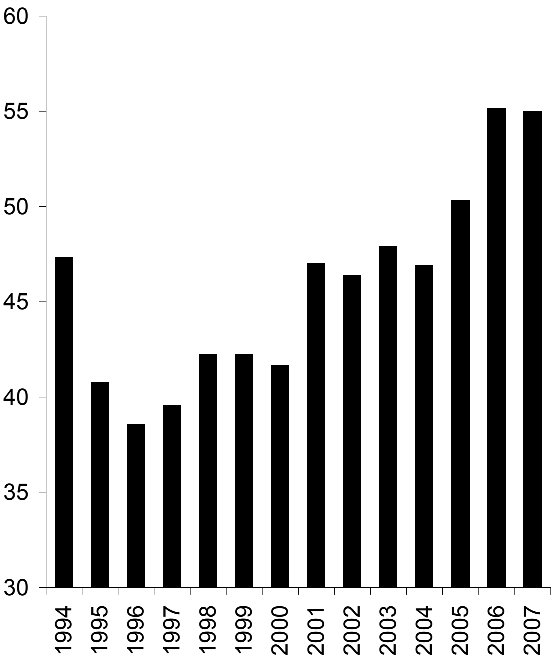


Source: Ministry of Finance (SHCP).

Chart 3

Total financial savings[1]

Percentage of GDP



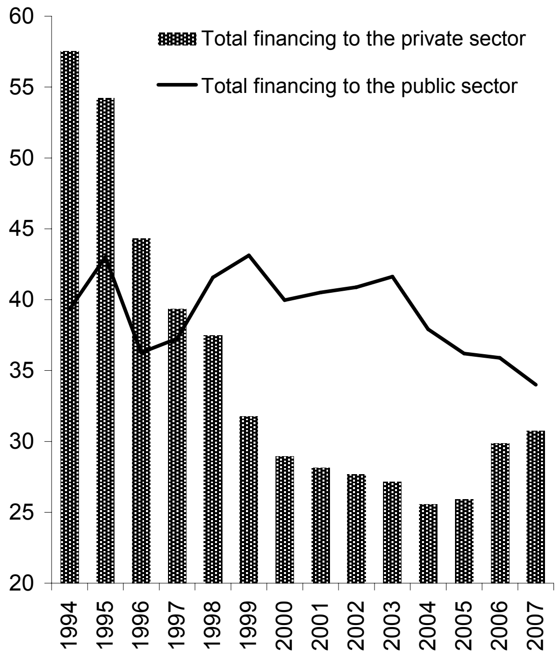
[1] Broad monetary aggregate M4.

Source: Bank of Mexico.

Chart 4

Total financing[2]

Percentage of GDP



[2] Includes domestic and external financing.

Source: Bank of Mexico and Ministry of Finance (SHCP).

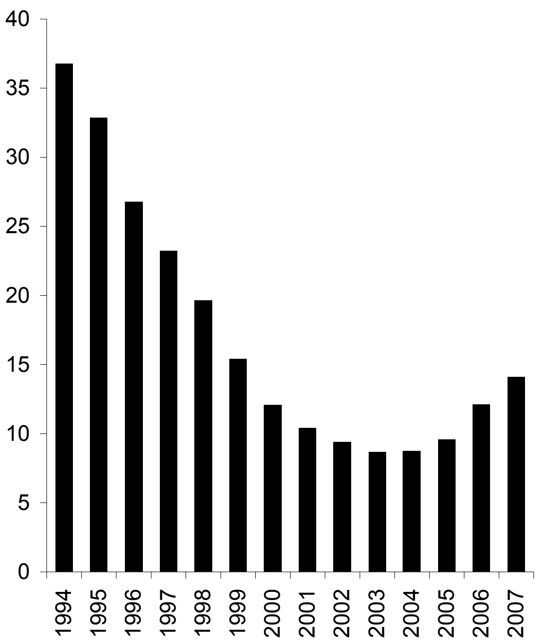
In this context, the private sector credit market started to show a more favorable performance. The supply of financial resources to finance the private sector has been positively affected by a growing availability of domestic savings, a decreasing public sector deficit, and the strengthening of banks' financial indicators. In addition, as individuals and firms restored their financial position and perceived a stable and certain economic environment, they have shown more willingness to demand credit from financial intermediaries. For instance, in 1994 the ratio of total financing to the private sector to GDP was 61.8% and reached its lowest level in 2004, 27.6%. Thereafter, total financing to the private sector followed a positive trend and, in 2007, it represented 32.9% of GDP (Chart 4).

Recently, commercial banks have been recovering their role as primary players in financing private sector activities. From 2004, commercial banks' lending to the private sector rose as a result of both increasing bank deposits and the settlement of an important fraction of credit portfolios related to bank-restructuring programs (Chart 5).[6] Commercial banks' participation in total financing to the private sector expanded. In 2007, it reached 45.8% of total financing, compared to 34.2% in 2004. The surge of commercial banks' credit portfolio to the private sector was not generalized; rather, it has been selective. It is possible to identify three stages in this process: i) in 2002, commercial banks began to increase their consumer credit portfolio, in particular, through credit card lending; ii) in 2005, they started to participate more actively in the mortgage credit market, primarily in the residential mortgage segment; and iii) in 2007, commercial banks began to increase their business credit portfolio (Chart 6).

Chart 5

Commercial banks' lending to the private sector

Percentage of GDP

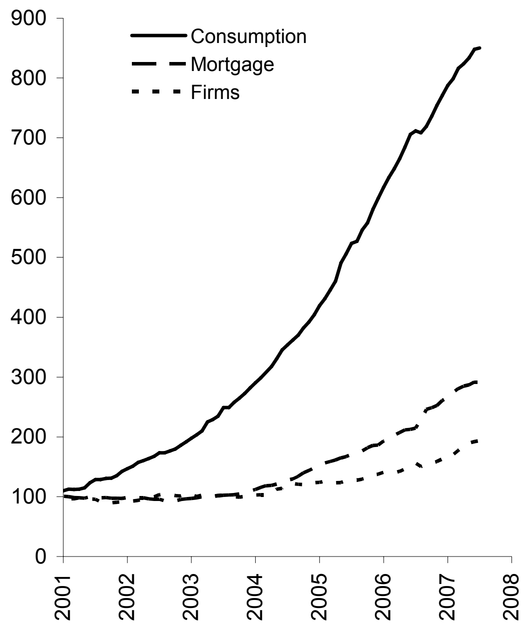


Source: Bank of Mexico.

Chart 6

Commercial banks' lending to the private sector

2001=100 (real terms)



Source: Bank of Mexico.

[6] In 1995, as a result of the financial crisis, the federal government established several banking rescue programs, which included the exchange of commercial banks credit portfolio for bonds backed by the federal government (Fobaproa bonds) with a maturity of 10 years. In 2004 and 2005, commercial banks liquidated a significant amount of these assets, making resources available for other purposes, in particular, to finance the private sector. In contrast, in 2007 bank deposits played a more important role as a source for commercial bank lending to the private sector.

III. The Mexican housing market structure

a. Mexican housing market overview

In order to have a better grasp of the housing credit market structure, the Mexican housing demand, housing stock, and residential real estate sector must be analyzed.

In Mexico, housing demand has been driven, among other factors, by shifts in the demographic profile. In particular, baby-boomers boosted the demand for new housing during the 1980s and 1990s. In recent years, this growth trend has been sustained by the aging population. Even though population growth rates have decreased, household growth rates have increased.[7] Therefore, housing demand is expected to continue growing more rapidly than population during the coming years.

In the last decades, the housing stock in Mexico has changed in both quality and size. For instance, housing conditions such as dimension, regular features and availability of urban services, have improved in general (Table 1).[8] Nevertheless, rural housing conditions are still limited compared to their urban counterparts. The significance of the housing market in the Mexican economy can be measured by several indicators. Mexican housing stock significantly increased in size over the last decades. In 2005, housing stock had more than tripled relative to the 1970s.[9] Preliminary figures indicate that in 2007 the housing stock at replacement cost is estimated to have been 86% of GDP. In that year, the ratio of residential investment to GDP was 5.8% (Chart 7).

Table 1

Mexican housing conditions

% of housing units with

	1970	1980	1990	2000	2005[2]
Tap water	49.4	65.8	76.4	84.3	87.8
Sewerage	41.5	48.0	60.9	75.0	84.8
Electricity	58.9	74.8	87.5	95.0	96.6
One room[1]	40.1	29.9	27.0	23.1	na[2]
Two rooms[1]	28.9	28.7	26.6	24.2	na[2]
More than three rooms[1]	31.0	41.4	46.4	52.7	na[2]

[1] Excludes the kitchen. [2] na: not available.

Source: *Instituto Nacional de Estadística y Geografía,* INEGI.

The Mexican residential real estate sector is composed of two segments. On the one hand, the informal sector is characterized by the lack of well-defined property titles, tax-payments

[7] From 1970 to 1990, population growth was 68.5%, while the number of households increased by 66.1%. Between 1990 and 2005, household growth (53.1%) surpassed population growth (27.1%). Source: *Instituto Nacional de Geografía y Estadística*, INEGI.

[8] Urban services include tap water, electricity, gas for cooking, and sewerage.

[9] In 1970, the total number of housing units was 8.2 million units, compared to 24.7 million units in 2005. Source: INEGI.

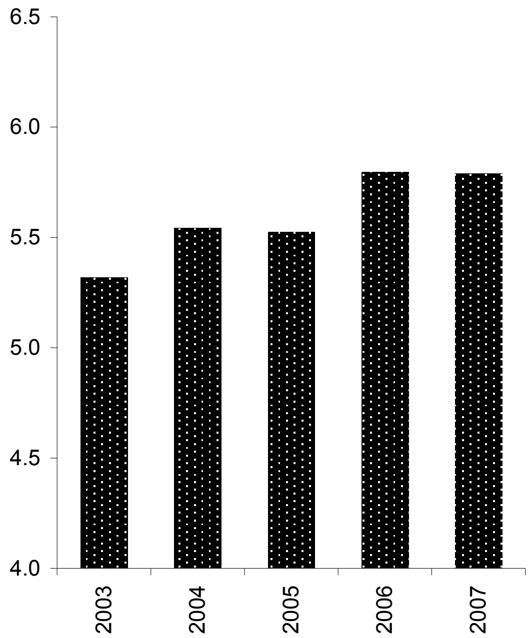
evasion, insufficient access to public services and utilities, and non-eligibility for conventional financing. A large portion of this housing stock was built by its owners (self-construction) with their own resources, since they have limited access to credit. Although informal housing represents a quick solution to fulfilling low-income households' needs, the Mexican government has been encouraging the development of formal construction. For instance, the government has supported self-construction housing programs and promoted the regularization of informal housing. On the other hand, the formal sector mainly includes housing units built and commercialized by real estate developers, as well as self-construction units under the standards established by the authorities. Therefore, these housing units have well-defined properties titles, are registered in the cadastre for tax purposes, and have access to public services and utilities. This segment of the housing market has access to housing finance, and home-owners are usually part of the formal sector of the economy.

Housing finance is highly correlated with developments in the economic activity, specifically in the formal sector of the residential real estate market. Although a large share of construction activity occurs outside formal channels, the formal sector has increased its participation in the total construction market in recent years. Available data on the residential real estate market showed a positive trend in the number of units built by real estate developers of the formal sector. For instance, in 2000 this figure was 282,000 units, compared to 512,000 in 2007; ie it increased by 81.5% in seven years (Chart 8). In the last five years, this market grew at an average annual rate of 8.7%. In 2007, the formal market accounted for around 55% of total housing construction in Mexico.[10]

Chart 7

Real estate residential investment

Percentage of GDP

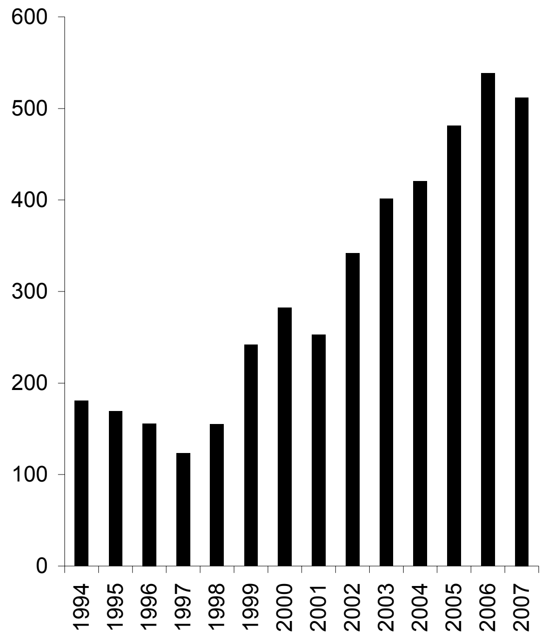


Source: INEGI.

Chart 8

Houses built by real estate developers

Units



Source: Mexican Housing Overview, Softec.

[10] Source*: Mexican Housing Overview, 2008* (Softec).

b. Mexican mortgage market structure

In Mexico, several financial institutions participate in the mortgage credit market. These financial intermediaries can be classified according to different criteria, such as the population segment they serve, the products they offer, the regulation they are subject to, the sources of their funding, their market share, or the economy sector to which they belong. In this paper, intermediaries are classified, for simplicity, into two groups: public and private.

The most important public sector intermediaries (government-sponsored agencies) in the housing credit market are Infonavit and Fovissste.[11] Infonavit provides credit to households who belong to the formal private sector of the economy. Fovissste provides housing finance to employees of the public sector.[12] In general, these institutions are oriented to financing low-income households.[13] However, Infonavit also provides credit to other segments of the market under different programs and initiatives. Fovissste and Infonavit obtain funding through a scheme based on employees' compulsory savings. Therefore, their sources of funding have a long-term profile to finance mortgage credit. Moreover, an important proportion of Infonavit's assets are channeled to finance mortgage loans (93.6% in December 2007).

Infonavit was created in 1972 to develop and build housing projects, and to give long-term mortgage credit to low-income workers. This institution was the primary regulator of low-income housing in Mexico. In 1993, Infonavit gave up its role as a constructor and price regulator in the housing sector. Ever since, it has focused on offering housing finance. The redesign of Infonavit's role changed the mortgage credit market in two ways. First, under the new regime, borrowers can freely choose the house they want to buy; under the former regime, Infonavit assigned the housing units mainly to unionized workers. Second, residential real estate developers take on the risk of funding, building and selling the properties.

Under the Infonavit scheme, employees of the private formal sector of the economy allocate a monthly contribution of 5% of their wage to an individual account.[14] Households have two choices for accessing their resources. First, if they meet the eligibility criteria, they can use their accumulated funds to obtain a direct mortgage loan, or any other loan from other Infonavit-related programs.[15] The resources are used as down payment or credit guarantee to purchase a house.[16] Second, if the worker does not demand a mortgage loan by retirement age (around 65 years), the accumulated resources are added to his or her pension fund.

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[11] *Instituto del Fondo Nacional de la Vivienda para los Trabajadores* (Infonavit), and *Fondo de la Vivienda del Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado* (Fovissste).

[12] Fovissste provides mortgage loans in pesos, with a credit limit of 341 monthly minimum wages (equivalent to US$ 72,247 at purchasing power parity of 2007) and with a maximum term of 30 years.

[13] Other public institutions that participate in the mortgage credit market are Fonhapo (*Fideicomiso Fondo de Habitaciones Populares*), and Orevis (*Organismos Estatales de Vivienda*). Their function is oriented to provide subsidized housing support to low-income households in the informal sector of the economy.

[14] From 1992, as a result of the introduction of a new pension system based on well-defined contributions, workers' housing contributions have been deposited in individual accounts.

[15] The eligibility criteria, based on a parametric model, consider age, salary, amount accumulated in the individual housing account, period of time contributing without interruption to the Infonavit, period of time working for the same employer, and amount of voluntary savings.

[16] Infonavit's mortgage credit is granted at a fixed-interest rate and a monthly payment tied to the behavior of the minimum wage. The interest rate charged is between 4% and 10%.

The segment of private financial intermediaries comprises commercial banks and non-bank institutions specialized in mortgage credit: Sofoles and Sofomes.[17] On the one hand, commercial banks obtain most of their funding through short-term deposits, and most recently through the securitization of their mortgage credit portfolio. Commercial banks usually finance medium to high-income households. On the other hand, non-bank institutions specialized in mortgage credit obtain funding from several sources, such as commercial banks, Sociedad Hipotecaria Federal (SHF) – the Federal Mortgage Company – and the securitization of their mortgage credit portfolio.[18] These institutions are oriented to financing low- to medium-income households, mainly from the formal sector of the economy.

Between 1995 and 2007, the structure of the Mexican mortgage market changed considerably as a result of the financial crisis and reforms to the financial regulatory framework. After the economic crisis of 1995, commercial banks' market share declined significantly. Their position in the mortgage credit market was partially taken over by other financial intermediaries, such as non-bank institutions and public sector institutions, which nowadays play an important role in housing finance. For instance, Infonavit's market share of total housing financing increased considerably from 25.9% to 58.8% during this period.[19] In fact, Mexico has one of the largest market shares of government-sponsored institutions in Latin America.[20] Commercial banks' market share decreased sharply from 72.6% in 1995 to 31.4% in 2007, during the same period (Chart 9). However, in recent years, commercial banks have been more involved in the mortgage credit market and have started to recover their importance. Credit bureaus have supported commercial banks' expansion in this market. They have provided updated credit records that help to assess credit applicants' default and prepayment risks.

Under this market structure, government strategies play an important role in housing credit market developments. Government strategies oversee, among other things, determining mortgage loan products characteristics and mortgage loan origination conditions. However, the behavior of the formal sector of the economy, in particular the labor market, affects public sector institutions' mortgage credit origination through different channels. First, available funding to allocate credit, which depends on workers' contributions, is closely related to employment and payroll levels. Second, applicants' credit score depends, among other things, on the number of consecutive periods contributing to the housing fund. Third, current and expected economic conditions affect households' mortgage credit demand.

The mortgage credit market is clearly segmented into public sector institutions and private financial intermediaries, depending on the population segment they serve. Based on data on the second semester of 2007, Infonavit provides most of its financing, 55% of total mortgage loans, to households with an income level below four times the minimum wage (a monthly income equivalent to US$ 847.50 at purchasing power parity (ppp) of 2007).[21] On the other hand, private commercial banks and other private credit institutions (Sofoles and Sofomes) allocate their total mortgage credit portfolio among households with income levels above four

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[17] Sofoles (*Sociedades Financieras de Objeto Limitado*) are special-purpose non-bank institutions, and Sofomes (*Sociedades Financieras de Objeto Multiple*) are multiple-purpose non-bank institutions. These entities grant consumer credit, mortgage loans, and business credit. However, they are not depositary institutions and are subject to different supervision and regulation than banks. The main difference between Sofoles and Sofomes are that the latter are not specialized in only one credit market as Sofoles.

[18] SHF is a development bank. It provides mortgage credit as a second-floor bank. See Appendix.

[19] Fovissste is not included in the analysis due to the lack of reliable mortgage credit statistics.

[20] Government-sponsored mortgage agencies' market share in other countries of the region: 0% in Argentina and Chile, 6% in Colombia, 27% in Peru, and 56% in Jamaica.

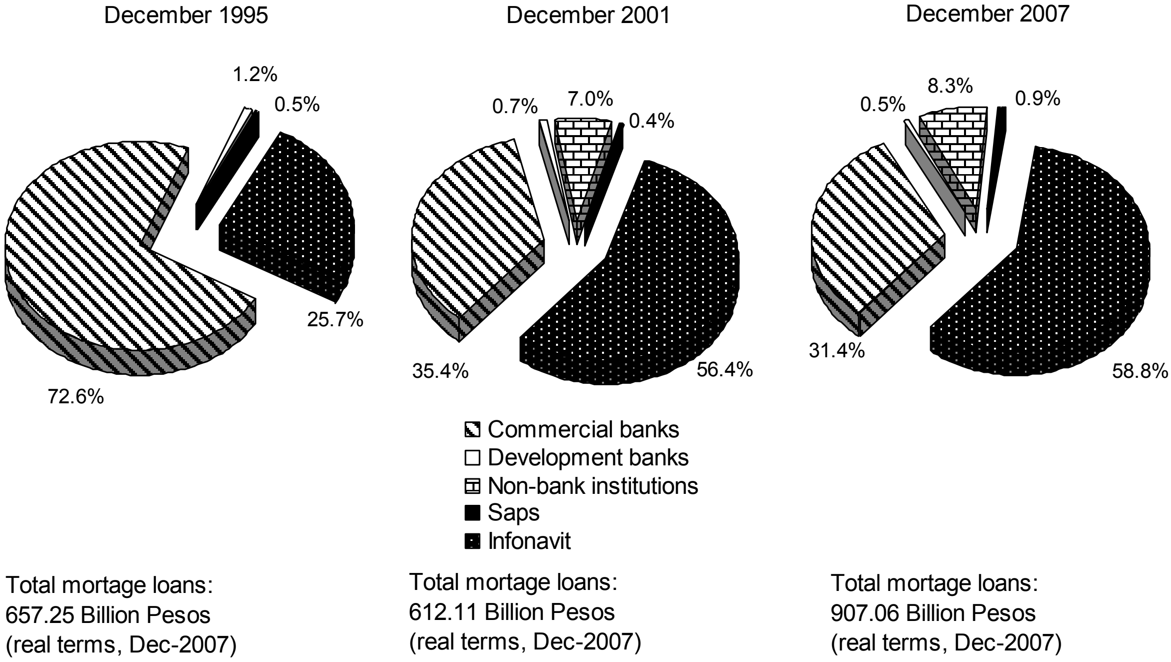
[21] In 2007, the monthly minimum wage was MXN 1,538, equivalent to US$ 211.90 at purchasing power parity of 2007. Source: *Comisión Nacional de Salarios Mínimos* and World Bank.

times the minimum wage (Table 2). Regarding the use of mortgage loans, the mortgage credit market in Mexico is primarily oriented to finance the acquisition of new housing. For example, figures for the first semester of 2007 indicate that 85.7% of total mortgage loans granted by Infonavit were used to purchase brand-new housing units.

Chart 9

Residential real estate lending by financial institution

Percentage structure



Source: Bank of Mexico.

Table 2

Number of mortgage loans by credit institution and income level

Second semester of 2007

Institution	Income level				
	Up to four minimum wages[1]	**Per cent**	**More than four minimum wages**	**Per cent**	**Total**
Infonavit	134,370	55.0%	109,939	45.0%	244,309
SHF (development bank)	1,232	8.0%	14,162	92.0%	15,394
Fovissste	26,332	60.0%	17,554	40.0%	43,886
Financial intermediaries			116,268	100.0%	116,268
Other public institutions[2]	68,932	93.9%	4,451	6.1%	73,383
Total	230,866	46.8%	262,374	53.2%	493,240

[1] In 2007, a monthly income of up to MXN 6,153, equivalent to US$ 847.50 at purchasing power parity of 2007. Source: *Comisión Nacional de Salarios Mínimos* and World Bank. [2] Includes Fonhapo (*Fondo de Habitaciones Populares*), Orevis (*Organismos Estatales de Vivienda*), ISSFAM (*Instituto de Seguridad Social para las Fuerzas Armadas Mexicanas*), Pemex (*Petróleos Mexicanos*), CFE (*Comisión Federal de Electricidad*) and Lyf (*Luz y Fuerza del Centro*).

Source: CONAVI.

IV. Financial innovations in the Mexican mortgage credit market

As mentioned, financial innovations have been implemented in different areas of the housing finance market. First, legal and regulatory frameworks have been modified to increase the mortgage market depth. Second, funding sources of financial intermediaries have been expanded. Third, public and private intermediaries have introduced new mortgage programs and products.

a. Financial system regulation and its institutions

In the last years, several regulation reforms fostered the development of housing finance.[22] First, in 2000, a reform to the foreclosure law (*Ley de Recursos Mercantiles*) improved the conditions and reduced the waiting time for creditors to take over the collateral (real estate) in case of non-payment or bankruptcy. Second, during the same year, the reform to the credit operations law (*Ley General de Títulos y Operaciones de Crédito*) permitted certain financial intermediaries to act as a trustee in asset securitizations. Third, in 2001, modifications to the securities market law (*Ley del Mercado de Valores*) allowed the issuance of stock certificates, known as *certificados bursátiles*, which are the financial instruments used in assets securitization. Fourth, in 2004, the new law to foster transparency and competition in the credit market (*Ley de Transparencia y Fomento a la Competencia del Crédito Garantizado*) was approved. This law promoted the fee-free prepayment of loans and encouraged the standardization of mortgage credit contracts between financial institutions. Recently, in 2007, a reform to this law was passed, empowering the Bank of Mexico to supervise credit commissions and interest rates of financial intermediaries. Moreover, in order to foster both competition and transparency within the financial sector, financial intermediaries have to publish their annual percentage rate of change (*Costo Anual Total, CAT*) for each credit product they offer.[23]

In addition, brand-new financial institutions have emerged in the last years. First, in 1997, the amendment to the law on credit institutions (*Ley de Instituciones de Crédito*) allowed Sofoles to participate in the mortgage credit market.[24] Ever since, Sofoles have played an important role as a mortgage lender. Since 2001, they have acted as the intermediary in charge of allocating the Federal Mortgage Company (SHF) financing resources among households (Chart 10).[25]

Second, in 2001, SHF was created, with the main objective of fostering the primary and secondary mortgage credit market through its role as guarantor and liquidity provider.[26] The main functions of the SHF are to provide long-term financing to Sofoles and Sofomes, to act as collateral in non-bank institutions' issuance of mortgage-backed securities, and to supply mortgage credit insurances and financial guaranties. SHF does not give credit directly to

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[22] *Ley de Concursos Mercantiles* (2000), *Ley general de Títulos y Operaciones de Crédito* (2000), *Ley del Mercado de Valores* (2001), and *Ley de Transparencia y Fomento a la Competencia del Crédito Garantizado* (2004 and 2007).

[23] The term CAT (*Costo Anual Total*) refers to the total costs involved in taking a loan, such as commissions, interest rates, insurances and other fees.

[24] *Ley de Instituciones de Crédito*, 1997. The Sofoles were created in 1993 as a NAFTA (North American Free Trade Agreement) recommendation to create non-bank institutions in Mexico.

[25] Previously, Sofoles allocated FOVI's financial resources.

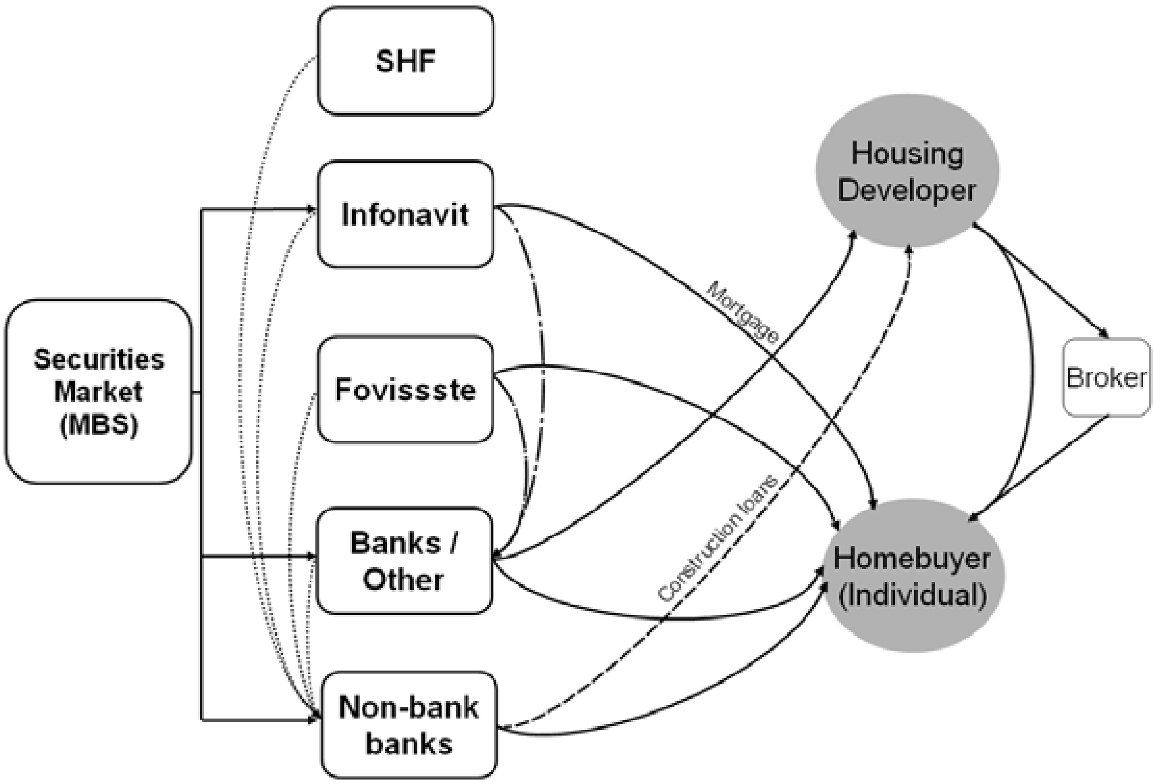
[26] SHF took over Fovi. In 1963, the federal government created Fovi (*Fondo de Operación y Financiamiento Bancario a la Vivienda*) as a Bank of Mexico trust. Its mission was to provide housing finance to low-income households.

households; however, through non-bank institutions, it provides the credit for construction, acquisition and renovation of housing – mainly to the medium- and low-income segment.

Third, in 2006, Sofomes were set up as financial intermediaries that can offer mortgage credit, among other things.

Chart 10

Housing financial intermediaries structure



Source: Bank of Mexico.

b. Funding sources

In the last few years, there have been a number of innovations that have affected the way mortgage loans are financed. For instance, securitization emerged as a convenient funding source, along with financial instruments to cover investors, and technological developments to improve its accessibility.

The development of the domestic bond market has had a positive impact on the expansion of the credit market. Economic stability has extended agents' planning horizon and the bond market has increased significantly in terms of the maturity and the duration of bonds, both public and private, issued in the domestic market. Before 2000, the yield curve considered only instruments with a maturity of up to one year. Now, the yield curve includes fixed-rate government bonds with a maturity of up to 30 years (Table 3). Moreover, these long-term government bonds are now used as a benchmark in the issuance of other long-term liabilities. In addition, the development of the bond market has facilitated the introduction of new instruments, for example asset-backed securities.

As mentioned, changes in the regulatory framework allowed financial institutions to put into practice asset securitization. In particular, securitization of mortgage credit portfolios speeds up financial intermediaries' asset turnover, increases the number of granted mortgage loans, and reduces the interest rates paid by borrowers. In Mexico, Infonavit, Sofoles, Sofomes, commercial banks, and other entities issue mortgage-backed securities (MBS) in pesos and UDIs, through financial trustees.[27,28] Since 2004, Infonavit has issued Cedevis (*Certificados de Vivienda del Infonavit*) to finance a portion of its mortgage loans portfolio.[29] Meanwhile, non-bank institutions and commercial banks have issued Borhis (*Bonos Respaldados por Hipotecas*) to fund part of their portfolio of bridge loans for construction and mortgage loans.[30, 31]

Table 3

Initial public offering of fixed-rate bonds

	3 year	5 years	10 years	20 years	30 years
Date	Jan-00	May-00	Jul-01	Oct-03	Oct-06

Source: Bank of Mexico.

The issuance of mortgage-backed securities has contributed to the development of the private securities market in Mexico. Today, mortgage-backed securities represent 19.2% of this market, compared to 10.1% in 2005. Cedevis have gradually increased their market share; from 2% in December 2005 to 4.1% in December 2007. In 2002, Sofoles securitized Borhis for the very first time. Nowadays, non-bank institutions are still the most active players in MBS issuance (market share of 8.1% in December 2005 and 11.5% in December 2007). Banks started to issue Borhis in 2006, and by December 2007 their market share was 3.6% (Chart 11).

To reduce default risks, Borhis usually come with a cash flow hedging UDIs-minimum-wages swap, which allows debtors to obtain an indexed-to-inflation mortgage loan and pay it back in minimum-wages terms.[32] This financial instrument covers Borhi holders in case of inflation volatility. Besides default risk, Borhi securitization involves other risks, such as prepayment risk, trustee risk, and credit management risk.[33] Consequently, the rating of Borhis (senior and subordinated bonds) depends on both institutions' ratings, the one that acquires the credit portfolio (trustee), and the one in charge of collecting the debtor payments (financial intermediary).

27 Other entities are real estate construction companies. UDIs are Mexican inflation-linked units.

28 In Mexico there is a match between the characteristics of the securitized bonds and the mortgages that back them (balance principle).

29 Cedevis are only backed by Infonavit-originated loans. They do not include other-programs loans like *Apoyo Infonavit* or *Cofinavit*.

30 Bridge loans are short-term loans that are expected to be paid back quickly through subsequent longer-term financing. These loans are provided to housing construction companies. Only Sofoles and Sofomes issue bridge loan Borhis.

31 Credit portfolio with average loan-to-value (LTV) up to 65% for loans in UDIs and 75% for loans in pesos.

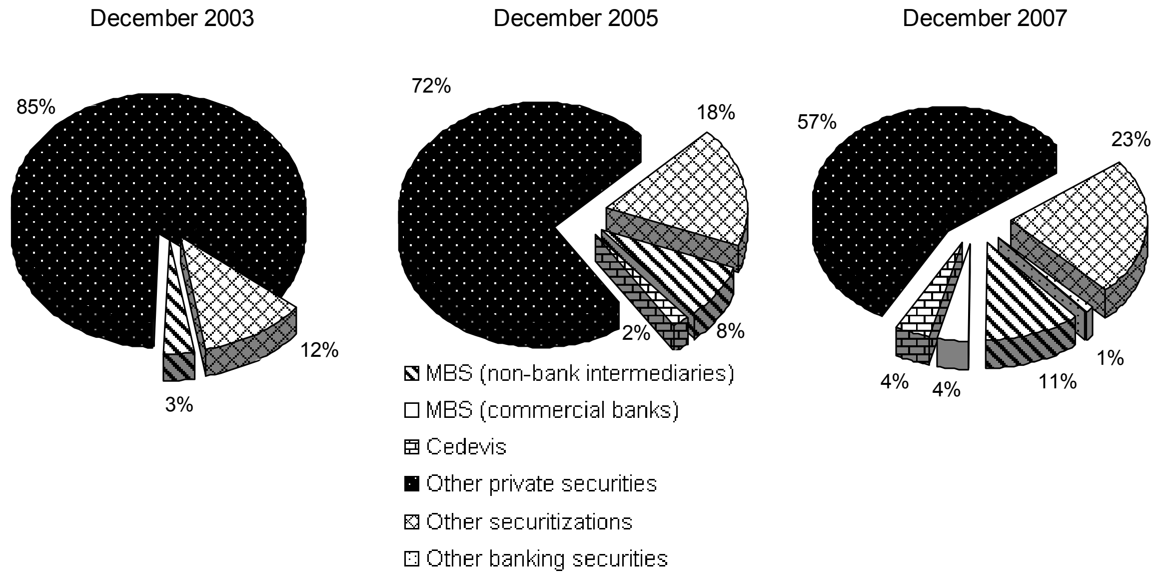
32 The SHF funding to Sofoles and Sofomes will expire in October 2009. However, SHF will keep the role of securitization guarantor and guarantees provider (GPOs).

33 Borhis are "pass-through" securities. That is, the characteristics of the outstanding MBS reflect the terms of the underlying mortgage portfolios (coupon type and term).

Chart 11

Securities market in Mexico

Percentage structure



Private Securities Market: 228.0 Billion Pesos (real terms, Dec-2007).

Private Securities Market: 276.7 Billion Pesos (real terms, Dec-2007).

Private Securities Market: 418.4 Billion Pesos (real terms, Dec-2007).

Source: *Bolsa Mexicana de Valores* (BMV) and *Instituto para el Depósito de Valores* (Indeval).

SHF provides financial guarantees and mortgage credit insurance to promote the secondary market, improve Sofoles ratings, reduce financial costs of mortgage loans, and increase investors' certainty (Chart 12). For instance, on-time payment guarantees (GPOs) cover Borhi holders to up to 85% of the loan offered by commercial banks or non-bank institutions if the debtor does not pay on time. Moreover, SHF provides mortgage loan insurance (GPIs), which cover from the first loss of up to 35% of the unpaid balance due to default of delinquent loans.[34] The benefits of these financial innovations are, among others, market expansion to higher loan-to-value (LTV) segments, discipline in credit originations, credit enhancement for securitization, lower loss provisions, and increased lending opportunities.[35]

In 2006, Hipotecaria Total (HiTo) was established to implement a Danish business model to assist non-bank institutions in the securitization of Borhis. In order to reduce the funding rate and reduce market risk, HiTo promotes the use of a technological framework that allows non-bank institutions to access capital markets continuously to fund their mortgages at any time. The market risk mentioned arises between the origination and securitization of the mortgage portfolio (it takes approximately 28 months on average to take credit portfolios to the securities market).

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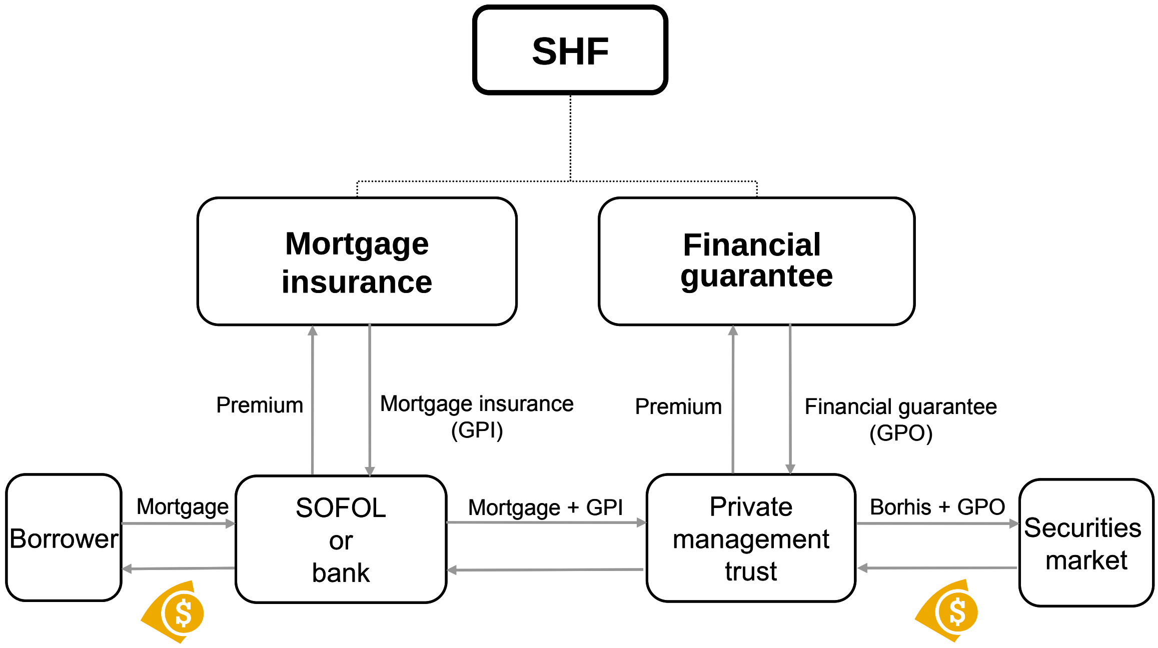
[34] The insurance coverage is allocated to each loan based on the loan-to-value ratio (LTV).

[35] Mortgage loan insurance can be used as part of the down payment to promote loans with higher LTVs without increasing credit risk. In recent years, most down payments have decreased from 35% to 10% of the house value.

Chart 12

Description of the mortgage securitization model of Borhis



Source: SHF.

c. Housing finance products

Infonavit has had an active role in innovating credit products, some of which are now available to households that in the past did not have access to mortgage credit. Infonavit's mortgage credit is granted at fixed-interest rates and a monthly payment tied to the minimum wage behavior. The traditional fixed-rate mortgage credit has a limit of 180 monthly minimum wages (US$ 38,136 at ppp of 2007), and the house value limit of this product is 350 times the monthly minimum wage (US$ 74,154 at ppp of 2007). Additionally to its traditional fixed-rate mortgage credit, Infonavit implemented programs to support low-income workers, and two joint programs with banks and non-bank institutions for workers who earn more than four minimum wages.

First, Infonavit enforced the *Programa de Vivienda Económica* to support workers who earn up to four times the minimum wage. This program promotes the construction of houses with values of up to 118 times the monthly minimum wage (US$ 25,000 at ppp of 2007). Workers are granted a long-term credit with a subsidized interest rate.

Second, in 2001, *Apoyo Infonavit* was launched to support workers whose income is usually more than 10 minimum wages (US$ 2,118.70 at ppp of 2007) and who did not have access to mortgage credit from financial intermediaries (around 2.5 million workers or 15% of total workers). Under this program, a worker can qualify for a financial intermediary mortgage credit using his or her individual account in Infonavit as a non-default guarantee to cover against unemployment, and his/her monthly individual account contributions are taken as mortgage credit payments to reduce the mortgage credit term or monthly payments. There is no ceiling for the house value.

Third, *Cofinavit* is a program that allows workers to obtain a joint credit with Infonavit and a financial intermediary. The advantages include unlimited house value, individual account periodic contributions that reduce credit payments, and the fact that the individual account balance can be used as part of the credit down payment.

Finally, with respect to the eligibility criteria, in 2007 Infonavit introduced a new set of rules to allocate mortgage loans in order to reduce the probability of default should debtors become unemployed.

In recent years, both *Apoyo Infonavit* and *Cofinavit* programs have positively affected the quality of financed housing units. In the past, the majority of households could afford low-income units only through Infonavit traditional housing credit. As a result of implementing the joint-credit programs, credit limits have broadened and some households can now afford medium-income houses.

The stabilization of the inflation rate and well-anchored inflation expectations have influenced the decision of private sector financial intermediaries to offer, in addition to UDI-denominated mortgage loans, peso-denominated mortgage loans at fixed interest rates. Today, financial intermediaries offer a wide variety of mortgage products besides *Apoyo Infonavit* and *Cofinavit*. These products have less stringent credit requirements for applicants – age and monthly income – than the same type of products have had in the past. Commercial banks have implemented mortgage credit products with higher LTVs, longer terms, and fee-free prepayments schemes.[36] In general, their products are in pesos, with fixed-interest-rate schemes. Meanwhile, non-bank institutions provide fixed-interest-rate mortgage loans in pesos and UDIs, with different schemes for payments – fixed or on minimum-wage terms.

Since the late 1990s, the federal government has fostered subsidized housing programs to support the low-income population.[37] For instance, in 1997 a subsidy program – Prosavi (*Programa Especial de Crédito y Subsidios a la Vivienda*) – was implemented to provide mortgage loans to households with income levels of up to five times the minimum wage in both the formal and informal sectors (US$ 1,059.30 at ppp of 2007). Prosavi allocates its resources through SHF and non-bank institutions, offering an upfront subsidy that represents at least 20% of the house's value.[38] By 2001, Prosavi loans represented 35% of Sofoles' portfolio. However, in 2006, the number of loans decreased by 93% because of higher delinquency rates and increasing costs.[39]

In addition, there are programs to support self-construction projects of lower-income households. Moreover, SHF has enforced programs to foster housing credit accessibility for specific population segments. For instance, SHF has implemented a leasing program for immigrants, with the option of buying through a housing credit. Also, remittance-backed mortgages were created to allow resident families of Mexican expatriates to obtain a mortgage credit from commercial banking or non-bank institutions. These mortgages are backed by savings accounts that are funded by remittances from relatives living abroad. SHF and Fonhapo launched a credit product to renovate or enlarge housing of low-income households of the informal sector of the economy – mainly in rural areas.

In 2007, a program to regulate mortgage-credit subsidies granted by the federal government through public and private intermediaries was implemented (*Programa de Esquemas de Financiamiento y Subsidio Federal a la Vivienda*), in order to promote house purchase among low-income households. Under this program, individuals with an income level of up to

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[36] LTV of up to 95%, and credit term no longer than 30 years.

[37] Between 2001 and 2006, the federal government devoted around US$ 1,800 million to place 243,000 subsidies (Source: CONAVI).

[38] The maximum subsidy is 8,000 UDIs (US$ 4,240 at ppp of 2007) and the maximum house value is 40,000 UDIs (US$ 21,202 at ppp of 2007).

[39] From 20,000 loans in 2001 to 1,400 in 2006.

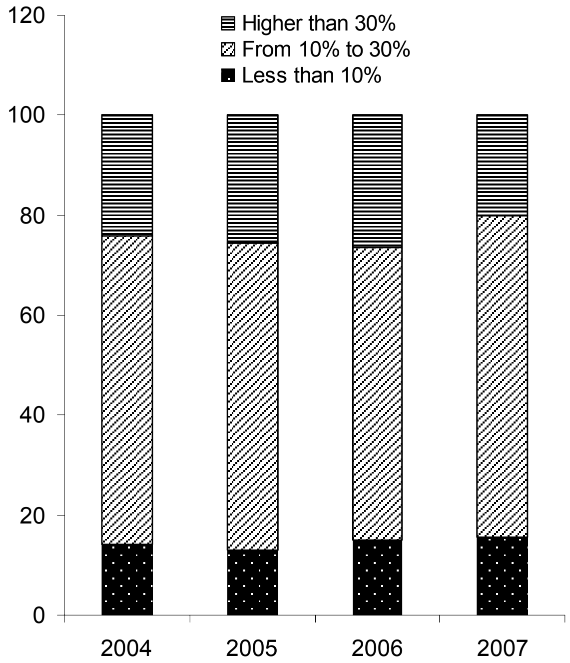
2.6 minimum wages (US$ 511 at ppp of 2007), or married couples with a joint income of up to four minimum wages (US$ 847.50 at ppp of 2007) can access a credit to buy or renovate a house with an upfront subsidy to complement the down payment; thus, this scheme basically reduces the LTV of the property. To qualify for this program, the worker needs to have savings equivalent to at least 4–5% of the house value. In addition, there is a house price limit of 148 monthly minimum wages (US$ 31,144 at ppp of 2007) and the upfront subsidy limit is 33 monthly minimum wages (US$ 6,992 at ppp of 2007); the subsidy decreases as the price of the house increases.

In 2007, Infonavit introduced the program *Esta es tu Casa*, designed to support households with an income level between one and 2.6 minimum wages (equivalent to a monthly wage of between US$ 211.90 and US$ 511 at ppp of 2007). The mortgage loans granted under this program include a governmental upfront subsidy to complement the down payment. This subsidy is awarded when the worker contributes a certain amount of savings.[40]

Chart 13

Monthly payment to household income ratio

Per cent

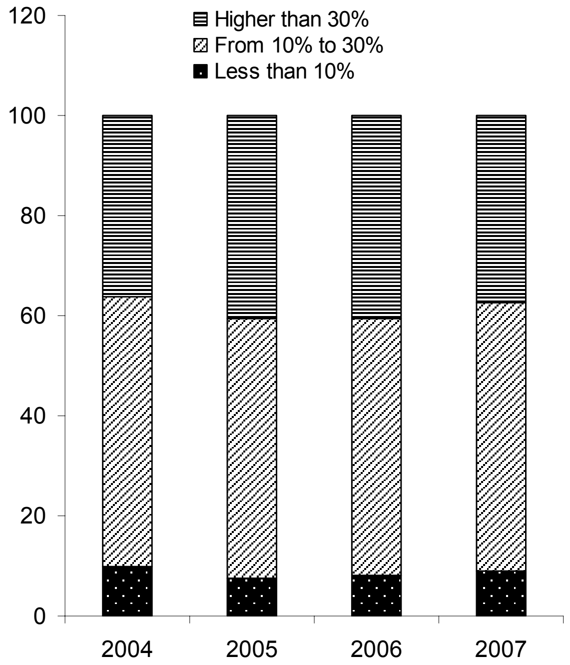


Source: Bank of Mexico. Financial System Report, 2007.

Chart 14

Down payment to house value ratio

Per cent



Source: Bank of Mexico. Financial System Report, 2007.

Despite the number of financial innovations introduced in recent years, mortgage credit products in Mexico are still conservative. In particular, the possibilities of equity withdrawal are very limited. A regular mortgage loan has the following characteristics: i) a fixed nominal interest rate; ii) a 15- to 20-year term; iii) a monthly payment that represents no more than 30% of the borrower income (Chart 13); iv) positive amortization; and v) fee-free prepayment.

[40] The maximum subsidy is MXN 37,000 (US$ 5,096 at ppp of 2007), and to qualify for it the worker needs existing minimum savings of MXN 7,900 (US$ 1,101 at ppp of 2007). This scheme is part of the Programa de Esquemas de Financiamiento y Subsidio Federal a la Vivienda.

In Mexico, households face several constraints and transaction costs in asset management, specifically equity withdrawal from housing wealth. The down payment to house-value ratio (one minus loan-to-value ratio) of mortgage finance by commercial banks represents around 30% (a loan-to-value ratio of 70%), and has remained stable in recent years (Chart 14).[41] In general, mortgage loans from non-bank institutions show higher LTV ratios than commercial banks' loans. Moreover, the higher the house value, the lower the LTV is. In addition, mortgage credit refinancing is very costly. House purchase requires the payment of high legal fees and taxes, which represent 6–8% of the value of the property.[42]

V. Recent developments in housing finance

From a macroeconomic perspective, lower inflation and interest rates, increased credibility in monetary policy conduct, financial market deepening, and decreasing public sector demand for financial resources have been the main reasons for the recent expansion of mortgage credit. In addition, there are other factors related to structural and regulatory issues that explain the recent developments in housing finance.

Innovations in housing finance have had an impact on the recent behavior of the residential real estate credit market in Mexico. In particular, innovations in the regulatory framework, funding sources and financial products have positively affected housing finance accessibility, origination, financial instruments, costs, products, and availability. This section describes the developments on mortgage credit market and mortgage-backed securities market in order to show the impact of financial innovations on these areas. The analysis focuses on the recent mortgage credit expansion, the behavior of mortgage credit delinquency rates, and the situation of the mortgage-backed securities market.

a. Mortgage credit expansion

Between 2001 and 2005, total mortgage credit remained relatively stable, and represented on average 8.1% of GDP. Afterwards, this indicator adjusted significantly upwards, and in 2007 the ratio of total mortgage credit to GDP was 9.2%, 1.1% points more than in 2005 (Chart 15). Still, this ratio is lower than those registered in other emergent market economies.[43] Between 2005 and 2007, the average annual growth rate of total mortgage lending was 7.2% in real terms (Chart 16).

The introduction of financial innovations, in terms of both products and sources of financing, might generate a sharp increase in housing finance and in some cases the presence of a credit boom in mortgage loan markets. Therefore, the analysis of the mortgage credit recent behavior is relevant in determining a credit boom in Mexico.

The standard Hodrick-Prescott methodology was applied to assess the existence of a credit boom in the mortgage market. This methodology decomposes series into trend and cyclical components. They help to identify abrupt changes in a given variable. The variable to test is the seasonal-adjusted portfolio of mortgage credit in real terms. Abnormal growth is defined,

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[41] The typical loan-to-value ratio in the United States and Japan is 80%; in the United Kingdom, Canada and France it is 75%; and, in Spain, Ireland and Germany it is 70%. Source: IMF, *The changing housing cycle and the implications for monetary policy*, 2008.

[42] Source: Asociación de Banqueros de México (ABM).

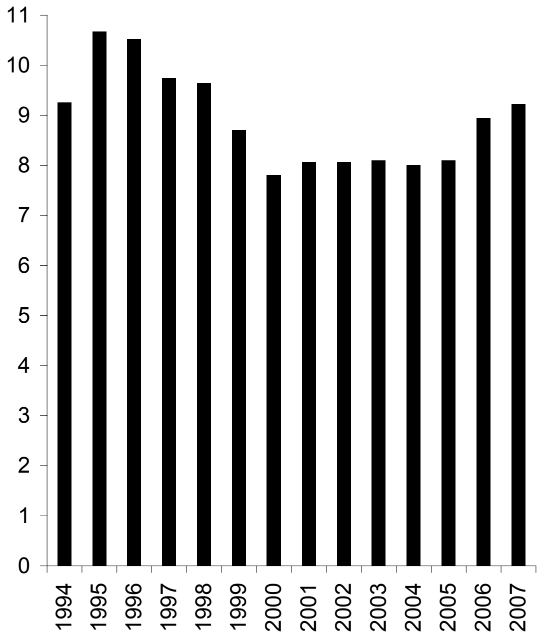
[43] In 2006, housing finance in Chile represented 14% of GDP; in Canada 48.1%; in the United States, 73.3%; in Australia, 81.8%, and in New Zealand, 85.1%. Source: central banks' websites.

in general, as an episode in which credit expansion deviates more than the typical business cycle expansion. To detect an episode of abnormal credit growth, the deviation of the cyclical component from the long-term trend should be higher than a specific threshold.[44] The assumptions in the model are that the outstanding mortgage credit Y_t is integrated by a trend component T_t, related to the long-term behavior, and a cyclical C_t component as a result of business cycle shifts, plus a pure random component ε_t. That is: $Y_t = T_t + C_t + \varepsilon_t$. Therefore, an observation is considered as irregularly high when its cyclical component is above the established threshold; ie $\frac{C_t}{T_t} > \alpha$, where $\alpha = 2.5\%$. In addition, a period is regarded as a credit boom period in the market when its observations deviate constantly and significantly from the long-term trend.

Chart 15

Mortgage credit

Percentage of GDP

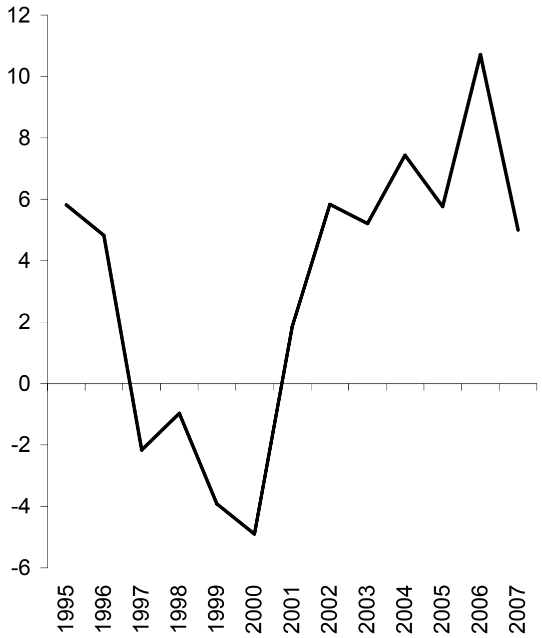


Source: Bank of Mexico.

Chart 16

Mortgage credit

Real growth rate



Source: Bank of Mexico.

The analysis was performed on monthly seasonally adjusted data of real total mortgage credit from December 1994 to June 2008. Infonavit and private sector financial intermediaries' portfolios were included. The results of this test indicate no abnormal growth for total mortgage portfolio, as well as the Infonavit mortgage portfolio (Charts 17 and 19). Meanwhile, in the case of private credit institutions' mortgage portfolio, a sharp expansion of credit is evident during 2006. However, there is no evidence to support the existence of a mortgage credit boom (Chart 18).[45]

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[44] In this analysis, the threshold factor was set at 2.5%.

[45] As the Hodrick Prescott model suggests when analyzing monthly data, the test was performed with a "smoothing" parameter (λ lambda) of 14,400.

Chart 17

Total mortgage portfolio[1]

MXN billion, June 2002

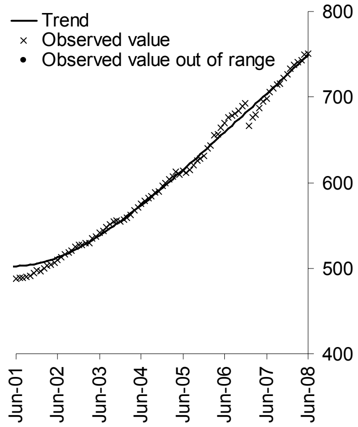


Chart 18

Private credit institutions' mortgage portfolio[1, 2]

MXN billion, June 2002

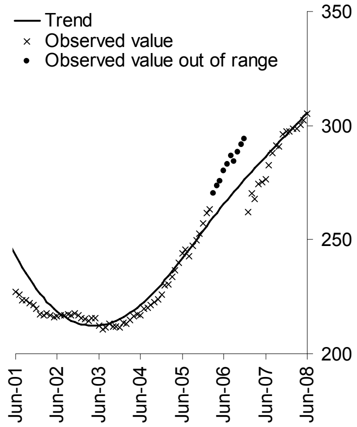
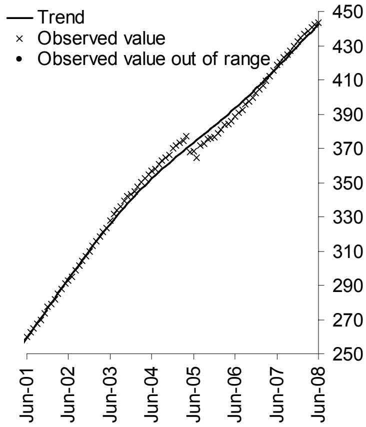


Chart 19

Infonavit mortgage portfolio[1]

MXN billion, June 2002



[1] In the model, the threshold factor was set at 2.5 percent. [2] Commercial banks and non-bank institutions.

Source: Bank of Mexico and Infonavit.

The recent mortgage credit expansion has been the result of several factors, such as:

i. A sustained, but still moderate, growth of the Mexican economy in recent years (Chart 20).

ii. The expansion took place after a long period of mortgage credit portfolio contraction. The ratio of total mortgage credit by private credit institutions to GDP reached its lowest level in 2003 (3.3%) compared to 6.6% in 1994.

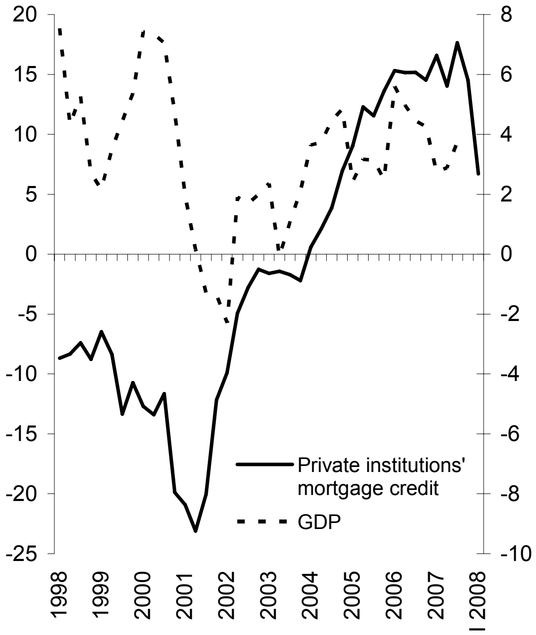
iii. The growing availability of resources in the private financial institutions, in particular commercial banks, and the decision to allocate more resources to the mortgage credit market. Basically, commercial banks decided to return to the mortgage credit market after years of poor participation. In addition, other private credit institutions (Sofoles and Sofomes) introduced more aggressive strategies to grant mortgage loans. In 2007, the number of mortgage loans awarded by private credit institutions was 223,800, compared to 71,900 in 2003 (Chart 21).

iv. Innovations in the mortgage credit market have positively affected the behavior of housing finance. In particular, the relaxed credit conditions for households as a result of: a) accessibility to accumulated resources from the housing fund individual account to enhance a private credit institution mortgage credit, mainly to reduce down payments; b) the elimination of house-value ceilings in the co-financing schemes of Infonavit; and c) the use of Infonavit contributions to complement the monthly credit payment. Nowadays, most products offered by private credit institutions can be complemented with resources coming from housing-fund individual accounts. In 2003, the number of mortgage loans placed under the schemes *Cofinavit and Apoyo Infonavit* was 2,300. In 2007, this figure was 78,200 (Chart 22). The percentage of private financial institutions' mortgage loans awarded with Infonavit credit programs thus increased from 3% in 2003 to an average of 35% during the 2005–07 period.

Chart 20

GDP and private institutions' mortgage credit

Annual real growth rate (%)

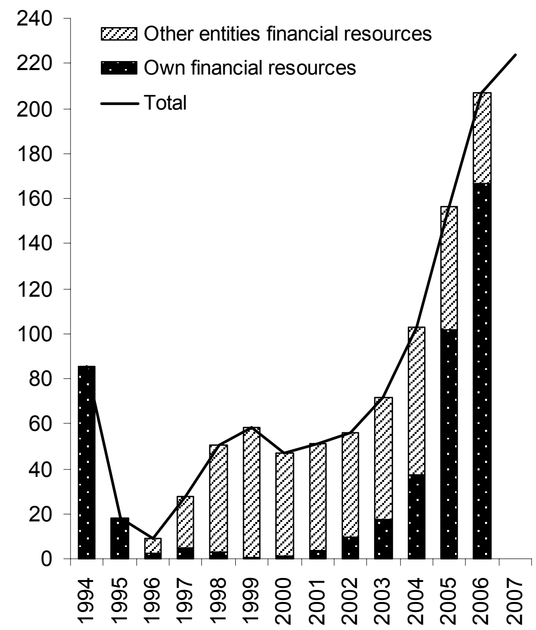


Source: INEG and Bank of Mexico.

Chart 21

Private credit institutions' mortgage loans by funding source

Thousands



Source: CONAVI.

v. Subsidy schemes have increased the access of low-income households to mortgage credit. For example, during 2007, 76,300 credits with an upfront subsidy were granted to purchase houses, compared to 71,200 during the first half of 2008.

vi. Since 2003, households can deduct from their taxes the real component of paid interests on mortgage loans to finance their housing acquisition, construction, or remodeling. This deduction does not apply when households borrow money against the value of their house (mortgage equity withdrawal).

vii. Subsidized interest rates on loans granted by public institutions. The interest rate charged on a standard loan ranges between 4% and 10% (according to household income level), below the average interest rate on a commercial bank loan (12–14%).[46]

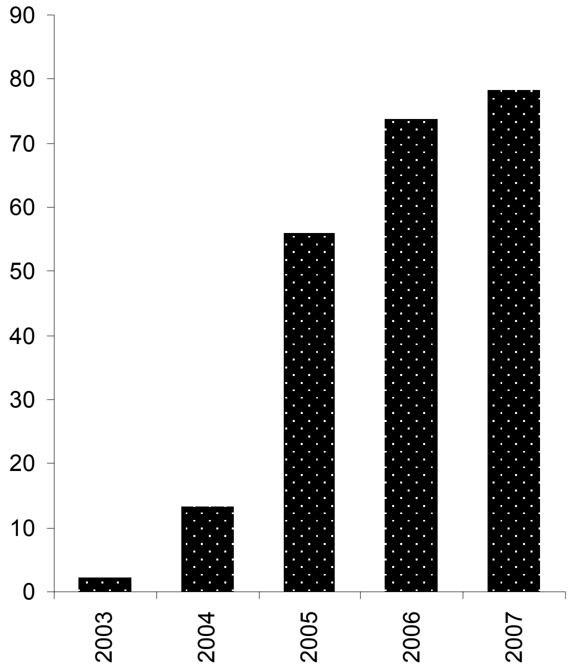
viii. Finally, the mortgage credit expansion was not driven by a significant downward adjustment in its related costs. In 2006 and 2007, both mortgage interest rates and the CAT of commercial banks and Sofoles have remained relatively stable (Chart 23).

[46] The interest rate charged to an Infonavit credit ranges between 4% and 10%. Mortgage credits by Fovissste charge an interest rate of 4–6%.

Chart 22

Cofinavit and Apoyo Infonavit credit

Thousands

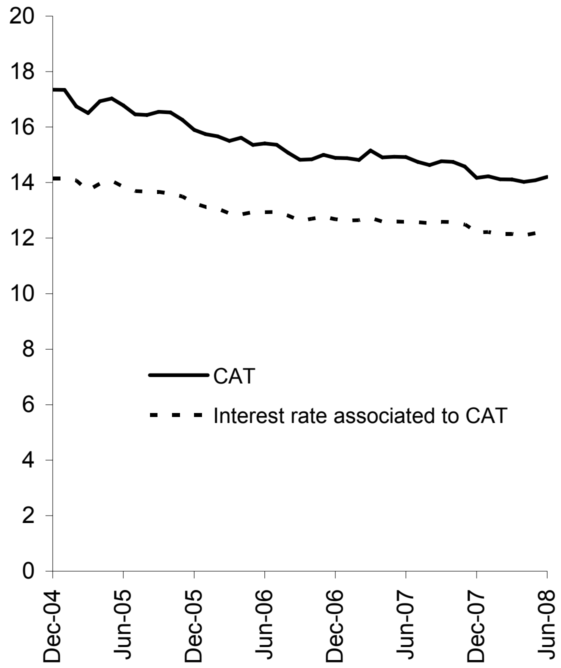


Source: Infonavit.

Chart 23

Mortgage loans' interest rates

Per cent



Source: Bank of Mexico.

b. Non-performing loans and solvency indicators

Delinquency rates and default rates of mortgage loans offer a picture of the non-performing loans behavior. In particular, Mexican mortgage credit market delinquency rates figures are closely related to the market segment served by different financial institutions. Also, some solvency indicators can be used to evaluate financial intermediaries' strength against credit risk.

Commercial banks offer mortgage loans mainly to households of middle and high-income segments with a well-established credit record. Since 2004, average delinquency rates of commercial banks mortgage credit have remained stable at around 2.6%, which represents a significant decline from high figures observed in past years (in 2004 it was 4.3%). In June 2008, commercial banks' delinquency rate of mortgage credit was 2.9% (Chart 24).[47] The default rate of mortgage loans by vintage – based on the year of loan origination – has remained relatively stable since 2002 (Chart 25). This behavior suggests that the mortgage credit origination criteria of commercial banks have been consistent over the years.

Sofoles primarily finance the house purchase of low- and medium-income segments of the population. Delinquency rates of the credit portfolio of these intermediaries are higher than commercial banks' rates because their market segment has higher default indices and the maturity of their portfolios is lower – around ten years. In addition, non-bank institutions apply the originate-to-distribute model, in which a real estate developer is responsible for

[47] The delinquency rate is defined as the ratio of non-performing credit portfolio to total credit portfolio. This is a measure of the risk level of a credit portfolio. This indicator depends on both borrowers' payment habits, and loan-loss reserves management.

originating mortgage loans. This model may promote a loosening of underwriting standards, because originators do not keep the loans, and they have strong incentives to sell as many units as possible. Recently, mortgage credit delinquency rates of Sofoles have increased considerably (Chart 24).

Chart 24

Delinquency rates[1]

Per cent

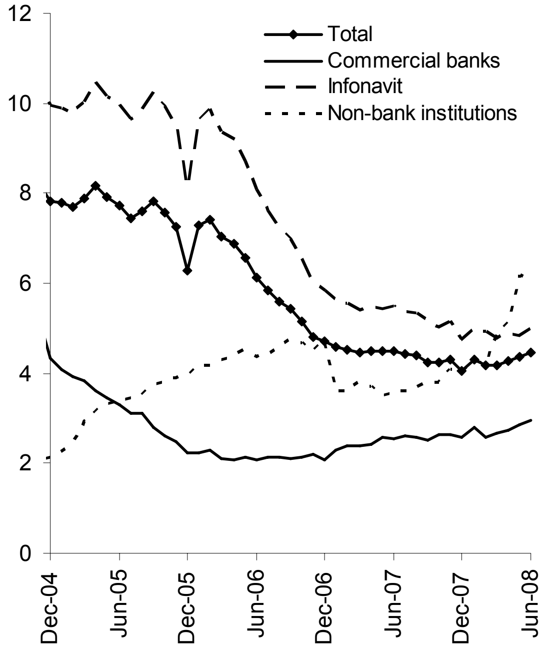
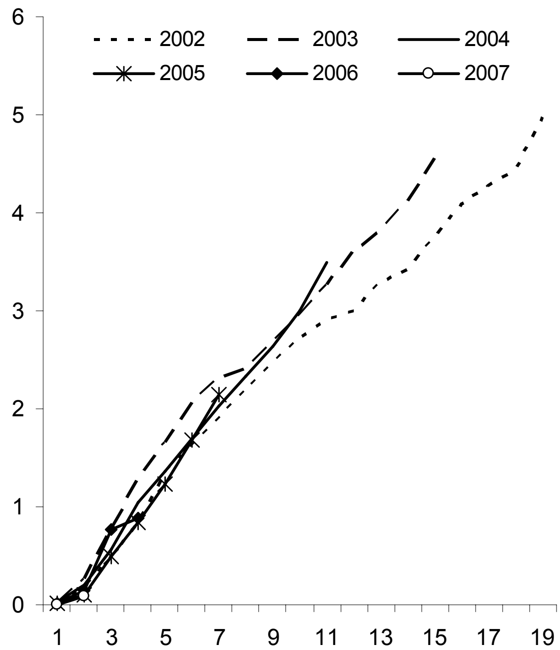


Chart 25

Default rate of commercial banking mortgage loans portfolio by vintage[2]

Per cent (Y) and passed quarters (X)



[1] Ratio of the amount of outstanding loans in pesos that are delinquent to the amount of total loans outstanding in pesos. [2] Default rate is the ratio of the number of loans that cease payment for a given quarter to those who were up to date with payments during the same period.

Source: Bank of Mexico and Infonavit.

Public sector institutions' mortgage credit is mainly allocated within low-income segments. Despite the use of credit scoring models to obtain a better assessment of borrowers' credit risk, the average delinquency rate of Infonavit has remained high. For instance, it remained around 5.2% between 2006 and 2008 (Chart 24). As previously mentioned, Infonavit basically provides credit to low-income households. In particular, between 2005 and 2007, 25.7% of total mortgage loans were granted to households with an income level of up to 1.5 minimum wages, a segment that represents a higher credit risk.

In order to evaluate commercial banks' strength against credit risk, two solvency indicators are shown. First, regulators measure a bank's solvency with the capital adequacy index (*Índice de Capitalización*, ICAP). This indicator can be used to evaluate banks' resilience to the risk exposure.[48] ICAP is the ratio of regulatory capital to market and credit risk weighted assets.[49] In particular, commercial banks' ICAP showed a slight improvement between

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[48] Source: Bank of Mexico, *Financial System Report 2006*, May 2007, pp 60–63.

[49] Regulatory capital is composed of Tier 1 and Tier 2 capital.

June 2006 and June 2008, from 14.6 to 16%, respectively (Chart 26). Second, credit coverage ratio provides information about commercial banks' coverage against credit risk.[50] The banking accounting standards stipulate the minimum amount of loan-loss reserves commercial banks have to hold based on the scoring of their credit portfolio. Although banks' credit coverage ratio has decreased from June 2006 to June 2008, commercial banks' loan loss reserves cover by 1.5 times the non-performing loans on average (Chart 27). Consequently, commercial banks' solvency and resilience to credit risk have not been disturbed by the recent mortgage credit expansion.

Chart 26

Commercial banking capital adequacy index[1]

MXN billion

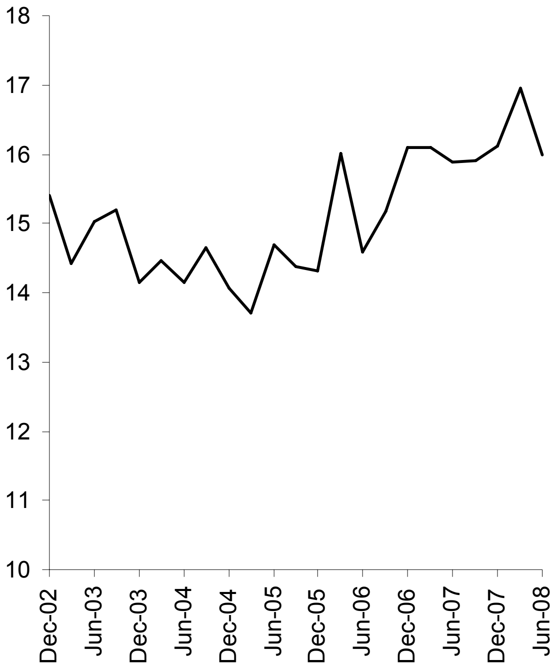
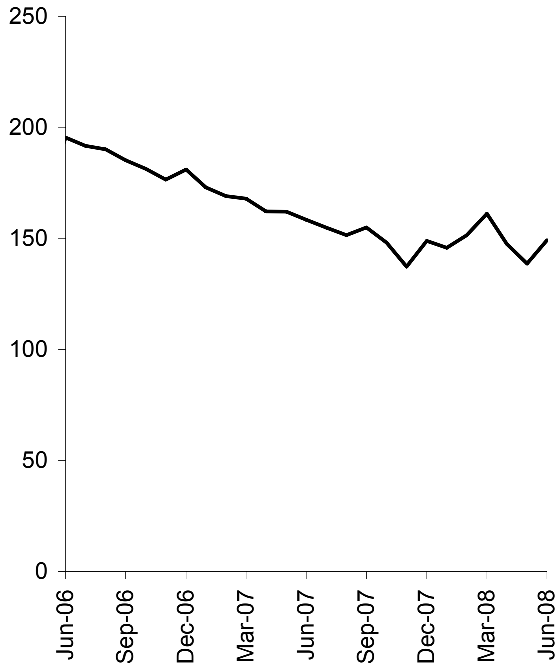


Chart 27

Commercial banks' credit coverage ratio[2]

Per cent



[1] Weighted average value of each bank's assets. [2] Ratio of loan loss reserves to non-performing loans.

Source: Bank of Mexico.

c. Mortgage-backed securities (MBS) market

Initially, securitization of mortgage loans was an important funding source for non-bank institutions, and to a lesser extent for Infonavit and commercial banks (Chart 28). However, in December 2007, one of the most important commercial banks in Mexico started to issue MBS as part of a 5-year program. Therefore, commercial banks' participation in the MBS market is expected to increase over the next years. As of June 2008, most issuances were in UDIs (69 out of 87 total issuances). In June 2008, the total MBS securitization accrued amount was MXN 89,500 million pesos – 54% of non-bank institutions, 26% of Infonavit, and 19% of banks – (Chart 29). During the same period, the distribution of the total MBS securitization accrued amount was 46% in pesos and 54% in UDIs (Chart 30).

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[50] Credit coverage ratio is defined as the ratio of loan loss reserves to non-performing loans.

Chart 28

Total MBS securitization by June 2008

Number of issuances

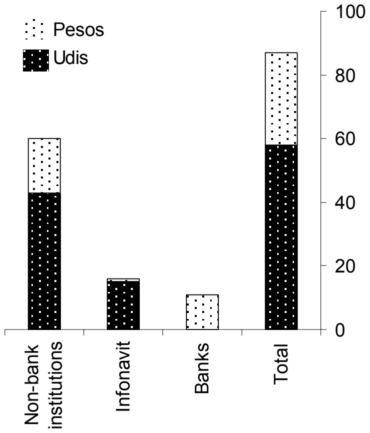


Chart 29

Total MBS accrued securitized sum by intermediary

MXN billion

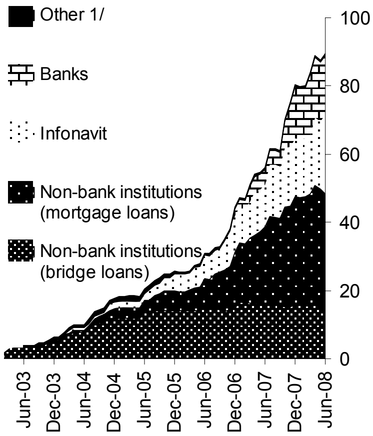
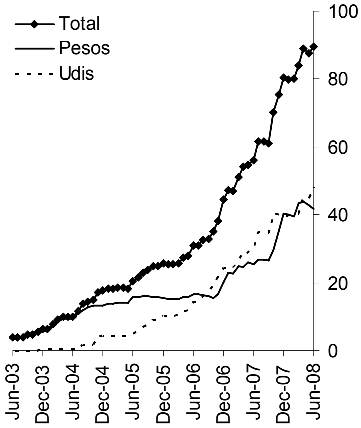


Chart 30

Total MBS accrued securitized sum by units

MXN billion



[1] Includes real estate construction companies.

Source*: Bolsa Mexicana de Valores* (BMV) and *Instituto para el Depósito de Valores* (Indeval).

Although securitization is regarded as a convenient funding source for non-bank institutions, its incidence is still low. In 2007, the highest number of MBS issuances was registered: 33 out of 87 total issues outstanding. However, securitization of mortgage loans does not represent an important share of the private securities market (18.6% in June 2008) (Chart 31).[51] It also represents a small portion of the outstanding mortgage credit portfolio (7.4% in June 2008) (Chart 32). Therefore, the Mexican MBS market remains small-scale.

Regarding MBS credit ratings, all Cedevis issuances up to June 2008 have the same rating as government bonds (AAA on a local scale).[52] High credit ratings respond to the Infonavit loans origination characteristics, such as direct payment through payroll deduction, and debtors insured against accidental death and serious injuries. Meanwhile, Borhis rating range is between A and AAA depending on the issue "tranche" structure (senior or subordinated). In general, MBS are attractive to pension funds' and insurance companies' managers because of their high credit rating, long-term (10–30 years) issue, real returns (UDIs denominated bonds), and slightly higher yields than government bonds.

[51] The private securities market includes total securitization and private debt securities (financial and non-financial companies). Public sector securities were excluded from this calculation.

[52] Cedevis have the highest S&P, Moody's and Fitch ratings for debt securities in Mexico.

Chart 31

Total MBS securitized vs total debt securities[1]

Per cent

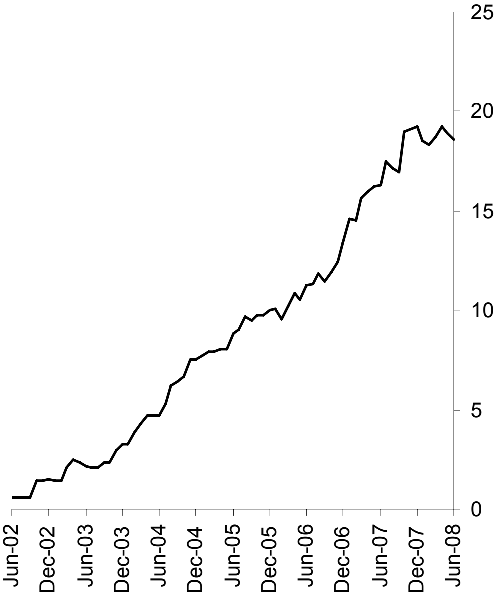
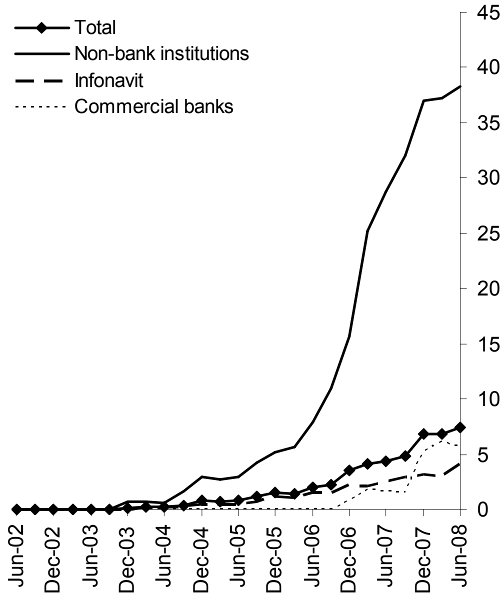


Chart 32

Total MBS securitized vs in-balance mortgage loans[2]

Per cent



[1] Includes private debt securities, MBS and other asset securitizations. [2] Includes outstanding mortgage loans portfolio of commercial banks, non-bank institutions and Infonavit.

Source: Bank of Mexico, *Bolsa Mexicana de Valores* (BMV), and *Instituto para el Depósito de Valores* (Indeval).

VI. Final remarks

In Mexico, housing demand is expected to continue to rise in the coming years, as a result of increasing household growth rates. In particular, housing finance expansion will continue to play a key role in an effort to meet housing demand.

The recent macroeconomic stability and fiscal policies have supported higher financial resources availability for the private sector. Furthermore, public and private financial intermediaries have increased their supply of housing finance through innovations in their funding sources, and credit mortgage products. These innovations have been an important factor in recent housing finance expansion and commercial banking market penetration. However, the Mexican mortgage market is still conservative and small compared to other emergent market economies. In addition, given the size of the existing housing gap for the low-income end of the Mexican population, the government has to continue playing an important role in promoting the development of housing finance.

Although new funding techniques have emerged to enhance the traditional deposit-taking funding sources, they still remain small-scale. In particular, securitization of mortgage-backed assets is not a common practice in Mexico. In fact, it does not represent a significant portion of the total private issuance of securities. Moreover, only a small proportion of the total mortgage credit portfolio is put through securitization.

Developments in financial system regulation, along with mergers and acquisitions of Mexican banks, with foreign banks have encouraged better banking practices, higher competition, and a more transparent financial environment. Furthermore, the recent mortgage credit expansion in Mexico has not deteriorated commercial banks' solvency and credit coverage.

Appendix:
The Federal Mortgage Company (SHF) and mortgage securitization[53]

The Federal Mortgage Company (*Sociedad Hipotecaria Federal*) was founded in 2001 with the aim of developing the primary and secondary mortgage markets. Since then, the SHF has worked to create an alternative financing mechanism for financial institutions that grant mortgage loans, in particular for non-bank institutions. Portfolio securitization is one of the most efficient mechanisms that allow creditors to obtain funding to grant loans. The development of an active mortgage securitization market requires:

- A pool of mortgage loans originated and administered according to international best practices. The SHF has established minimum origination and administration guidelines that institutions receiving financing from the SHF must fulfill.
- Securitization structures with mechanisms to offset risk. SHF has granted two types of guaranties: 1) Mortgage credit insurance (GPI), which covers up to 35% of the initial loss of each mortgage; and 2) Partial financial or timely payment guaranties (GPO) to issuers of securities who fulfill certain criteria.
- Investors with long-term horizons. The SHF has increased the liquidity of Borhis by participating directly in the secondary market as market makers.
- Efficient mechanisms to allow continuous portfolio origination in order to reduce risk for those granting and administering loans.

The development of mortgage-backed securities (MBS) has enabled non-bank institutions to securitize their portfolio directly and allowed others to act as securitization pools, purchasing mortgages from smaller non-bank institutions to further securitize them.

To support the development of efficient portfolio origination mechanisms and make securitization easier for small and medium-size lenders, a company called *Hipotecaria Total* (HiTo) was set up, with the participation of the SHF. Its purpose is to create a platform that enables an integrated link between the creation of mortgage loans and capital markets. The HiTo model is based on the experience of Denmark. The development and technological aspects of the HiTo are carried out by the Danish Central Securities Depository. Some benefits expected from the HiTo are: i) a reduction in the time between loan placement and securitization; ii) direct and continuous access to capital markets for lenders; iii) more active participation of small and medium sized financial intermediaries; and iv) an interest rate stated at the moment of credit portfolio securitization, which will eliminate the market risk due to the time between the placement of a credit and its securitization.

[53] Source: Bank of Mexico, *Financial System Report 2006*, May 2007, p 107.

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Ministry of Finance (*Secretaría de Hacienda y Crédito Público,* SHCP):
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National Banking and Securities Commission (*Comisión Nacional Bancaria y de Valores,* CNBV*):* http://www.cnbv.gob.mx/.