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Housing Finance in Brazil:

Institutional Improvements and Recent Developments

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Abstract[*]

Despite a recent expansion in housing finance, Brazil still faces a severe housing shortage, especially among lower-income people, and it is important to examine the development, limitations and prospects of the country's housing finance market. This paper investigates the recent evolution of that market in Brazil, focusing on whether the current expansion in mortgage lending is the result of institutional and economic improvements favoring economic stability and compliance with contractual obligations or is merely an effect of the higher level of housing loans imposed by the government on financial institutions. Different explanations are found for private and public institutions.

JEL Classifications: D23, N97, R21, R31, R38
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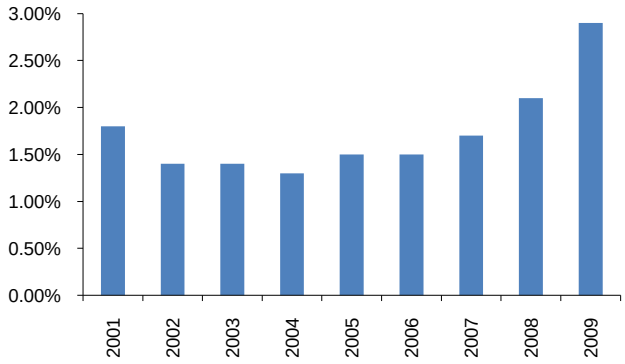
1. Introduction

The recent expansion in the Brazilian real estate market can be understood as a natural consequence of the economic stabilization achieved in recent years and institutional improvements that enhanced guarantees to lenders, leading to the strengthening of the housing finance market.

To achieve sustained growth of mortgage lending, in which loan maturity is usually longer than 15 years, it is important to have economic stability and an institutional framework that guarantees creditors' property rights[1] in case of default. However, despite the consolidation of macroeconomic stability—achieved with the adoption of the Real Plan in 1994[2] and the implementation of inflation targeting in 1999—the mortgage market is still relatively weak due to high interest rates. Since housing loans have long terms, any marginal change in the lending price substantially alters the effective price of the property to the borrower. Hence, a necessary condition for the development of this market is a fairly low interest.

Even with the recent expansion of the volume of housing loans, the share of this type of lending is still low in the Brazilian economy compared with similar countries, reaching 6.2 percent of total loans in December 2009 and 2.9 percent of GDP in the same period. Figure 1 shows the recent evolution of the ratio of total housing loans to GDP in Brazil, while Figures 2 and 3 present the same data for other countries at the end of 2007.

Fig. 1 Brazil: Total Housing Finance/ GDP



[1] A legal and institutional environment that protects creditors under insolvency increases the welfare of both lenders and borrowers.

[2] This plan, which introduced the present currency, the Real, finally ended years of high inflation (at times hyperinflation), interspersed with brief periods of stability as the result of other, ultimately ineffective, economic plans.

Fig. 2 – Total housing finance / GDP - Dec. 2007

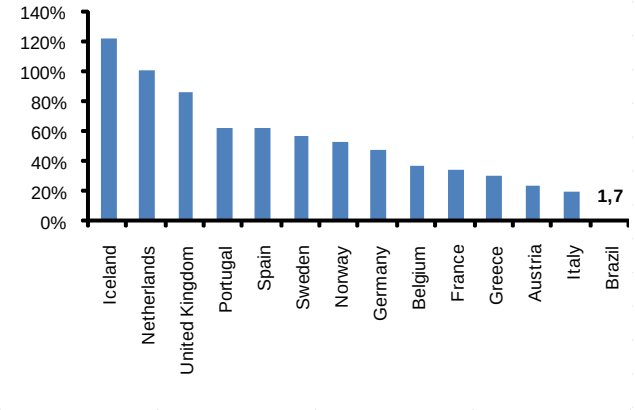
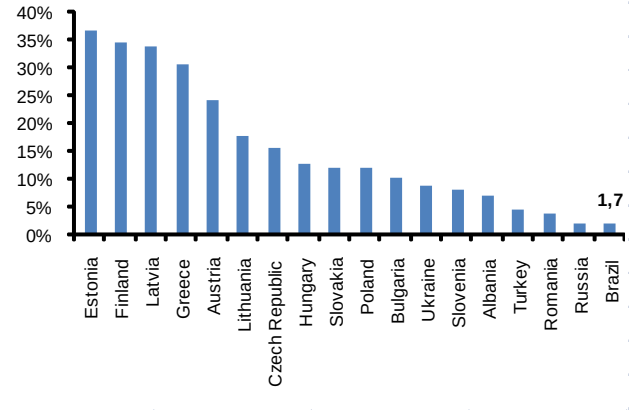


Fig. 3 – Total housing finance / GDP - Dec. 2007



For a better understanding of the underdevelopment of the mortgage market in Brazil, it is necessary to review the macroeconomic and institutional environment experienced by the country throughout the 1980s and early 1990s.

Between 1980 and 1994 the Brazilian economy experienced a period of hyperinflation, where the annual inflation rate reached 1,972 percent in 1989 and 2,477 percent in 1993. The Consumer Price Index (IPCA) reached 757.3 percent in the first half of 1994, or the equivalent of 7,249 percent on an annual basis when the program of stabilization and currency reform (Plano Real) was adopted in July 1994. Figure 4 shows the evolution of inflation (IPCA) between 1980 and June 1994. Nevertheless, the average nominal interest rate (Selic rate - Over) reached 22.76 percent a month between 1980 and June 1994, peaking at more than 60 percent a month in December 1989, as shown in Figure 5. Besides the macroeconomic instability, a weak legal framework limited the development of the mortgage market, since property rights enforcement was neither well defined nor reliable.

Fig. 4: Inflation - IPCA

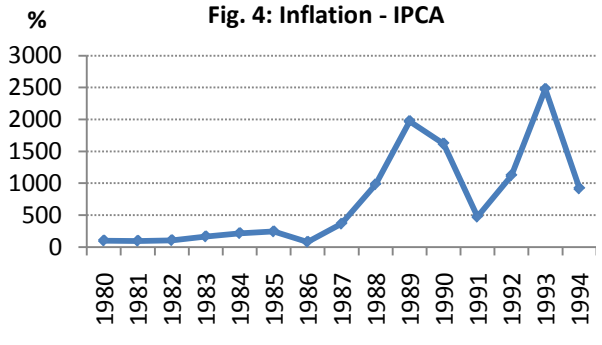
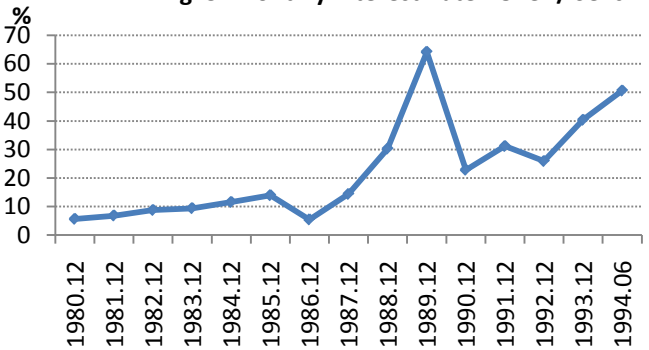


Fig. 5: Monthly Interest Rate - Over / Selic



In this environment of macroeconomic and institutional instability, Brazilian banks had specialized in short-term deposit funding, especially demand deposits, to obtain nominal income from inflation. Additionally, banks' portfolios were basically composed of indexed government bonds and short-term loans. In this context, most of the long-term credit market was driven by official banks or by some earmarking rule, such as mortgage loans.

After the economic stabilization promoted by the Real Plan in June 1994, the government had to deal with the losses and imbalances accumulated in banks' balance sheets during the inflationary period. Several private banks were consequently wound down as insolvent (after spinning off the viable parts), and some big private banks were placed under the temporary special administration regime (RAET), under the Program to Restructure and Strengthen the National Financial System (PROER). Basically, as a consequence of the decrease in the official banks' credit operations, which fell from 20.9 percent of GDP in the first quarter of 1994 to 8.2 percent of GDP in the first quarter of 2003,[3] the total credit to GDP ratio declined from 37.0 percent to 21.8 percent in that period.

In this context, long-term loans and collateralized loans were especially affected. As a result, these types of loans have been basically driven by official banks or by some earmarking rule imposed by the government. Not surprisingly, Brazil still faces a severe housing shortage, especially among lower-income people (Table 1). In absolute terms, according to the Brazilian Institute of Geography and Statistics (IBGE) and using the methodology created by the João Pinheiro Foundation (FJP), the housing shortage[4] reached its peak in 2006 (7,935,000 units). It is very difficult to identify the reasons for the decline observed in 2007 because there was a methodological change in that period, but the

[3] In that period some official banks were closed and some banks owned by state governments were privatized. The state government debt was transferred to the federal government (PROES) and R$ 26.7 billion in non-performing loans (mostly mortgages loans) accumulated on banks' balance sheets during the inflationary period were transferred to Emgea (Asset Management Company) in June 2001.

[4] Following the IBGE database, the housing shortage, regarding the housing conditions, is defined as follows:

a) Rustic households: groups of people living in substandard housing that does not have masonry or lumber-supported walls, constructed with inappropriate materials.
b) Improvised households: people living in structures intended for non-residential purposes, but serving as residence during the housing search.
c) Cohabitation family: the coexistence of more than one family in the same dwelling (families living together), representing failure of the housing stock to meet demand.
d) Rented or donated living space located in residences with many rooms, etc.
e) Excessive rental: more than 30 percent of household income devoted to rental by families earning up to three times the minimum monthly wage.

Besides the housing shortage, IBGE classified around 2 million households(4.2 percent) as living in inadequate residences in 2007, a concept that includes households with too many people in relation to living space (households with more than three people per bedroom), with lack of infrastructure services (households that do not have any one of the following basic services: piped water supply, electricity supply and, sewerage and trash collection), with inadequate landholding (households with residents who say they do not have ownership of the land but only the building)—basically houses built in *favelas*, or shantytowns.

decrease in the housing shortage as a percentage of total households during the decade of 2000 can be seen as a consequence of the development of the housing finance market in recent years, achieved after the economic stabilization and some institutional improvements that enhanced guarantees to lenders (presented in the next section).

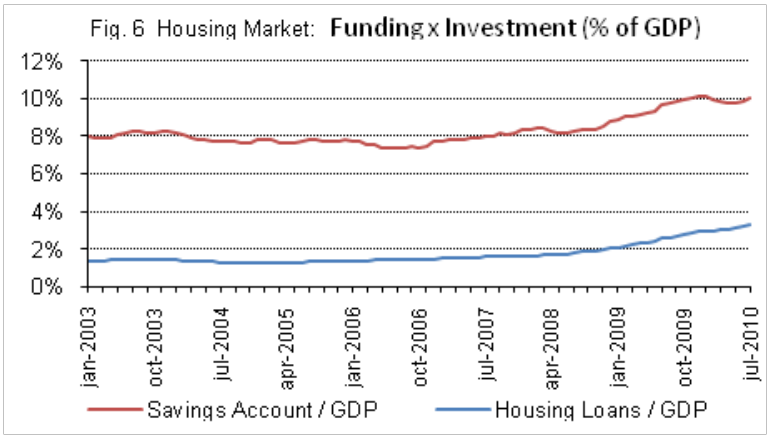
Table 1 Housing Shortage

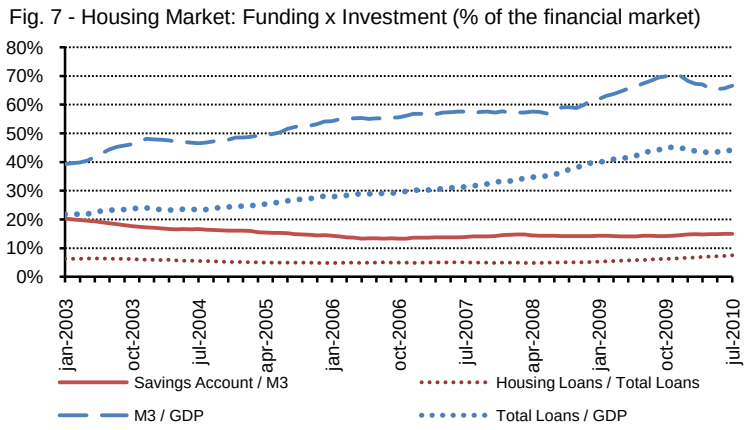
	1991	2000	2005	2006	2007 (1)	2008 (1)
Housing Shortage	**5,374,380**	**7,222,645**	**7,902,699**	**7,934,719**	**6,020,434**	**5,572,313**
Urban	3,743,594	5,469,851	6,414,143	6,543,469	5,003,418	4,629,832
Rural	1,630,786	1,752,794	1,488,556	1,391,250	1,017,016	942,481
As % of households	**15.4**	**16.1**	**14.9**	**14.5**	**10.8**	**10.2**
Urbano	13.8	14.6	14.3	14.1	10.5	9.8
Rural	21.5	23.7	18.2	16.8	9.8	11.5
By income (%)						
Up to 3 minimum wages (SM)	...	82.5	90.3	89.7	89.4	89.6
Between 3 and 5 SM	...	9.4	6.0	6.1	6.5	6.3
More than 5 SM	...	8.1	3.7	4.2	4.1	4.1

Source: IBGE, Pesquisa Nacional por Amostra de Domicílios (Pnad) and Fundação João Pinheiro (FJD)

(1) - Methodological change - Housing shortage for 2007 and 2008 includes the total of families living together but excludes high density rented households.

Despite the observed expansion in the credit market as percentage of GDP since 2003, the recovery of the mortgage market took longer to occur. As a percentage of GDP, the total housing loans and the volume of savings accounts (the main funding source for housing finance in Brazil) began to grow significantly from mid 2005 (Figure 6). But when looking at the same variables as a percentage of some financial system measures, such as M3 and total loans (Figure 7), it can be seen that recent expansion in the housing market follows the growth of the financial market as a whole.





It is important to note that the recent expansion in financial intermediation in Brazil, as shown in Figure 7, which followed a series of macroeconomic and institutional improvements established over the last twenty years, has generated a more stable and reliable economy and, hence, has been especially important for the development of the long-term credit market, including the mortgage market.

Despite the recent expansion, Brazil still faces a severe housing shortage, especially among lower-income people. Nevertheless, expectations of continuing public policies favoring economic stability and compliance with contractual obligations will probably encourage the development of this market. Thus, we believe that it is of great importance to examine the development, limitations and prospects of this sector in Brazil.

This paper investigates the recent evolution of the Brazilian housing finance market, focusing on whether the current expansion in mortgage lending is the result of institutional and economic improvements or is merely an effect of the higher level of housing loans imposed by the government on financial institutions.

The paper is organized as follows: Section 2 presents a historical survey of the sector's regulatory and institutional environment in Brazil; Section 3 presents a descriptive analysis of the recent evolution of mortgage lending in the country; Section 4 discusses the econometric exercise and results; and Section 5 concludes.

2. Institutional Framework

The structure of housing finance in Brazil is characterized by two major pillars: the establishment of the Housing Finance System (*Sistema Financeiro de Habitação,* SFH) in 1964, and the Real Estate Financing System (*Sistema Financeiro Imobiliário,* SFI) in 1997.

Law 4380 of August 21, 1964 created the SFH and the National Housing Bank[5] (BNH) and established the use of inflation indexation of mortgages. The SFH is still the primary source of housing loans in Brazil. Its funding comes from earmarking a portion of passbook savings deposits held by banks to make housing loans at interest rates controlled by the government. To protect borrowers against increases in payments greater than their wage increases, the now-defunct BNH created the Wage Equalization Plan (PES) in 1967, with the assurance that the adjustment could not exceed the wage increases, leaving the coverage of any debit balances arising from different frequencies and indices of adjustment (salaries and contracts) to the Wage Variation Compensation Fund (FCVS).[6]

The SFH brought impressive results during the years previous to hyperinflation, financing more than 5 million homes with resources from passbook savings accounts and the Severance Indemnity Guarantee Fund (FGTS).[7] From the 1980s on, with escalating inflation, the SFH began to show signs of exhaustion, and in the years between 1987 and 2000 accounted for only 14.7 percent of new housing loans, in comparison to 33.8 percent in the period from 1967 to 1986. The main reason for the low level

[5] Decree-Law 2291 of November 21, 1986 extinguished the BNH, transferring its regulatory functions to the Brazilian Central Bank and its executive and fund managerial functions, including FCVS balance, to Caixa Econômica Federal, a federally owned savings and loan institution.

[6] Because of high and unpredictable inflation, a comprehensive system of indexing wages and debts was created throughout the economy. However, there was a risk to borrowers that the index used to adjust debt balances might not be the same as that used to adjust their wages, and more important, the timing of the two adjustments might not coincide, leaving them at risk of facing a sudden rise in loan obligations as a percentage of wages. Mortgage payment increases were therefore limited so that the obligation could not rise as a percentage of salary. This meant that in some months the outstanding principal increased. The coverage of any remaining debt by the FCVS guarantee was abolished after the issuance of Provisional Measure 318 of March 24, 1992 (converted into Law 8692 on July 29, 1993), which created the Wage Commitment Plan (PCR), limiting the debt balance adjustment to the wage variation.

[7] Law 5107 of September 13, 1966 created the FGTS, a compulsory savings fund to protect workers in case of unemployment (and to create a source of funding for loans from official banks). Employers must deposit 8 percent of each worker's pay into a blocked account held in name of the worker at Caixa Econômica Federal. The worker can only access this account balance upon dismissal without cause (layoff), retirement or in some other cases, such as to make a down payment on a home.

of funding by the SFH in this period was the imbalance of the FCVS, which still accumulated on the financial institution's balance sheet. In fact, the FCVS is a balance of non-performing housing loans that must be paid by the government and can be used by financial institutions to satisfy their real estate earmarking parameters. In practice, it constitutes a strong restriction on the implementation of new operations.[8]

Another important improvement in the Brazilian mortgage market was the enactment of Law 9154 of November 20, 1997, which created the SFI and the real estate fiduciary assignment device (a trust deed arrangement), reducing the lending risks for financial institutions. Because the property remains in the name of the lender until repayment, the lender has greater legal security compared to the previous rules on mortgages.[9] With the creation of the SFI, the government established more a flexible basis for real estate contracts and regulated the functioning of a secondary market, seeking thereby to enable new alternatives for funding housing loans.

Among the provisions of Law 9514, the most important here is the creation of the legal figure of the real estate securitization company, organized as a corporation. The corporate purpose of the securitization company must entail the acquisition of housing credits from financial institutions. These credits are turned into securities, designated Real Estate Receivables Certificates (*Certificados de Recebíveis Imobiliários*, CRI), a nominative credit instrument backed by housing loans, allowing the securitization of mortgage pools.[10] The fiduciary assignment regime applies again, allowing separating the assets of the securitization company and of the investor. For investors in CRIs, the fiduciary assignment regime provides additional security because it means the establishment of a separate asset, which is not tied to other obligations of the securitization company, even in relation to other CRI emissions.

Although it added some important improvements in the SFH structure, the SFI did not meet its initial expectations, especially in its early years. In response, the government issued two provisional

[8] The FCVS deficit was estimated at R$107 billion at the time of its debt and responsibilities renegotiation (Law Nº 10,150, dated December 21, 2000).

[9] In order to protect mortgagors against foreclosure in a period of high inflation and housing market crisis, the government enacted Law 8009 of 30 March 1990, which established homestead immunity. While properties financed by the SFH (Article 3) are excluded from protection, this law's indiscriminate application by the judiciary had been hindering foreclosure of mortgages, discouraging new housing loans.

[10] These certificates can be used to comply with some requirements as well as to meet the earmarking rule, even for operations under the SFH. The CRI must be covered by real estate credits and only can be issued for the purpose of acquiring real estate loans. The Certificate of Securitization is the document that makes the link of the guarantee (real estate credits) to the CRI that must be registered in the CETIP clearinghouse, the Brazilian Securities Commission (CVM) and in the local real estate registry office for the case of CRIs subject to the trust deed (fiduciary assignment) regime.

measures[11] at the end of 2001 to address some of these problems. Provisional Measure 2221 created a legal device to ringfence real estate development projects, called "equity separation" (*patrimônio de afetação*), which segregates the assets and liabilities involved in a specific project from the developer's total assets and liabilities, thereby reducing the risk to buyers of properties yet to be built[12] and to lenders.[13] Provisional Measure 2223 created two new mortgage-backed securities, Real Estate Exchange Bills (LCI) and Real Estate Credit Bills (CCI), expanding the funding alternatives for mortgage lenders.

Law 10,931 of August 2, 2004, besides incorporating the advances of Provisional Measures 2221 and 2223, modified the Brazilian Civil Code (Law 10,406 of January 10, 2002) to definitively include the legal figure of fiduciary assignment (trust deed arrangement) in real estate mortgages in the Brazilian legal system. It also assured that undisputed balances must be paid under the contracted terms and forms and that only disputed balances can be suspended in lawsuits (either foreclosures by lenders or suits by borrowers challenging loan terms), although the debtor must deposit the corresponding disputed amount with the court. Among other provisions, Law 10,931 also created the Bank Credit Note and allowed tax relief on real estate securities, which have been exempt from income tax since August 2004. By creating these new securities and reducing the legal risks to lenders, Law 10,931 increased the liquidity to traditional housing finance, allowing the loans under the SFH to be securitized and traded under the SFI, creating in practice a "bridge" between the two systems.

However, there was still the problem of the legacy of debts from the FCVS ("skeleton"). This solution came with Law 10,150 of December 21, 2000, which regulated the conversion and rescheduling of debts of the FCVS. Later, National Monetary Council (CMN) Resolution 3005 of July 30, 2002 established that FCVS credits novated under Law 10,150 shall continue to be counted as housing finance until the month following the novation, as well as the funding amounts negotiated under the Program to Restructure and Strengthen the National Financial System (Proer)[14] until the month after the resolution took effect. After that, the amounts computable as housing credits (FCVS novated credits and virtual credits of Proer) are reduced by 1/100th each month. CMN Resolution 3177 of March 8, 2004, accelerated the decay to 1/50th per month, while CMN Resolution 3347 of February

[11] The president has authority to issue provisional measures (*medidas provisórias*), which take effect as ordinary law immediately but are subject to later congressional approval and amendment.

[12] Because of the shortage of credit for construction, a system was developed whereby purchasers of new homes and apartments start paying in advance of construction.

[13] This change was adopted after a leading nationwide real estate development company went bankrupt, even though many of its projects were not facing problems.

[14] A program that cleaned up the banking system, under which the federal government took over distressed banks and then sold off the healthy parts and also promoted mergers between weak and strong banks.

8, 2006 accelerated to 1/36th the decrease in the use of FCVS to comply with the real estate earmarking rule, aiming to further expand the credit supply to the real estate sector. Moreover, since CMN Resolution 3l77, funds held by banks as required reserves with the Central Bank earn 80 percent of the "reference rate" (TR) instead of 100 percent. Table 2 shows the main normative instructions regarding the earmarking rule for housing loans since 1993.

Table 2 – Normative Instructions

Normatives	Requirements	Real Estate Finance
Resolution no 1,980, 4/30/1993	15%	70% (1)
Resolution no 2,088, 6/30/1994	20%	70% (1)
Resolution no 2,106, 8/31/1994	30%	70% (1)
Resolution no 2,190, 8/23/1995	15%	70% (1)
Resolution no 2,458, 12/18/1997	15%	70% (2)
Resolution no 2,519, 6/29/1998	15%	70% (3)
Resolution no 2,623, 7/29/1999	15%	60% (3)
Resolution no 2,706, 3/30/2000	15%	65% (3)
Resolution no 2,968, 6/24/2002	20%	65% (3)
Resolution no 3,005, 7/30/2002	20%	65% (4)
Resolution no 3,177, 3/08/2004	20%	65% (5)
Resolution no 3,347, 2/08/2006	20%	65% (6)

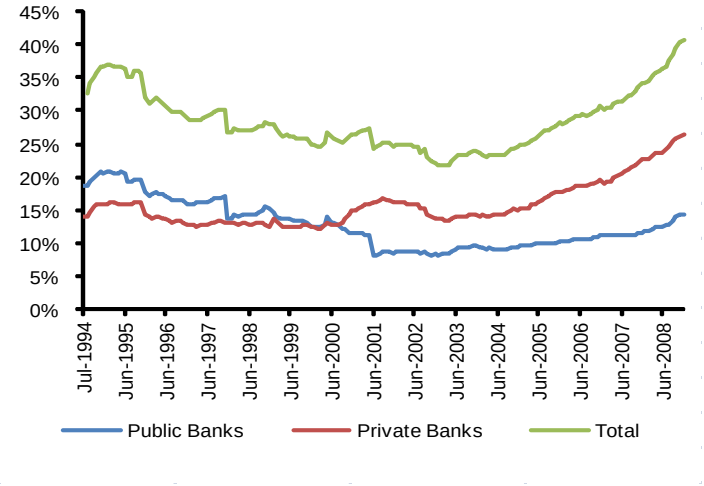
Remarks:

(1) At least 80% must be invested under the SFH system; the rest can be allocated at market rates.
(2) At least 30% and 50% must be invested under the SFH and the Special Housing Credit Track, respectively; the rest can be allocated at market rates, as long as at least half is in real estate finance transactions.
(3) At least 80% must be invested under the SFH system; the rest can be allocated at market rates, as long as at least half is in real estate finance transactions.
(4) At least 80% must be invested under the SFH system; the rest can be allocated at market rates – with a reduction of 1% of FCVS credits.
(5) (5) At least 80% must be invested under the SFH system; the rest can be allocated at market rates – with a decay of 1 / 50 of FCVS credits.
(6) (6) At least 80% must be invested under the SFH system, the rest being allocated at market rates – with a decay of 1 / 36 of FCVS credits.

3. Descriptive Analysis

The process of macroeconomic stabilization, starting with the adoption of the Real Plan in 1994, brought a more favorable environment for credit growth in Brazil. However, due to some specific retraction periods, explained mainly by some domestic and international macroeconomic uncertainties, the credit boom only started consistently after mid-2003 (see Figure 8). The volume of credit to the private sector (individuals and firms) jumped from R$ 388.6 billion in June 2003 (23.0 percent of GDP) to R$ 1,209.5 billion in 2008 (40.3 percent of GDP). Interestingly, to some degree as a result of reorganization and privatization of some government owned institutions, credit expansion was higher in private institutions compared to official ones. The share of private banks in total loans grew from 42.6 percent in July 1994 to 60.7 percent in June 2003 and to 64.5 percent in November 2008.

Fig. 8 – Total Credit (% of GDP)



Such growth is primarily the result of a series of macroeconomic and institutional improvements that have been achieved over the last 15 years, making for a less volatile and therefore a more encouraging environment for the housing finance market. In spite of these advances, since June of 1994 (see Figure 9) growth of housing loans has not kept pace with growth of lending to other sectors of the economy, even disregarding the bad loan transfer from the mortgage portfolios of state-owned banks to the Asset Management Company (Emgea), a federally owned company under the auspices of the Finance Ministry. This explains the sharp drop in 2001.

Fig. 9 – Total Credit (% of GDP)

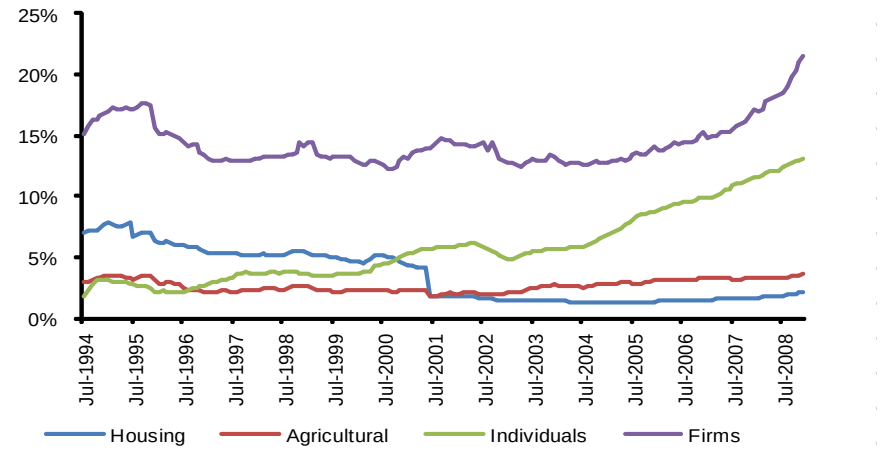
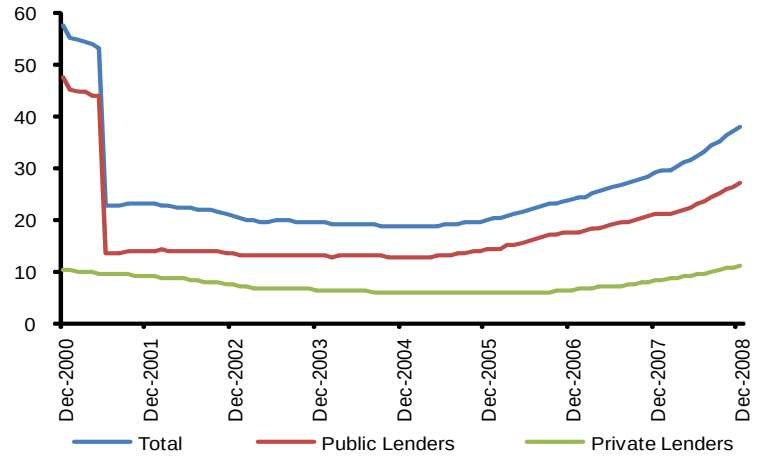


Figure 10 shows that the SFN stock of loans (at June 2001 prices) only began to show steady growth from mid-2005, with the balance of these credits amounting to R$ 61.8 billion at current prices (2.1 percent of GDP) in November 2008, an expansion of 37.7 percent over the preceding twelve months. This recent growth is led by loans from official financial institutions, whose operations totaled R$ 43.9 billion at current prices (1.5 percent of GDP) in December 2008. However, housing loans by private financial institutions also reacted, growing by 44.2 percent during the 12-month period ending in November 2008 and reaching R$ 17.9 billion at current prices (0.6 percent of GDP).

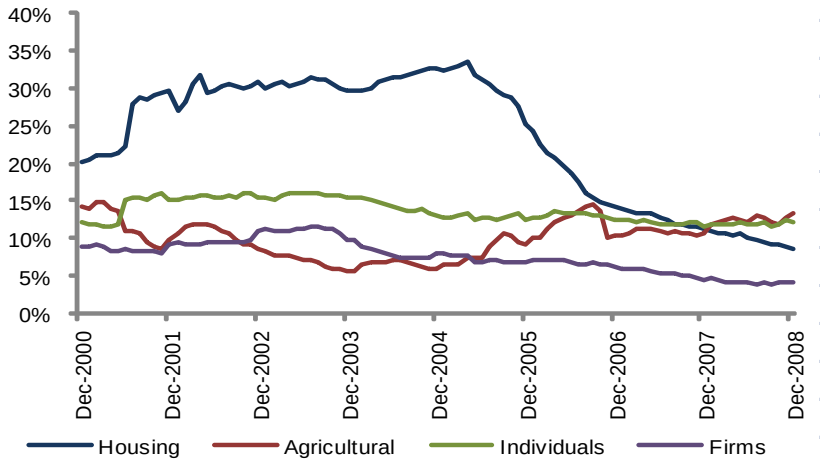
Fig. 10 – Total Housing Credit (R$ billions at June, 2001)



An important aspect is to identify whether the recent growth of housing loans in Brazil is a result of the institutional and economic improvements or merely the outcome of the higher level of housing loan requirements imposed by the earmarking rules on financial institutions' operations, reflecting the increase of funds held in passbook savings accounts, the gradual exclusion of FCVS credits determined by the CMN Resolution 3005 of 2002 and the lower return on reserve funds deposited with the Central Bank (CMN Resolution 3177 of 2004).

Regardless of this explanation, it is important to highlight the improvement in the risk associated with these portfolios. Observing the operations classified as risk levels 1 plus 2,[15] that is, those more than 60 days in arrears and whose classification, based on CMN Resolution 2682 of 2002, ranges from D to H, housing finance portfolio risk has declined significantly since mid-2005, becoming lower than that of agricultural loan portfolios (see Figure 11).

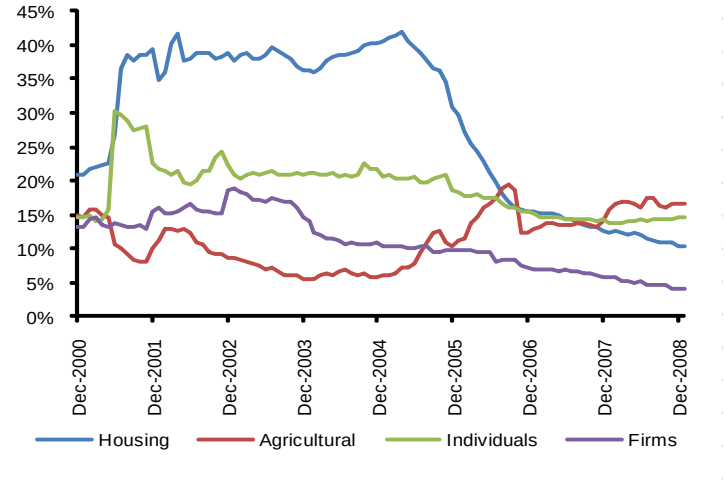
Fig. 11 – Credit Risk (risk 1 + 2)



[15] Up to February 2000, the credit risk measures typically followed the measurement scheme provided in CMN Resolution 1748 of 1990, which were based exclusively on the time of default, ignoring the potential risk of the borrower. Thus, the credit operations were classified into three risk levels: i) normal risk (loans no more than sixty days behind); ii) delinquent, or risk 1 (between 61 and 180 days behind); and iii) under liquidation, or risk 2 (loans more than 180 days behind). In March 2000 (CMN Resolution 2682), the credit classification changed to a system with nine risk levels, in growing order: AA, A, B, C, D, E, F, G and H, segregated by economic activity segment and its loan loss provision. Therefore, adding the insolvency criteria, the financial institution must consider, among other factors, the debtor's financial situation, indebtedness, economic activity sector, credit limits, credit operation nature, guarantees and the credit amount. For loans to individuals, the factors considered are income, wealth and credit history.
The credits are classified, at least, on the same level of risk corresponding to the delay: i) between 15 and 30 days, risk level B; ii) between 31 and 60 days, risk level C; iii) between 61 and 90 days, risk level D; iv) between 91 and 120 days, risk level E; v) between 121 and 150 days, risk level, F', vi) between 151 and 180 days, risk level G; and vii) above 180 days, risk level H. In order to reconcile and harmonize the time series data with the criteria of CMN Resolution 1748, the credit operations were classified into three risk levels: normal (levels AA to C), risk 1 (levels D to G) and risk 2 (H).

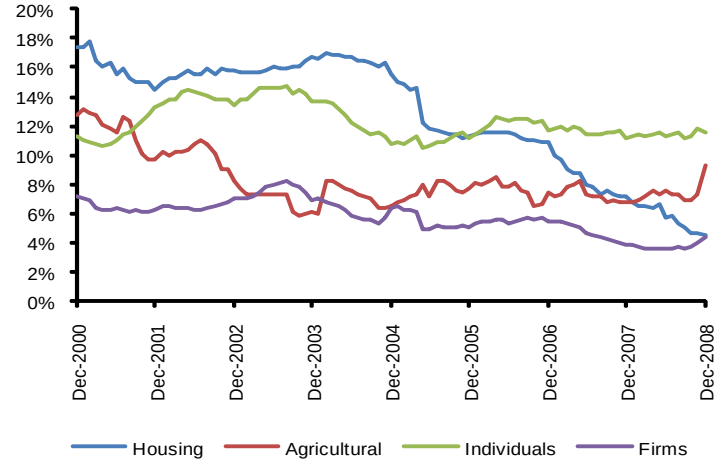
An analysis of credit risk indicators shows different behavior between the portfolios of official (public) and private financial institutions (Figures 12 and 13), although both point in the same direction. The credit risk assumed by official lenders is higher; especially the risk involved in housing finance, where the percentage of risk 1 and 2 was above 40 percent of the portfolio and still remains above 10 percent (Figure 12).

Fig. 12 – Credit Operations - Public Lenders (risk 1 + 2)



On the other hand, the levels of arrears observed in the portfolios of private financial institutions are much smaller and more stable. Risks 1 and 2 of housing credit portfolios, after reaching levels above 15 percent until the end of 2004, fell sharply to 5 percent, approaching the risk observed in business loans (Figure 13).

Fig. 13 – Credit Operations - Private Lenders (risk 1 + 2)



To better understand the recent behavior of the housing finance market in the Brazilian economy, it is important to review the legal framework governing the earmarking rule imposed on financial institutions that take passbook savings deposits.

For every Real received for deposit in savings accounts, banks must direct 65 cents for housing finance, with 80 percent of this value in loans under the SFH (whose interest rates are limited to 12 percent a year plus the TR[16]), and the rest in loans at interest rates freely set.[17] It should be noted that there are some weighting criteria for compliance with these rules.[18] Furthermore, the balances of loans from the FCVS are also utilized to meet these requirements.[19] If the invested resources are less than what is required by the earmarking rule, the non-invested amount must be deposited within the Central Bank of Brazil, bearing interest based on the TR. Between March 8, 2004 and March 27, 2008, non-invested resources earned only 80 percent of the TR, generating losses for financial institutions.

Another relevant aspect to consider is the institutional framework governing mortgage contracts. We highlight three important facts that have changed the design of mortgage contracts in Brazil: Decree 2291 of November 21, 1986, which extinguished BNH and established the use of inflation adjustment of housing loans under the system; the creation of the Wage Commitment Plan (PCR), which became law on July 28, 1993 and eliminated the FCVS guarantee of debt remainders from contracts signed after publication of Provisional Measure 318 of March 24, 1992; and the enactment of Law 9514 of November 20, 1997, which created the SFI and the trust deed mortgage arrangement, thus reducing the credit risks to which financial institutions are exposed. Moreover, also worth mentioning is the issuance of Provisional Measure 1671 of June 24, 1998, which in general changed the monthly charge adjustment provided by Law 8692 of July 28, 1993. In this sense, we can separate housing finance contracts into three groups, which differ basically by the rules on adjustment of charges and the legal environment in which they were originally written and therefore generate different incentives for the contracting parties.

With this institutional environment, some conclusions may be advanced. First, the return on savings deposits compared to fixed income funds and of bank deposit certificates (CDBs) is negatively

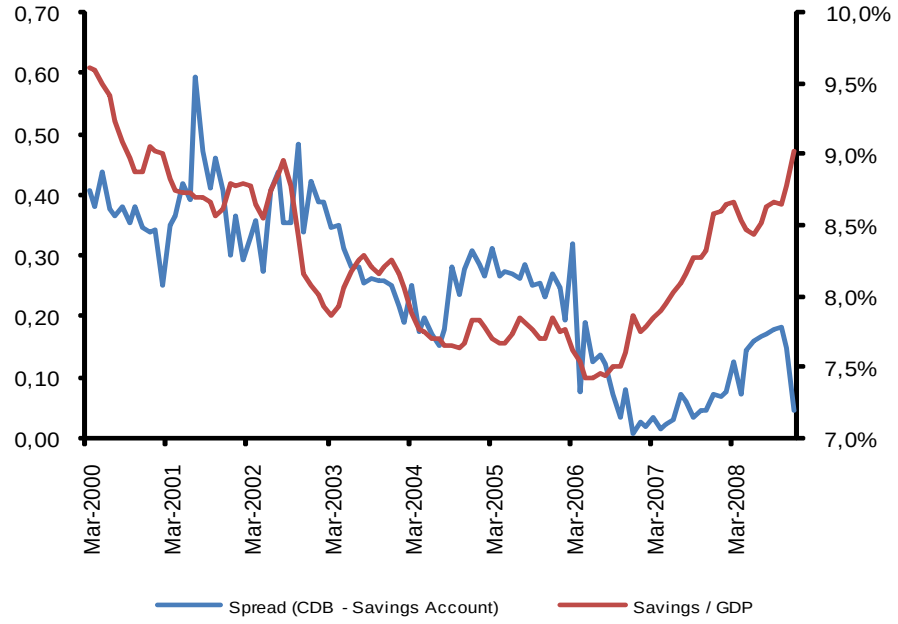
[16] Law 8177 of March 1, 1991 replaced inflation adjustment by the Daily Reference Rate (TRD) on all SFN contracts. This was later replaced by the TR in May 1993 (Law 8660).
[17] This rule came into effect in June 24, of 2002. Table 1 shows the proportion charged in previous years.
[18] All financial institutions belonging to the Brazilian Saving and Loans System (SBPE) can use the following weighting criteria:

a) 1.5 for properties valued between R$80 thousand and R$100 thousand, under SFH rules;
b) 1.2 for CRI investments, limited to 5 percent of the total requirements;
c) 1.5 for investments at free market rates, under the equity ringfencing regime.

[19] Table 1 shows some normative instructions that have changed the parameters accepted to meet the requirement.

related to the level of the Selic (benchmark) rate. This is due to the quasi-fixed behavior of savings account return (6 percent per year plus the TR) and because the return on fixed-income instruments and CDBs is highly correlated with the Selic rate. In this sense, it is expected that reductions in the Selic rate should be followed by increases in savings deposits, generating increased funds for housing finance. Figure 14 shows the evolution of the spread between the average net return[20] of CDBs and savings deposits and the evolution of the savings deposits to GDP Ratio since March 2000.

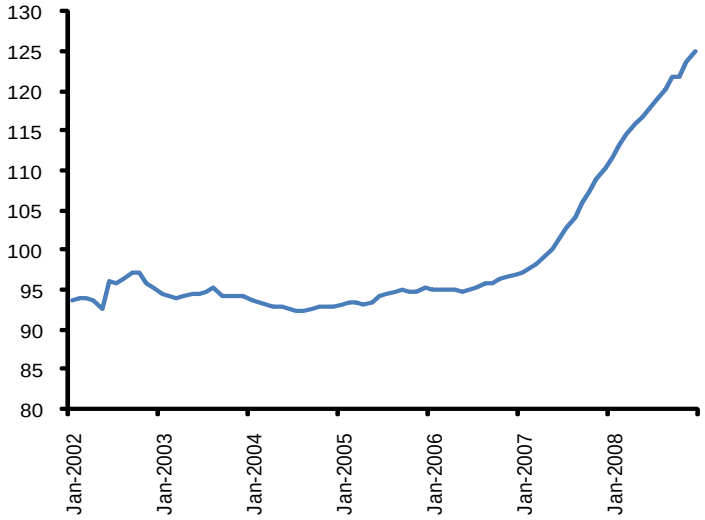
Fig. 14 – Evolution of Savings Account Deposits



It can be seen that the return on passbook savings accounts has been getting closer to the CDB yield recently, leading to a gradual increase in the balance of savings accounts as a proportion of GDP. As a consequence, the balance of funds that must be used for mortgage lending has increased considerably in recent years, as shown in Figure 15.

[20] Considering a 20 percent income tax on profit and not adding the management fee charged by banks on these funds.

Fig. 15 – Total Requirements (in R$ billions)



This scenario of a sharp increase in requirements due to the significant increase of savings account deposits may produce important impacts in the Brazilian banking market in the years ahead. The possible existence of a type of cross-subsidy to mortgage lending, because banks are required to direct an increasing share of their funds to this modality, whose interest rates are generally limited to 12 percent a year, may restrict credit to other modalities or sectors, both in quantity and prices (spread). If growth of demand lags behind growth of supply, some institutions may end up giving credit to customers with higher risk or to those who would not have access to these resources in an environment of normal expansion, increasing the likelihood of future default.

Therefore, it is essential to carefully observe the recent evolution of mortgages in arrears. Figure 16 below shows the evolution of default rates by risk classification, where the basis for the calculation of total credit refers to the equivalent preceding period. That is, the basis for default more than 15 days (risk ≥ *B*) is the total balance of credit with one period of delay, more than 60 days (risk ≥ *D*) is the total balance of credit with two periods of delay, and over 90 days (risk ≥ *E*) is the total balance of credit with three periods of delay.

Fig.16 – Default by Credit Risk Grade

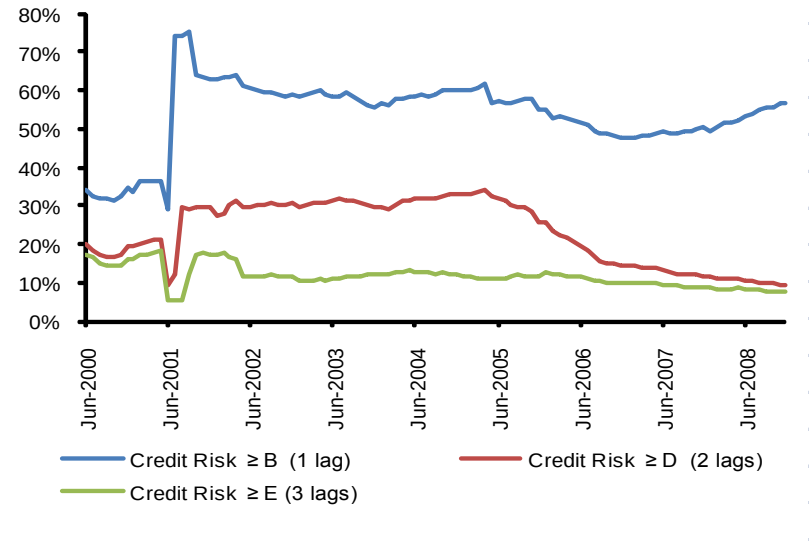


Figure 16 additionally provides cause for concern. Although the loans with risk ratings worse than D and E have been trending downward, the percentage of loans with a grade higher than B has begun to show an upward trend, which may lead to higher default levels in the near future. Figures 17, 18 and 19 below show the evolution of default rates by bank ownership.

Fig. 17 – Default by Bank Ownership (Risk ≥ E)

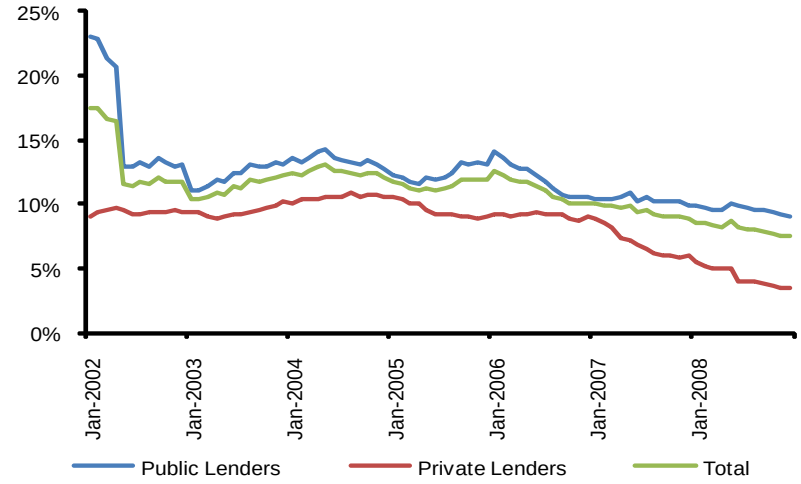


Fig. 18 – Default by Bank Ownership (Risk ≥ D)

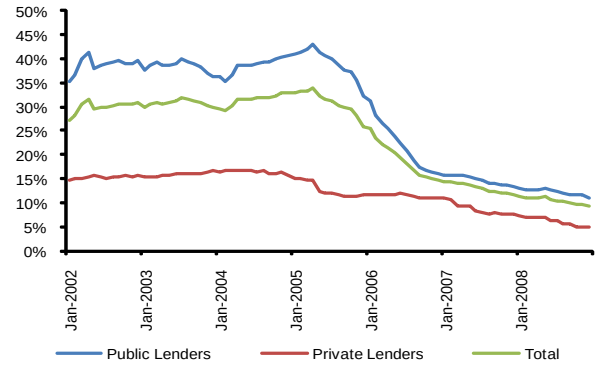
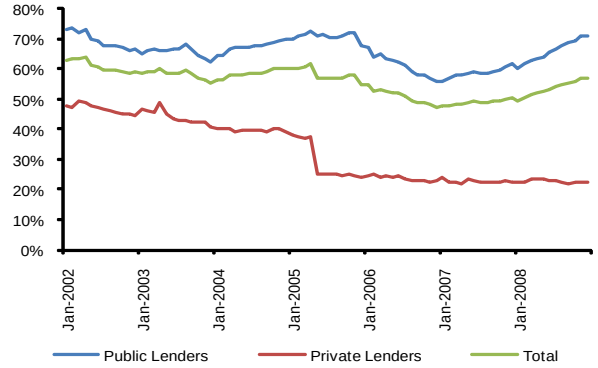


Fig. 19 – Default by Bank Ownership (Risk ≥ B)



First, there is higher percentage of arrears in public banks' portfolios. However, this percentage has fallen substantially to risk ratings higher than D and E since 2005. Second, the percentage of credit rating above B shows a constant trend in private institutions[21] and a clear upward tendency for public institutions. This distinct behavior by ownership may be related to different market niches in which these institutions operate, according to criteria such as the social class of their respective customers.

Another important point is the decline in the proportion of contracts prior to June 1998 in bank portfolios. As previously mentioned, the great majority of these contracts are not subject to the trust deed rule created by Law 9514 of November 20, 1997, which, as explained in Section 2, retains property ownership in name of the lender, providing greater legal security to mortgage lending compared to mortgage contracts under the old rules. Figures 20 and 21 below show the development of the percentage of real estate contracts signed before and after June 1998 with arrears greater than three months.

Fig. 20 – Proportion of contracts signed up to June 1998

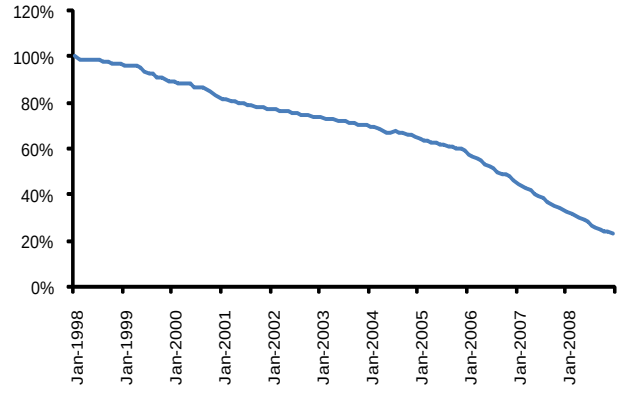
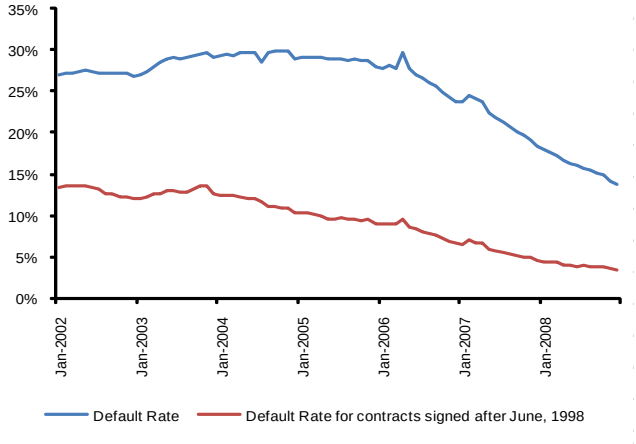


Fig. 21 – Default Rate



[21] The fall observed in April 2005 reflects a change of the risk classification of a big private institution.

It can be seen that mortgage contracts signed after June 1998 have a much lower percentage of default than overall contracts. Based on a default measure of the number of contracts more than three months behind in relation to the total number of contracts, the evolution of default rates between official and private banks for contracts established after June 1998 is as follows in Figures 22 and 23.[22]

Fig. 22 – Default Rate - Public Lenders

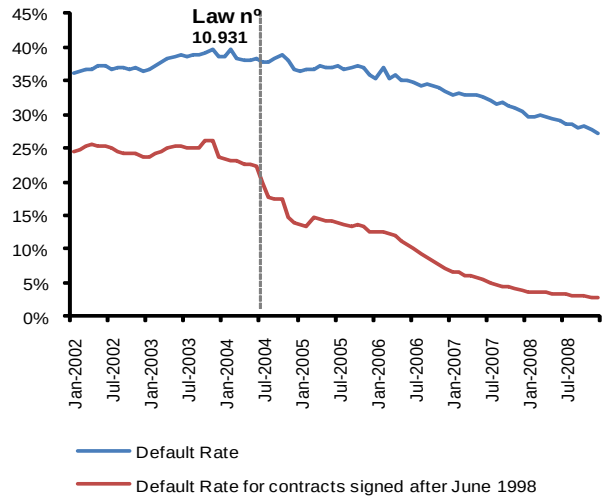
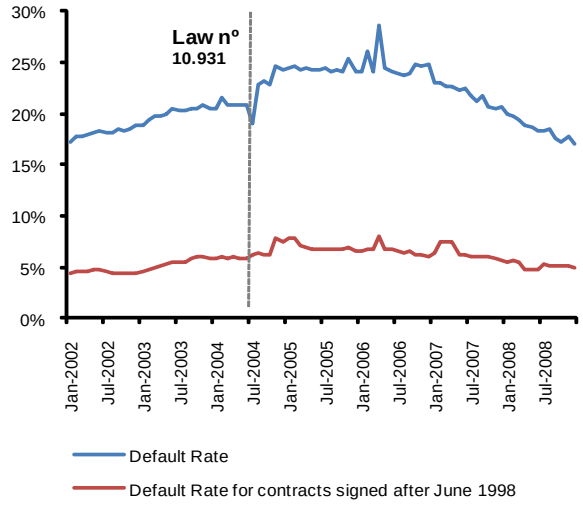


Fig 23 – Default Rate - Private Lenders



As the figures show, the default rate for contracts signed after June 1998 from public lenders has been consistently falling since mid-2004, approaching the amount overdue in private institutions' portfolios, in which the default rate remained fairly constant over the period under analysis (about 5 percent of contracts).

A possible explanation for such dynamics is the difference of profiles between the borrowers from public and private institutions. The economic stability achieved in recent years (with increasing gains in real income and employment levels), coupled with the enactment Law 10931 of 2004, which definitively added to the Brazilian legal system the concept of the trust deed arrangement on mortgages, may have generated greater reductions in risk (reducing default rates) in operations contracted by low-income customers. In this case, the data reflect the fact that public institutions are more active in housing finance for low income classes. In fact, Caixa Econômica Federal, the largest public institution with a housing loan portfolio, always has focused on people of lower classes compared to privately owned institutions.

[22] The data are published by the Department for Monitoring the Financial System and Information Management (Desig). The data report the number of loans more than three months behind by loan origination period (contracts prior to February 1986, between February 1986 and July 1993 and between July 1993 and June 1998). Therefore, they do not reflect financial losses from bad loans, but only the percentage of loans in arrears.

In addition to recent improvements in the housing credit risk observed in the data, another remarkable point is the recent expansion in the credit balance and requirements of this type of credit. Figures 24, 25 and 26 show the evolution of the net requirements (excluding the FCVS balance accepted to meet the earmarking rule) and the effective housing loans (credits under the SFH plus credits at market rates) between official and private financial institutions.

Fig. 24 – Net Requirements and Total Housing Loans

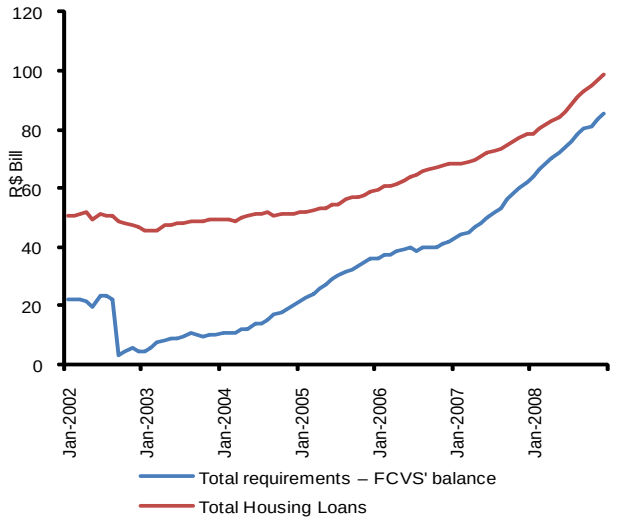


Fig. 25 – Net Requirements and Total Housing Loans - Public Lenders

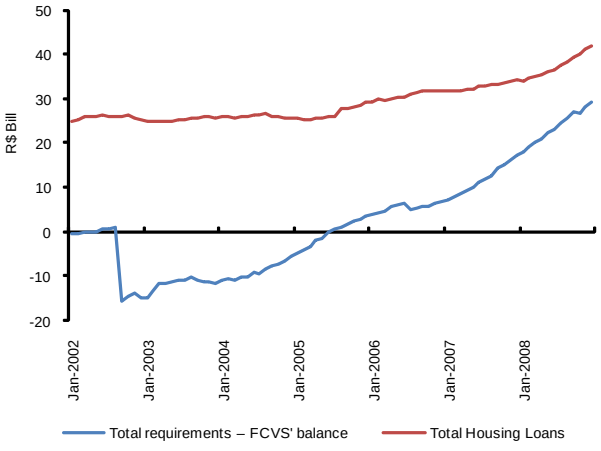
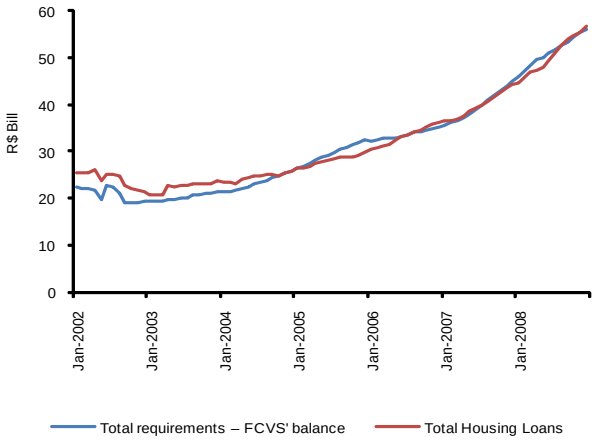


Fig. 26 – Net Requirements and Total Housing Loans - Private Lenders



Note that the expansion of housing loans seems to follow the behavior of the net requirements. And this perception is even stronger in private institutions, whose investments strictly follow the requirements imposed by the earmarking rules. Official lenders have some leeway in fulfilling the requirements, although the difference has significantly decreased in recent years.

To some extent the data presented in this section indicate that the recent expansion in housing finance has basically been driven by the earmarking rule, coming from growth of savings deposits, where the return is approaching that of fixed income investments (generated by the gradual decrease of the Selic rate, which in turn reflects the consolidation of macroeconomic stability). However, doubts persist about whether financial institutions would satisfy the requirements if recent institutional reforms and economic stabilization had not occurred.

On the other hand, the recent fall of mortgage default rates can be seen as a consequence of the economic stabilization and the important institutional improvements, such as Law 10,931 of 2004, whereby lenders retain ownership of the property until the mortgage is paid off.

To shed more light on this process, we apply an empirical exercise in the next section.

4. Empirical Strategy

4.1 Database

We use monthly data covering the period between January 2002 and December 2008. This interval choice is justified because it already covers the important legal reforms related to the housing market previous to 2002, such as the regulation of FCVS balance and the implementation of equity separation, along with the quasi "nonexistence" of this type of credit before 2002, which could distort the results.

The database is composed mainly of statistics on the SFH and the Brazilian Saving and Loans System (SBPE).[23] All real variables were adjusted by the IPCA (consumer price index). The monthly GDP data were obtained from the Brazilian Central Bank and the data on income, employment and unemployment in the metropolitan region of Sao Paulo and consumer prices were obtained from the Institute of Applied Economic Research (IPEA), available at the website www.ipeadata.gov.br.

[23] The data are published monthly at the website: http://www.bcb.gov.br/?SFHESTAT and are collected and monitored by the Department for Monitoring the Financial System and Information Management (Desig) and the Department of Banking Operations (Deban) of the Brazilian Central Bank. We are grateful to Walter Roberto Cirillo Junior and José Luiz Pozo Barnetche, both members of Desig, and Wilson Costa Marinho Filho of the Department to Control Supervision Management and Planning (Decop), for help with obtaining the data. The SFHESTAT data are provided by the SBPE financial institutions and follow Central Bank Circular 2466 of August 18, 1994, which contains consolidated rules on reporting data and use by banks of savings account deposits.

4.2 Econometric Specifications

As the prices (interest rate and charge adjustments) of mortgage contracts under the SFH are regulated by the government[24] and represent the majority of housing loans in Brazil, we estimate only two reduced form models: one model for total stock of housing loans[25] and one for the credit risk[26] of these operations. The purpose of this exercise is not to identify an isolated demand or supply effect, but to investigate which factors have mostly driven the housing finance market and to quantify the total impact of an important institutional reform introduced in August 2004 (Law 10,931) on Brazilian the housing market. In this sense, we evaluate whether the recent expansion of housing loans and the decrease in their credit risk relative to other lending operations are the outcome of a higher level of housing loans imposed by the real estate earmarking rules and/or reflect the economic stabilization achieved in recent years, rather than improvements in the legal guarantees to foreclosure in case of default generated by Law 10,931.

The model estimated for volume of housing loans is:[27]

$$\begin{aligned}\Delta \ln(\text{Real\_HousingLoans}_t) &= \beta_0 + \beta_1 \Delta \ln(\text{Real\_Requirements}_t) + \beta_2 \Delta \ln(1 + Selic_t) \\ &+ \beta_3 \Delta \ln(1 + default\_rate_t) + \beta_4 \Delta \ln(employment\_index_{t-1}) + \beta_5 \Delta \ln(income_{t-1}) + \beta_6 \Delta \left(\frac{credit}{GDP} \right)_{t-1} + \\ &+ \alpha_1 Law10931_t + \alpha_2 dummy\_80\%_t + \varepsilon_t \end{aligned} \quad (1)$$

where *Housing_Loans_Real* is the total housing loans made to satisfy the requirements; *Requirements_Real* are the volume of housing finance required by the earmarking rules minus the balance of FCVS credits accepted as housing loans, both in real terms; *Selic* is the benchmark interest rate, *default* is the number of loans more than three months behind divided by the total number of loans (with three lags); *employment* is the employment rate, *income* is the real income (average per employed

[24] The interest rate charged on housing loans under the SFH is limited to 12 percent a year plus the TR. Provisional Measure 321 of September 12, 2006 added the Article 18-A to Law 8177 of March 1, 1991, since September 13, 2006 allowing mortgage contracts funded by savings deposits also to be offered at fixed interest rates, i.e., without updating by the TR, as was previously required. Law 8692 of July 28, 1993 already had set a limit to the effective (real) interest rate on housing loans under the SFH at 12 percent a year.

[25] This balance refers to the accepted value to meet the requirements. Therefore, it is not the amount actually used to make housing loans since there are different weighting factors for some contract specifications.

[26] We use the proportion of loans more than three months behind as a measure of credit default rates because this measure allow us to verify the behavior of contracts signed after June 1998 (this database separates the contracts by this period). Observe that this credit default measure does not consider the financial value of these contracts. Thus, it does not reflect the potential loss of banks' mortgage portfolios

[27] We included in the model one lag of the dependent variable, which was statistically not significant.

person), *credit/GDP* is the ratio of total credit of the Brazilian financial system to GDP; and *Law10931* and *dummy_80%* are binary variables for Law 10,931 and CMN Resolution 3177,[28] respectively.

As housing credit is relatively low in the Brazilian economy, we believe that possible endogeneity between the total housing loans and the Selic rate is negligible, also eliminating the problems of potential endogeneity between total credit and the requirements.

The coefficient of interest is α1. The idea is to capture the impact of Law 10,931 on total housing loans. On the demand side, the interest rate charged on mortgages under the SFH is not affected by shifts in the credit supply. The law could have reduced the demand for housing loans, by discouraging deadbeat borrowers (those with no intention of repaying loans) from applying in the first place because of the closing of legal loopholes that previously enabled them to remain in possession of the financed property. On the other hand, the law could have increased the housing credit supply because of the decrease in the credit risk, since the lender now holds legal title to the financed property until the debt is repaid, making foreclosure easier and increasing the expected residual value of the credit in case of default.

The model estimated for credit risk (default rates) is:[29]

$$\Delta\log(1+default\_rate_t) = \beta_1\Delta\log(1+Selic_t) + \beta_2\Delta\log(unemployment_t) + \beta_3\Delta\log(income_t) + \alpha_1 Law10931_t + \varepsilon_t \quad (2)$$

Again, the coefficient of interest is α1. The idea is that most of the legal guarantees created by Law 10,931 would reduce the percentage of loans more than three months overdue. Note that we do not add the constant coefficient in the model for credit default risk, since it indicates a trend in the behavior of the dependent variable, which would be reasonable for the percentage change in housing credit (given population growth), but implausible for the percentage change in the default rate, which is already a percentage measure. Furthermore, the unemployment rate in the metropolitan region of Sao Paulo rather than the employment rate, like in the credit volume model, is used as a measure of the observed level of economic activity because of its better statistical performance in capturing the impacts of employment on the housing credit default rate.

[28] The variable "dummy_80%" reverts to zero as of March of 2008 due to Resolution 3,549. The inclusion of this variable aims to control for changes on the profitability of funds on account not lent under the earmarking rule. Between March 2004 and March 2008, these funds only earned 80 percent of the reference rate (TR).

[29] We also included in the model one lag of the dependent variable, which was statistically not significant.

Both models were estimated using all banks with housing loan portfolios and grouping these loans by ownership of the financial institution: loans by official or private banks.

4.3 Results

4.3.1 Housing Credit Balance

Table 3 shows the results of the first model (equation 1) for all financial institutions with housing loan portfolios (column 2), as well as the results when we consider official and private banks separately (columns 3 and 4). We tested for serial autocorrelation in the residuals (LM test). The result indicated the presence of serial autocorrelation of first order at only 10 percent significance (F statistic = 3.3529). However, the results were very similar when we corrected by Newey-West estimators.

Table 3 – Total Housing Loans Model

Dependent Variable:	d(log(Real Housing Loans))		
	Total	Private Lenders	Public Lenders
Independent Variables			
constant	0,00053	-0,00246	0,00226
	[0,833]	[0,525]	[0,278]
d(log(Requirements_real - FCVS_real))	0,02956***	0,57523***	
	[0,000]	[0,000]	
d(log(Requirements_real / FCVS_real))			0,02542*
			[0,095]
d(log(1+selic_rate_annual))	-0,48716**	-0,64438**	-0,43449**
	[0,010]	[0,036]	[0,040]
d(log(1+default_rate))	-0,57559***	-0,20529*	-0,04634
	[0,001]	[0,062]	[0,909]
d(log(employment_index))	0,46070**	0,40088	0,37948*
	[0,014]	[0,118]	[0,095]
d(log(income))	0,01728	0,03473	0,00767
	[0,200]	[0,127]	[0,632]
d(log(1+(Credit/GDP)))	1,40189***	0,04661	0,95391*
	[0,002]	[0,958]	[0,089]
Dummy_80	-0,00433	-0,00365	-0,00933**
	[0,195]	[0,438]	[0,004]
Dummy_Law_10931	0,00742*	0,00919	0,00981**
	[0,083]	[0,153]	[0,019]
R^2	0,48089	0,57387	0,27309
# of obs.	84	84	84

Note: *, ** and *** indicate coefficients statistically significant at 10%, 5% and 1%, respectively.

P-values in brackets.

Coefficient β1, which indicates the impact of requirements on total housing loans, is significant and positive, though small (approximately 0.03). This indicates that for an increase of 1 percent in the required housing lending, the effective loans made vary, on average, by 0.03 percent. This figure is much lower than we expected *a priori*. However, as we noted in Section 3, in the recent past official banks had leeway in complying with their earmarking requirements, which may cause underestimation of the impact of this variable.

Furthermore, the results indicate a negative relation of housing credit balance with the basic interest rate (Selic) and with arrears over three months. *A priori*, we expected that the implementation of Law 10,931 to decrease the mortgage default rate, as it increases the likelihood that the lender can repossess the financed property if it writes off the loan, and can recover at least part of the loan balance. In this case, the coefficient captures the impact of an institutional improvement on the housing credit supply, generated by the increase in the expected residual value of the credit contract. It was statistically significant at 8.4 percent and positive at approximately 0.0074. That is, the implementation of Law 10,931 increased the balance of housing loans, on average, by 0.74 percent in real terms.

The employment rate and real income, which reflect the level of economic activity, are positively correlated with the balance of housing loans. However, only the employment index is statistically significant, with a coefficient around 0.45. This coefficient may be capturing both the increase in demand for housing loans, generated by the rise in disposable income to honor mortgage debts, and the increase in credit supply as the level of employment reduces the credit risk of these operations.

The variables *credit/GDP* and *dummy_80%* were included in the model only as controls. Their respective coefficients, β6 and α2, indicate that there is a positive correlation between mortgage lending growth and credit expansion as a whole in the economy and that the reduction in the return on the non-invested resources did not significantly affect the balance of housing loans. It is worth recalling that this result may have been affected by substantially higher lending by official banks above the amount required by the earmarking rules.

Columns 3 and 4 in Table 2 present the estimation results of model 1, but separated by public and private lenders, respectively. The only difference is that for public institutions, the variable *Requirements_Real* is the first difference of the log ratio of real requirements over real FCVS balance. This is due by the fact that the absolute difference between these two variables is often negative. That is, the FCVS balance in some periods is higher than the total requirements imposed on public institutions.

The results suggest that the balance of housing loans from private institutions is largely guided by total requirements. The coefficient β1 is significant and positive, around 0.57. This indicates that for an increase of 1 percent in total requirements, housing loans rise on average by 0.57 percent.

In addition, the results indicate a negative relation of the balance of housing loans with the Selic rate and the proportion of loans over three months overdue. However, both variables that reflect the level of economic activity (*employment rate* and *income*) and those used only for control (*credit/GDP* and *dummy_80%)* show no statistically significant coefficients. Furthermore, the implementation of Law 10,931 also seems not to have significantly affected the balance of housing loans.

In general, the results lead us to infer that the volume of housing loans extended by private institutions is mainly driven by changes in the requirements imposed on them. Besides this, the increases in default rates and in the Selic rate reduce investments in housing credit.

The results also confirm that the amount of housing loans by public institutions is less dependent on requirement changes. Besides the positive impact of employment, increases in the Selic rate reduce housing finance investments. Moreover, the adoption of Law 10,931 increased the expansion of housing finance from public institutions, on average, by 0.9 percent.

The results of this subsection lead us to conclude that the balance of housing credit is driven by different factors and also to different degrees between official and private lenders. In general, the balance of housing loans from private institutions has a higher correlation with requirement changes imposed by earmarking rules, while the balance of housing loans from public institutions is more closely correlated with economic activity and institutional improvements that increased lenders' guarantees. As mentioned in Section 3, this result may be related to the type of borrower from public and private institutions. The next subsection presents the results of the credit risk model (equation 2).

4.3.2 Housing Credit Risks

Table 4 shows the results of the credit risk model for housing finance operations for all banks and separating them into private and official ones, as in Table 2. The dependent variable is the percentage variation in the number of housing loans more than three months behind. Recall that this credit default measure does not consider the financial value of these contracts. Thus, it does not reflect the potential loss of banks' mortgage portfolios. Furthermore, we considered only contracts signed after June 1998, as only those are subject to the rules on trust deed mortgages.

We also tested for serial autocorrelation in the residuals (LM test). The result indicated the presence of serial autocorrelation of first order at 5 percent significance, except for private banks. However, the results were very similar when corrected by Newey-West estimators.

Table 4 – Credit Risk Model

Dependent Variable:	d(Proportion of contracts with more than 3 months of delay)		
	Total	Private Lenders	Public Lenders
Independent Variables			
d(log(1+Selic_Rate_Annual))	0,07107	0,00019	0,06603
	[0,300]	[0,998]	[0,651]
d(log(unemployment))	0,04892	0,13847	0,46740**
	[0,577]	[0,152]	[0,014]
d(log(income))	-0,00454	-0,00199	-0,01009
	[0,360]	[0,714]	[0,341]
Dummy_Law_10931	-0,00171***	-0,00008	-0,00256**
	[0,001]	[0,885]	[0,015]
R^2	0,05725	0,03138	0,13069
# of obs	87	87	87

Note: *, ** and *** indicate coefficients statistically significant at 10%, 5% and 1%, respectively.
P-values in brackets.

The results show that the enactment of Law 10,931 reduced the default rate by approximately 0.17 percent, and it is only statistically significant for loans by public lenders (reduction of approximately 0.25 percent). Furthermore, the level of employment only significantly affects the default rates on loans by public banks.

Once again, the results probably indicate the profile difference between customers of public and private banks. Since public banks, in general, specialize in providing housing loans to lower income classes, the default rate faced by them is more correlated with the level of income and employment. In addition, by having a more risky portfolio of housing loans (see descriptive Figures 13, 14, 15, 18 and 19), the adoption of the trust deed mortgage rules, which gained legal force in Law 10,931, brought major benefits in terms of the risk of public banks' housing loan portfolios of public banks.

5. Conclusion

This study investigated the causes and consequences of the recent housing finance expansion in the Brazilian economy, aiming to evaluate whether this development was the result of recent institutional and economic improvements or merely a result of the increase in requirements imposed on financial institutions by earmarking rules.

Results suggest different answers, whether the financial institutions are public or private. For private institutions, the recent expansion in the number of housing loans has been driven largely by higher reserve requirement levels that came from the growth of savings account deposits, which became attractive due to the increasing relative yield as the real Selic (benchmark) rate declined. This was only feasible due to the consolidation of macroeconomic stability. Even without finding the same impact on public institutions, in this case the gap that existed between housing lending requirements and credit balance has fallen significantly in recent years, which leads us to believe that this restriction will be more active in the near future also for public institutions. Furthermore, the lower risk generated by Law 10,931, which facilitates foreclosure on delinquent mortgages, increased lending only from public institutions.

Additionally, our findings indicate that the enactment of Law 10,931, the economic stabilization and employment gains have brought benefits in terms of default rates, but also only for lending by public institutions. It is plausible that this is the result of the income profile difference between borrowers from public and private banks. As public banks specialized in housing loans for people of lower income, default rates faced by them are more correlated with income and employment levels. Finally, it is noteworthy that the adoption of the trust deed mortgage arrangement, which gained legal force from Law 10,931, brings greater benefits for banks with riskier housing finance portfolios.

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