Serie Documentos de Trabajo

The Demand for Mortgages under Macro Volatility: The Argentine Case

Sebastián Auguste, Ricardo Bebczuk y Ramiro Moya

The Demand for Mortgages under Macro Volatility:

The Argentine Case

Sebastián Auguste
Ricardo Bebczuk
Ramiro Moya

The Demand for Mortgages under Macro Volatility:

The Argentine Case

Sebastián Auguste
Ricardo Bebczuk
Ramiro Moya

IDB

Inter-American Development Bank

2011

http://www.iadb.org

Abstract[1]

This paper analyzes mortgage loan demand in Argentina using a new survey administered in the Buenos Aires Metropolitan Area. It is found that recurring macro volatility and violation of financial property rights have increased demand for real estate as an investment, which in turn raises house prices and makes it more difficult for consumer households to meet minimum income requirements for obtaining a mortgage. Affordability thus seems to offer a better explanation than standard supply side constraints for the small size of the mortgage market in Argentina. Overall, the findings suggest that the shallow mortgage market has not posed a major impediment to home ownership rate in Argentina and that the small (and shrinking) mortgage market has more to do with lack of demand than credit supply constraints.

JEL classifications: G21, R21, R31
Keywords: Housing, Mortgage market, Macro volatility, Argentina

1. Introduction

The mortgage market in Argentina quickly expanded during the 1990s as a result of the economic boom, market-oriented reforms in the financial sector, and an upgrading to international best practices in the mortgage regulatory framework. The stock of mortgage loans increased from 0.9 to 6 percent of GDP between 1990 and 2000. Mortgage loans became an important product for banks (36 percent of their loan portfolio) and for new homeowners (30 percent of new titles were mortgage-financed). Whereas the stock of total credit to the private sector increased by two-and-a-half times over the 1990s, the stock of mortgage loans increased fivefold.[2]

Macroeconomic conditions changed dramatically by the end of 2001, however, when Argentina was hit by a massive financial crisis (after three years of stagnation). In December of 2001 a sovereign default was announced, and in January 2002 the currency board was abandoned. The local currency drastically devaluated from one peso per US dollar to almost four per dollar in a few months. The devaluation produced widespread balance sheet effects in a highly dollarized economy, and several emergency measures were taken. Deposits in foreign currency were "pesified" at 1.4 pesos per dollar (well below the market rate, implying large losses for depositors) and banking loans in foreign currency were pesified at one peso per dollar (implying large gains for debt holders).[3] In this period, mortgage loans were pesified as well, and foreclosures were temporarily suspended. Real GDP and private consumption plummeted 10.9 percent and 14.4 percent, respectively, in 2002 alone, down 18.4 percent and 21.4 percent, respectively, from their pre-crisis peak in 1998. Argentina's crisis was reflected in the value of local assets in US dollars. The Merval index (which reflects the value of major companies listed on the Buenos Aires Stock Exchange) fell drastically, and real estate prices in US dollars plunged by 50 percent on average in Buenos Aires City.

The exit of the crisis was V-shaped, favored by the international context and the boom in commodity prices. Between 2009 and 2002 the economy grew at an impressive annual rate of 7.5 percent, whereas construction grew 16 percent annually. Housing prices in US dollars bounced back and even surpassed the 1990s levels, at the time that real incomes and employment

---

[2] The paper mainly deals with mortgage housing finance through the banking system. However, at some points in the document, reference will be made to other forms of public or private housing finance.
[3] For a description of the Argentine crisis see Auguste et al. (2006). Agarwal, Chomsisengphet and Hassler (2005) describe the housing finance policies implemented during the crisis.

recovered as well. But, in spite of the general economic improvement after the crisis, the mortgage market never went back to its pre-crisis depth. In 2009 the stock of mortgage loans represented just 1.6 percent of GDP, or 15 percent of total private sector credit, compared to 6.2 percent and 35 percent, respectively, in 2001. In that year, only 6 percent of new titles were financed by mortgage loans, compared to 25.5 percent in 2001. Evidently, the housing market recovered with less leverage.

The focus of our paper is on the demand side of the mortgage market. We believe supply side restrictions (the reluctance by banks to lend long-term) cannot fully explain the post-crisis contraction in mortgage loans, since overall credit conditions have been better in the 2000s than in the 1990s. Banks have been very liquid, in a context of very low real interest rates (actually almost zero, compared to 15 percent in the previous decade). Also inconsistent with supply side restrictions is the fact that in the 2000s banks offered mortgages at longer durations and higher loan-to-value ratios than in the 1990s. In addition, government interventions pushing the supply (through interventions in the secondary market and increasing direct lending through public banks) have not had noticeable effects on the equilibrium number of mortgage loans either. The lack of a dynamic mortgage market is hard to reconcile with a booming housing market in terms of prices, transactions and newly built units unless mortgage demand restrictions are at work.

The Argentine case is of particular interest in determining the role of demand in mortgage market underdevelopment and the role of real estate as a safe asset, beyond the usual housing services. As a result of the expropriation affecting most financial assets, investors have gradually increased the housing share in their portfolios in the aftermath of the crisis, thus pushing up housing activity (transactions, prices, and construction). But higher prices vis-à-vis household income generates affordability problems for families trying to buy their home, thus reducing the demand for mortgages. Equally important, understanding the role of housing as a vehicle for long-term saving is key to solving the seeming paradox of high home-ownership rates coexisting with a tiny mortgage market.

The Argentine case remains largely underexplored. Kiguel and Podjarny (2007) provide descriptive statistics of the recent evolution of the mortgage market for Argentina, Chile and Uruguay to investigate the factors explaining the relative success of Chile. They claim that, although there are differences in the legal framework and financial instruments used in primary and secondary markets, they do not seem to be the main explanation for the unequal levels of

development among the three countries. On the contrary, the most important variables in explaining the differences are macroeconomic conditions. These include the following:

1. A stable currency to finance long-term fixed-rate loans or, in the presence of double-digit inflation, indexation, loans in hard currencies, or other adjustment mechanisms that allow for long-term contracts.

2. For the first condition to work well in practice, the economy must maintain a certain level of macroeconomic stability, especially regarding the exchange rate, price levels and interest rates.

3. The existence of mechanisms for flexible and standardized mortgage origination (primary market) and institutional investors to provide a long-term horizon financing to feed the secondary market.

4. Potential mortgage holders, especially employees, must be able to meet the credit requirements to qualify for a loan, a situation sometimes difficult to achieve in an environment where the ratio of housing prices to wages is high and nominal interest rates are high as well.

Their conclusions are based on descriptive macro statistics and a simulation exercise on the behavior of payment-to-income ratio that a hypothetical mortgage holder should have to pay under a standard fixed rate loan in each country according to its macro volatility history.[4]

Cristini and Moya (2004) analyze the deepening of the mortgage market in the 1990s compared to the failure of the 1980s, concluding that the rapid takeoff is due to both macroeconomic stability and the development of legal and market institutions. Banzas and Fernández (2007) describe the Argentine case including the 2001/2002 crisis. Using household survey (EPH) data for 2007, they perform a simple affordability exercise and find that, in spite of the more favorable conditions offered by banks, almost 60 percent of the population does not satisfy the minimum requirements for obtaining a mortgage loan.[5]

---

[4] In a 10-year loan indexed to CPI with an initial loan payment-to-income ratio of 30 percent, the probability that the ratio goes above 40 percent for 12 consecutive months is 53 percent in Argentina and just 3 percent in Chile, which means that in a standard mortgage contract, an Argentine household faces greater risk of experiencing difficulties in repayment.

[5] In the exercise they use prices for the cheapest neighborhoods of Buenos Aires City, and they generously correct family income upwards to compensate for underreporting. Their results should thus be interpreted as a lower bound, i.e., the percentage of excluded families may exceed 60 percent.

Cristini and Moya (2008) analyze housing across Latin America and find, *inter alia*, that the region has high ownership at the expense of quality. Cristini and Iaryczower (1997), evaluating the public housing finance system FONAVI based on a simulation exercise using household survey (EPH) microdata, find that the implicit subsidy (from 20 to 80 percent, depending on the province) is too high and unequally distributed. Although the decentralization of the 1990s helped to improve efficiency, there are still middle-income households receiving the subsidy. Gaba et al. (2003) explore the possibility of introducing an indexation system similar to Chile's, and Delgobbo (2000) evaluates the competitive effects of the creation of a secondary institution by one of the most important mortgage banks in Argentina.[6]

These papers are based either on macro data or household survey data, as micro data on housing finance are nearly nonexistent. An exception is Agarwal, Chomsisengphet and Hassler (2005), who also study the 2001/2002 crisis in Argentina. These authors use a unique loan-level data set to empirically assess the impact of the currency devaluation and the economic response policies on prepayment and default patterns of residential mortgages as a consequence of the previously mentioned pesification of bank loans and deposits.

For the present research work, we exploit for the first time a preexisting living conditions survey including some limited data on housing finance and, especially, a unique survey conducted for this study. This information is particularly suitable for exploring the state of the housing finance system (with primary but not exclusive emphasis on the mortgage market) and the demand drivers behind it.

The remainder of the paper is structured as follows. Section 2 briefly describes the housing and housing finance system in Argentina. Section 3 provides a discussion on the recent evolution of the Argentine mortgage market. Section 4 describes the novel micro-data used and reports the main findings, and Section 5 offers concluding remarks.

---

[6] Warnock and Warnock (2008) provide cross-country evidence of the variables affecting mortgage depth, where Argentina is included, finding that countries with stronger legal rights (through collateral and bankruptcy laws), deeper credit information systems, and a more stable macroeconomic environment have deeper housing finance systems. Across developed countries, which tend to have low macroeconomic volatility and relatively extensive credit information systems, variation in the strength of legal rights helps explain the extent of housing finance.

2. Housing and Housing Finance in Argentina

2.1 Housing

As mentioned earlier, the ownership rate is rather high in Argentina, with a level of around 70 percent. In fact, housing quality problems are more pervasive than ownership. According to the last Census available, the quantitative deficit of housing by 2001 was equivalent to 8.6 percent of households, but the qualitative deficit (measured by households living in recoverable—i.e., low-quality—dwellings or in overcrowded rooms) was 20.2 percent. More recent data can be obtained from the National Household Survey, which is conducted in Argentina's major urban areas (2010 Census results were not available at the time of writing). As shown in Tables 1 through 4, while home ownership has decreased in the late 2000s (especially for middle to high-income households and young household heads), an increase has taken place in house size (measured by number of rooms) except for the richest quintile, along with a reduction in the number of persons per room and an overall improvement in the quality of dwellings. The same trend of home ownership is observed in Uruguay but not in Brazil and Chile.[7]

Table 1. Argentina: Tenure and Type of Dwellings

	1991	2001
Owners	61.5%	70.6%
Renters	12.3%	11.1%
Others	26.2%	18.2%
Type of dwellings		
Houses	79.4%	82.4%
Good quality	65.4%	69.0%
Reasonable quality	14.0%	13.4%
Shanties	3.3%	3.2%
Apartments	16.1%	14.3%
Others	1.2%	0.1%

Source: Authors' estimates based on Censuses of Population.

---

[7] Methodological changes in household surveys limit the time series analysis of housing. In the case of Argentina, the EPH was replaced in 2003 by the Continuous EPH.

Table 2. Argentina: Quantitative and Qualitative Deficits, 1980-2001

Indicator	1980	1991	2001
(1) Households (000's)	7,572.3	8,927.3	10,075.8
(2) Occupied units (000's)	6,798.3	7,743.5	9,204.7
Good quality dwellings	6,198.7	6,281.9	7,628.2
Recoverable dwellings (low quality)	599.6	1,461.6	1,576.5
Quantitative Deficit			
Quantity of houses (000's (2)-(1))	774.1	1,183.8	871.1
As % of households	10.2	13.3	8.6
Qualitative Deficit 1/			
Quantity of houses (000's)	2,288.3	2,497.9	2,036.3
As % of households	30.2	28.0	20.2

Source: Authors' estimates based on Censuses of Population.
1/ Recoverable dwellings plus units with overcrowded rooms.

Table 3. Argentine Main Urban Areas: Tenure and Type of Dwellings

		Income Quintile						Age Range				
		1	2	3	4	5	Total	16-24	25-40	41-64	65+	Total
Home-ownership	1999	57.9	65.5	69.8	72.3	79.2	70.2	28.1	55.4	78.5	84.7	71.3
	2009	56.2	63.1	68.3	70.2	69.0	66.2	23.2	44.4	74.3	84.5	66.2
Number of rooms per house	1999	2.5	2.7	2.7	2.9	3.3	2.9	2.2	2.6	3.2	2.9	2.9
	2009	2.6	2.8	2.9	3.1	3.2	3.0	2.0	2.6	3.2	3.1	3.0
Persons per room	1999	2.2	1.7	1.3	1.1	0.9	1.4	1.4	1.7	1.4	0.8	1.4
	2009	2.0	1.5	1.3	1.1	0.8	1.3	1.5	1.6	1.3	0.8	1.3
Share of "poor" dwellings	1999	7.5	3.9	2.8	2.1	0.6	3.0	6.7	4.5	2.1	1.4	2.8
	2009	6.4	3.1	1.7	1.4	0.5	2.3	7.1	3.5	1.8	1.0	2.3
Share of dwellings of low-quality materials	1999	4.3	2.4	1.6	1.0	0.4	1.7	1.5	1.9	1.4	1.7	1.6
	2009	4.6	1.9	0.9	0.6	0.4	1.4	3.5	1.7	1.3	1.1	1.4

Note: 1999 figures are based on the Permanent Household Survey (EPH) and 2009 on Continuous Permanent Household Survey (EPHC) (in 2003 EPH was replaced by EPHC, but the same urban areas are included in the sample)
Source: CEDLAS/SEDLAC.

Table 4. Urban Areas: Home Ownership Rate by Income Quintile

		Income Quintile					
		1	2	3	4	5	Total
Argentina	1999	57.9	65.5	69.8	72.3	79.2	70.2
	2009	56.2	63.1	68.3	70.2	69.0	66.2
Brazil	1999	63.6	66.4	69.6	71.4	74.9	70.1
	2008	65.7	66.5	69.9	72.9	76.2	71.0
Chile	1998	54.8	62.7	69.5	70.4	70.5	66.6
	2006	57.0	66.1	69.6	70.9	69.1	67.0
Uruguay	1998	43.9	60.1	69.6	76.6	82.6	69.3
	2006	30.7	50.7	62.3	68.7	75.9	60.7

Source: CEDLAS/SEDLAC.

2.2 Housing Finance

In Argentina there are two main sources of housing finance: bank mortgages and public housing programs. Other types of financing or mortgages from non-banking institutions are not common.

A massive state housing program has been in place for several decades in Argentina, based on a supply-side, turnkey production system targeting the poor. It is not based on a mortgage-type contract, although households have to pay a (generally fixed) monthly payment for a period of time after the house is allocated. The payment implies a generous subsidy that deters any fair private sector competition.

FONAVI (*Fondo Nacional de la Vivienda*, National Housing Fund) and *Programas Federales* are the most important housing programs. Together they supply almost one quarter of the flow of new units in the country each year.

FONAVI has historically displayed severe flaws, among them the following: i) it overwhelmingly produces new units for sale to moderate and middle-income households, rather than a wider range of low-cost housing solutions suited to low-income families; ii) membership neither requires households to make a down payment nor obtain a private market-rate loan, so that households are fully financed by the program under heavily subsidized conditions; and iii) the institutional design for decentralization generates low incentives to the efficient use of funds. (See for instance, Gautier et al., 2006, and Moya, Bermúdez and Sparacino, 2010).

From a long-term perspective, public programs have built more than 1 million houses since 1976, which represents around 30 percent of new housing stock in the same period. Since

2003 the rate of public housing construction has increased and new programs have proliferated. In line with these developments, federal expenditure on housing has almost doubled, increasing from 0.45 percent of GDP in 1990s to 0.7 percent in the 2000s. Many of these recent federal initiatives continue to display some of the crucial weaknesses of the old system. In particular, they have failed, as in other Latin American programs, to replace turnkey production with direct demand-subsidy programs that use private developers and lenders to build new units for moderate-income households much more effectively.

Figure 1 displays the flow of government housing resources and that of housing mortgages supplied by the banking system, both in percentage of GDP, which indicates the growing role of public housing programs relative to commercial mortgage financing.

Figure 1. Flow of Housing State Programs and Bank Housing Mortgages, 1994-2008
(% of GDP)
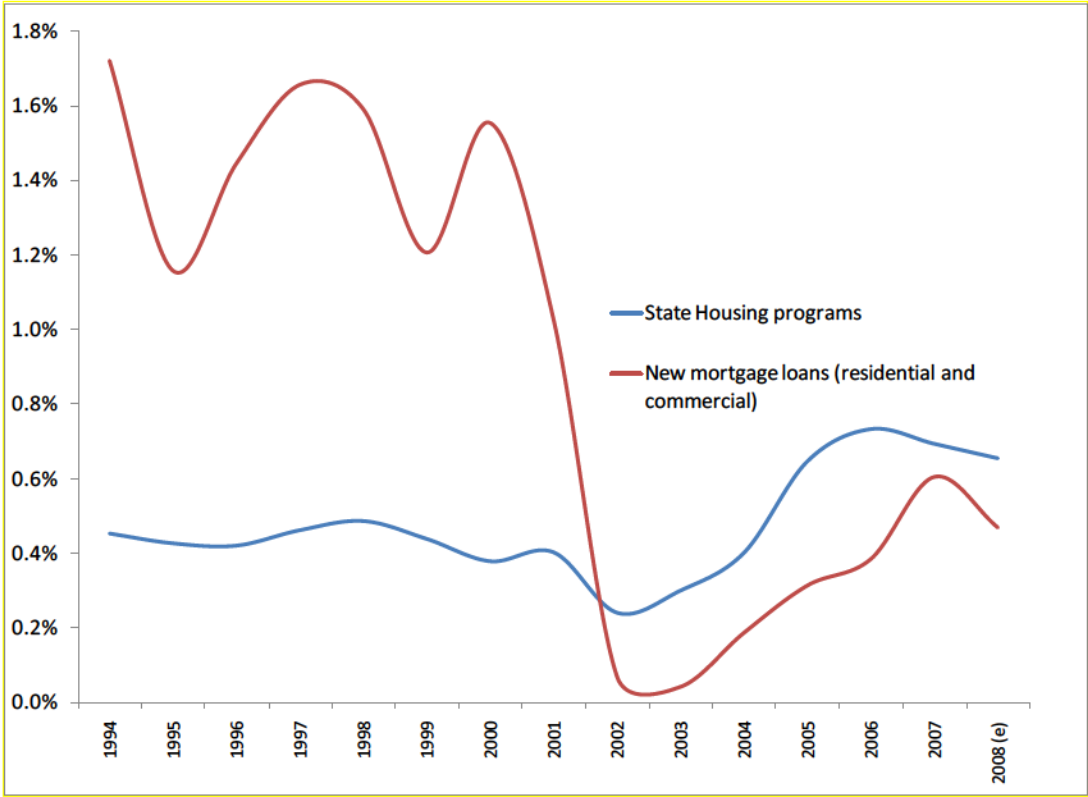
While government housing programs have not promoted the development of the mortgage market, they do not seem to have hurt it significantly, since massive public housing programs are intended for a population segment of little interest to the mortgage market.[8] As for direct interventions in the latter market, they have been very small in scale, and thus they did not have any perceptible effect on market size or structure.

2.3 Mortgage Market

All indicators confirm that this market, despite an incipient but still trifling takeoff in the 1990s, remains largely undeveloped even after the post-crisis economic recovery.

Historically the mortgage market was very small in Argentina. In the 1970s and 1980s it was dominated by public banks. A moderate and short-lived boom in mortgage loans took place in the mid-1990s in response to proper macroeconomic and institutional conditions. Total mortgage loans jumped from 1.8 percent of GDP in 1993 to a maximum of 6.2 percent of GDP in 2001. Mortgage loans for housing increased from 2 percent to 4 percent of GDP in the same period.

As a consequence of the 2001-2002 crisis, private credit dropped from 20.1 percent of GDP in 2001 to 11.4 percent in 2009, whereas mortgage loans fell from 6.2 percent to 1.6 percent of GDP (from 4 percent to 1 percent in the case of housing loans). Likewise, the stock of mortgage loans represented 31 percent of the total stock of credit to the private sector in 2001 and only 14.5 percent in 2009 (see Figure 1). This clearly indicates that mortgages were hit even harder than private credit as a whole.

---

[8] Nevertheless, recent estimates from a survey on this topic indicate that some filtering might be happening. In fact, although 41 percent of beneficiaries belong to households in the lowest two income deciles, 11 percent display incomes comparable to the highest 20 percent of the distribution. This filtering seems to be more important among FONAVI´s beneficiaries than the more recent programs (the so called *Programas Federales*). See Moya, Bermúdez and Sparacino (2010).

Figure 2. Private Credit and Mortgage Credit in Argentina, 1969-2009
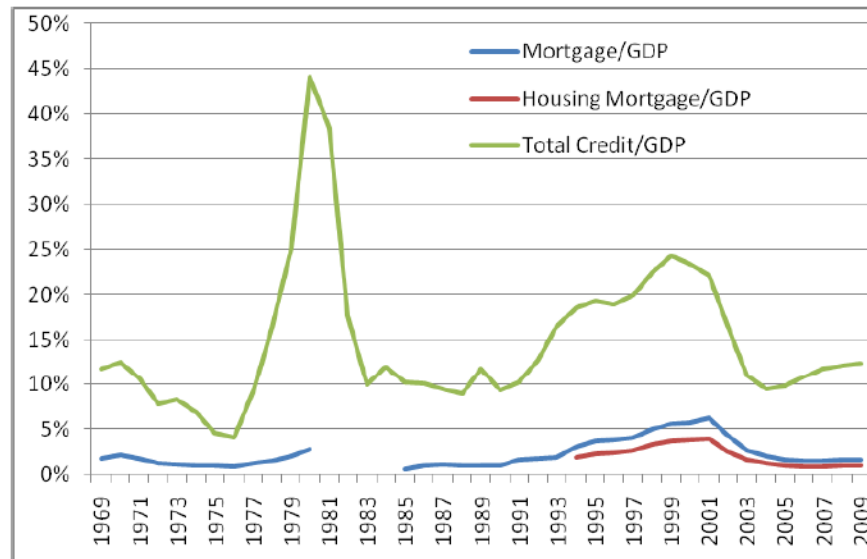
The structure of loans, presented in Table 2 of the Statistical Appendix, reveals that bank credit in Argentina is mostly biased toward short-term lines such as overdrafts, bills, personal, and credit card loans, which account for 66.4 percent of total loans before the crisis (1994-2000) and 73.1 percent after the crisis (2003-2009). Mortgage loans represented 24.9 percent before the crisis, peaked at 36.4 percent (presumably because of their longer maturity at a time when other loans were not being made) and dropped to 21 percent of the total in the period 2003-2009. Considered on a year-by-year basis, though, this share has dropped from 35.5 percent in 2003 to a mere 15.4 percent in 2009. According to Table 3, both before and after the crisis, only about 30 percent of mortgage loans have maturities above 10 years, while the rest are under 5 years (50 percent) and between 5 and 10 years (20 percent). The nominal interest rate on mortgage loans (see Table 4) has averaged around 14 percent throughout the period. While high by international standards, it must be recalled that it was especially so in the 1990s when a fixed exchange rate and low inflation were the norm. In contrast, the inflationary regime prevalent since 2005 has rendered nominal interest rates in the 15 to 20 percent range slightly positive or just negative in real terms.[9]

The small size and lack of aggregate impact of the housing mortgage market can be visualized through other indicators as well. Using publicly unavailable information from *Central*

---

[9] For instance, as of July 2010, the nominal interest rate is about 18 percent which, after adding 4 percentage points for administrative costs, amounts to 22 percent, against a projected annual inflation rate of 25 to 30 percent.

de Deudores (the credit register administered by the Central Bank) over 2002-2009, Table 5 in the Statistical Appendix indicates the following:

- Housing mortgage loans have steadily increased over time as a share of total mortgages but still account for only between 28 and 50 percent of total mortgages (both in terms of volumes and number of borrowers), the rest being mortgages granted to enterprises;

- The banking system has only 158,000 housing mortgage clients in 2009 (down from 182,000 in 2002). For a country where more than three million households do not own a house, this figure looks quite insignificant.

- The average loan size is remarkably low compared to home values. While loans have moved from US$6,000 in 2002 to US$14,000 in 2007-2009, the average value of urban houses, with obvious differences by location, has been between US$30,000 and US$60,000. This would mean that actual loan-to-value ratios are quite low and/or some loans are used for home remodeling and improvements (or to cover other expenses not related to housing) rather than to buy a new home.

As an additional proof of the low penetration of housing mortgages, Table 6 displays the number of new property titles in Buenos Aires City, the country's richest district in per capita GDP terms. The percentage of mortgage-related titles reached its peak in 1994 (34.7 percent). In general, the figure for 1991-2000 (29.5 percent), while already low, is more than four times higher than the 2003-2009 level of 6.7 percent.

The configuration of the mortgage market by bank in 2002 and 2009 appears in Tables 7A and 7B. In both cases, substantial concentration in only a few institutions is observed. The top five banks account for 76.2 percent of total volume in 2002 and 86.6 percent in 2009, while for the top 10 the cumulative share exceeds 95 percent. No change is found when looking at the number of borrowers instead of loan volume. The two largest public banks (Banco Nación and Banco de la Provincia de Buenos Aires), the private and foreign-owned Santander Río and BBVA Francés, and Banco Hipotecario (with both private and public sector ownership) have

appeared in the top five on both dates. The last column of both tables shows that the average loan size has shrunk from US$27,350 to US$12,400 between 2002 and 2009.[10]

3. Key Stylized Facts about Mortgage Financing in Argentina

In order to make sense of the current state of housing finance in Argentina, with an emphasis on mortgage finance, a number of stylized facts from the 1990s and the 2000s must be highlighted. Furthermore, these observations provide evidence to support or reject the demand-driven hypothesis advanced in this paper.

3.1 Mortgage Regulation and Other Government Interventions

Since the mid-1990s, mortgage regulation in Argentina has been friendly or at least innocuous, leaving the private sector broad flexibility in designing its products. In the 1990s overall and mortgage-specific banking regulations were upgraded in Argentina to adapt to the best international practices, a credit bureau (*Central de Deudores*) was created, the legal framework was amended to facilitate the issuance of mortgage-backed assets and some public banks were privatized. These changes, within a stable macroeconomic environment and the dollar as a unit of value for long-term saving and lending (legally set as a currency board), were instrumental to a modest mortgage market boom. As regulations did not substantially change between the 1990s and 2000s—if anything, they were in some aspects improved in some aspects—no regulatory overkill can explain the collapse of the mortgage market in the last decade.[11,12] For the sake of exposition, the regulatory framework will be divided into several areas, which immediately follow.

---

[10] It can be seen that, as of 2009, Banco Nación and Banco de la Provincia de Buenos Aires offer larger loans (US$18,800 and US$15,700, respectively) than other institutions. In terms of policy implications, this may involve selection of high-income clients (contrary to the educated prior regarding the role of public banks in targeting lower income groups) and/or to higher loan-to-value ratios.

[11] At any rate, the prohibition of inflation-indexed contracts appears as the only major regulatory constraint on the mortgage market. Given the fact that the lack of indexation entails a macro-level policy rather than a mortgage-specific one, it remains to be seen whether an indexation regime would remove the current reluctance of banks and potential clients to enter the mortgage market on a massive scale, which would require all key relative prices to be credibly anchored in the long-run.

[12] At present, banks offer fixed, variable and mixed interest rates and have launched some innovative products in terms of long-term adjustment (for example, Banco Nación has a line where the interest rate adjusts to wage increases, and payments have a cap in terms of client income). However, this varied menu has not increased the demand for mortgages, nor has the zero to negative real interest rate. This is consistent with the fact that the interest rate, especially the short-term one, is the only risk factor in a mortgage contract. Real income and unemployment risk may likely play a larger effect on the decision to apply for such a loan.

13

3.1.1 Securitization and Other Capital Market-Related Reforms

Law 24.441 (Law of Housing Finance and Construction), passed in 1994, established new instruments to facilitate housing finance through capital markets. Following international best practices, the norm set up the legal framework for the securitization of mortgage bank loans via the issuance of financial trusts (*fideicomisos financieros*). Likewise, it authorized the issuance of *Letras Hipotecarias* (mortgage-backed securities). These reforms were followed in 2000 with the creation of *Banco de Crédito y Securitización* (BACS), a second-tier institution to promote these transactions, owned by Banco Hipotecario (70 percent), International Financial Corporation (20 percent), IRSA (an Argentine listed company, with a 5.1 percent share), and Quantum Industrial Partners (a foreign investment fund, owning the remaining 4.9 percent). Once the economy stabilized after the 2001-2002 crisis, BACS initiated its operations with the issuance of *Cédulas Hipotecarias* (mortgage-backed securities). These favorable changes for the securitization process were accompanied by better macroeconomic conditions than in the past and by the inception of the private pension system in 1994, which was thought to fuel a large demand for such long-term securities. To further foster securitization, in July 1997 the Central Bank issued, through *Comunicación* "A" 2563, an Origination Manual for Mortgage Loans aimed at standardizing loans so as to increase the critical mass of those eligible for securitization.

The outcome, however, has not lived up to expectations. Financial trusts have never taken off, with a stock of 0.5 percent of GDP and just 4.5 percent of total bank loans securitized on average for 2000-2009 (see Table 8A). These values are even lower in recent years: in 2009, for example, they were 0.3 percent and 2.8 percent, respectively. Mortgages account for an equally decreasing share of these trusts, from a maximum of 78.4 percent in 2002 to 19.2 percent in 2009. Housing mortgages, in turn, represent about 50 percent of total mortgage-based financial trusts. Table 8B shows the small volume of securitized total mortgages (10.7 percent in 2000-2009) and housing mortgages (17.6 percent). *Cédulas Hipotecarias* represented 11 percent of total mortgage-based trusts over 2000-2008, but jumped to 77.8 percent in 2009 thanks to the use of retirement funds now administered by the government and previously managed by the private pension funds, which were nationalized in 2008.[13]

---

[13] Another failed initiative from the Central Bank has been the promotion of a swaps market, which would allow banks to transfer to other investors their long-term, fixed interest rate loans—such as most mortgages, at least in their first years—to match their floating interest rate obligations. In spite of the Central Bank auctions, the interbank swaps market has not traded more than US$1.2 billion per year since 2006. Delfiner (2010) lists a number of reasons

3.1.2 Foreclosure Procedures

Law 24.441 additionally created a special out-of-court foreclosure settlement which, unlike the regular judicial course of action, includes a precise and short (60 days) timeline from the moment the mortgage becomes non-performing to the point at which the property is transferred to the creditor on an expedited basis. In practice, according to market sources, this reform was of limited help in accelerating repossession procedures, which still last approximately two to four years.

However, a noticeable step backward for creditor rights was the suspension of foreclosure proceedings in the aftermath of the 2002 crisis. By Law 25.563, passed in February 2002, the Congress suspended all mortgage foreclosures for 180 days. This legal step was intended to cope with the financial distress of those borrowers with dollar-denominated liabilities and peso-denominated incomes, whose ability to repay was seriously impaired by the steep peso devaluation after the abandonment of the Convertibility Plan. After several extensions of this norm, Law 26.167 of 2006 prohibited any foreclosure on houses for unpaid loans under AR$100,000 at origination, applying it to mortgages finalized between January 1, 2001 and September 11, 2003. In 2003 a new mechanism (*Sistema de Refinanciación Hipotecaria*, Law 25.798, passed in November 2003) was put in place to alleviate the situation of delinquent mortgage borrowers with debts under AR$100,000 at origination, whereby past-due loans were transferred to a trust administered by *Banco Nación*. In this case the beneficiaries were not only bank borrowers but also those indebted with non-bank, informal intermediaries (which are estimated to constitute 40 percent of all failed mortgage borrowers). The trust was commissioned to recover unpaid loans under benign conditions for borrowers, while canceling past-due services with government bonds.[14]

At the same time, loans were pesified at the pre-crisis exchange rate of 1 peso per US dollar, while bank liabilities were allowed to keep track of the official exchange rate, initially set at $1.4 peso per dollar. Later in 2002 debts were adjusted by a wage-linked index (*Coeficiente de Variación Salarial*). Law 26.167 of 2006 finally determined that the amount of debt should be the lowest between the above indexed value and the original outstanding debt converted at the $1

---

for this disappointing situation, including: i) institutional and economic instability; ii) lack of interested investors, as most banks are on the same side of the market, and of specialized market makers, with the sole exception of the Central Bank; and iii) the short-term bias of banks' assets and liabilities, which undermine the demand for long-term derivatives such as swaps and hinders the development of a term structure of interest rates.

per US dollar exchange rate plus 30 percent of the wedge between the market exchange rate and the $1 peso per dollar parity, plus 2.5 percent annual interest.

In terms of policy implications, these actions provided relief for many households, but it represented a violation of creditor rights, which has undermined the willingness of depositors to invest in the banking system and the willingness of banks to make mortgage loans.[15]

3.1.3 Mortgage Affordability-Related Regulatory Measures

In August 2006, the Central Bank issued *Comunicación* "A" 4551 allowing banks to lend up to 100 percent of the value of the property whenever this value does not exceed AR$200,000, and up to 90 percent when the value ranges from AR$200,001 to AR$300,000. Previously, the regulatory upper limit for all mortgages was 70 percent. This norm was designed to ease access to credit by households unable to save enough for the down payment. As we found in interviews with bankers, however, this reform was inconsequential, as the maximum loan-to-value ratio found in the market has remained around 70 percent. This stems from the fact that the actual binding constraint is insufficient affordability to Argentine households, as shown earlier in the document.

3.1.4 Mortgage Affordability-Related Direct State Interventions

In recent years, the government has sought to promote the development of the mortgage market through more direct interventions seeking to confront the affordability problem. Two initiatives are worth mentioning. In August 2006, the *"Plan Inquilinos"* ("Renters Plan"). The goal was to confront the affordability constraint by enabling renters to buy a house with similar characteristics to the one they were living in while paying a monthly amount no higher than their monthly rent. However, the only pecuniary support from the government was the reimbursement of the 21 percent value added tax on the materials bought to build a new house. The plan failed as a result of the wedge between monthly payment and rent, which is at the heart of the affordability issue.[16]

---

[15] Nevertheless, it must be noted that banks, even before the crisis, were reluctant to go forward with foreclosure procedures, and were and still are more inclined to exhaust out-of-court debt renegotiation.

[16] According to *Reporte Inmobiliario*, a business magazine specialized in real estate, only 3,049 mortgages were granted under this scheme. The same publication asserts "It could have had some impact if people were flexible enough to move to less expensive locations. But this is not the usual choice, and thus many prefer remaining as tenants."

In May 2009 the government launched a housing finance plan backed by retirement funds maintained by *Administración Nacional de la Seguridad Social* (ANSES), with Banco Hipotecario acting as the direct, first-tier lender. Despite this allegedly softer funding source, the fixed interest rate was set at 10 percent for new construction, 13.95 percent for purchase of new homes and 15.95 percent for existing houses. When administrative expenses were included these figures went up to 14 percent, 18 percent and 20 percent, respectively. The program did not have any noticeable impact on the mortgage market as a whole.

3.1.5 Pro-Informal Borrowers' Regulatory Measures

Comunicación "A" 4551 of 2006 also allowed banks to use credit scoring to accept or reject mortgage loan applications under AR$200,000 instead of requiring formal income documentation. This was thought to ease the access to credit to informal workers. In practice, this caused no major change in the pool of borrowers. Banks, according to interviews, were already lending to partially informal workers. In such cases, the bank would set a higher payment-to-income ratio (for example, up to 50 percent of formal income) to account for the undocumented income (estimated via documented wealth or bank movements). However, fully informal workers did not gain access to this market after the measure was put in place.

**3.2. Portfolio Choices, Affordability and Ownership**

In the 2001/2002 crisis deposits were frozen and partially confiscated, but this was not the only episode of deposit confiscation in Argentina; in 1990 large deposits were compulsorily exchanged for government bonds. Since Argentine economic history displays recurring banking and currency crises, it is not surprising that a distinctive feature of the Argentine financial environment is savers' have grown to deeply distrust formal financial intermediaries.

An eloquent testimony to this phenomenon is the evolution of domestic credit to the private sector, as shown in Figure 3. In 1960, it represented 14 percent of GDP in Argentina and 17 percent, on average, in the rest of South America. At present, however, those values are about 12 percent and 40 percent, respectively. Even during the flourishing 1990s, private credit to GDP did not exceed 25 percent.

The lack of reliance on banks means that savings are held in other assets. Lack of confidence, coupled with the lack of capital market alternatives open to the average investor (stocks, bonds, and derivatives), and the fact that not everybody has the financial sophistication

and volume of resources to open offshore accounts, has apparently led households to use real estate as a vehicle for financial investment. Although not fully liquid, the public considers it a safe asset in terms of property rights (unlike financial assets, real estate has not suffered expropriations of any sort) and protection against inflation and devaluations.

Figure 3. Financial Disintermediation: Argentina and South America
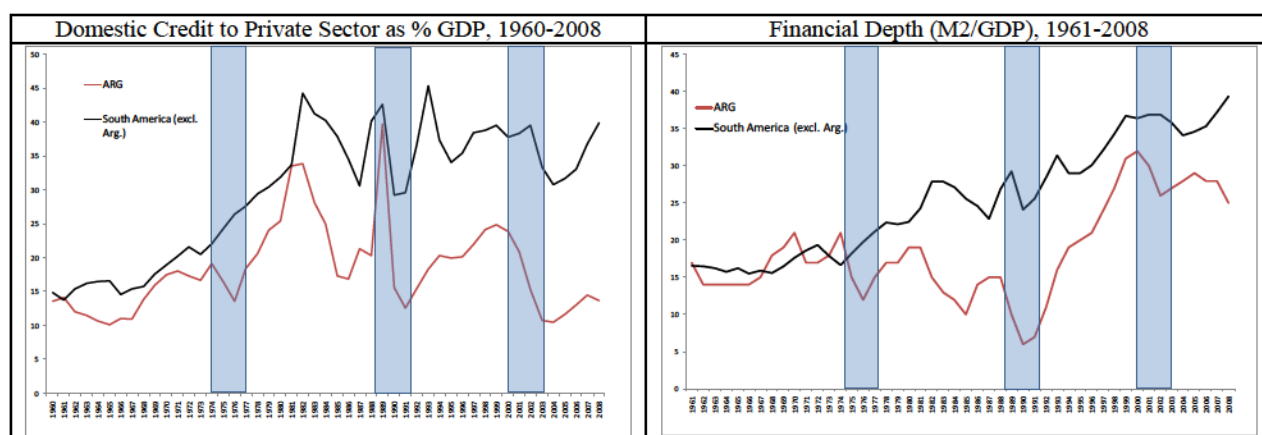
In an economy where real estate appears to have become the local safe asset, one should draw the following empirical predictions:[17]

1. The presence of real estate investors (as opposed to real estate consumers) should put upward pressure on house prices and thus reduce affordability, under the sensible assumption that investors have a much higher income than consumers and that the former self-finance their housing investments while the latter are more likely to need a mortgage or other kind of loan;

2. As a result of (1), the house ownership rate should drop, as the number of households falling into the category of real estate consumers is much larger than that of real estate investors;

3. Lower affordability takes a toll on the mortgage demand;[18]

---

[17] The safer an asset (housing) becomes relative to other assets (deposits), the lower should be its relative return. Since mortgages loans are financed with deposits, its interest rate will always exceed the deposit interest rate, which makes it unattractive from the investor's perspective to go into debt (mortgage) to buy a home.

[18] One may wonder why consumer households, instead of taking the binary decision of obtaining a mortgage loan of the desired size (to buy their target house/neighborhood) or no mortgage at all, do not adjust their leverage to buy an affordable unit. The answer is that such downgrade and loss of socioeconomic status would entail a large psychological burden, to the point that these people may decide to postpone the decision to own a house (see, for

4. Higher house prices, if also higher in terms of construction costs, should also encourage new construction; and

5. Larger supply, combined with the lower expected return on a safe asset, should diminish the rental value of housing.

Argentine data fits these predictions. Specifically, Figure 4 confirms prediction (1) by showing the positive trend in house prices in US dollar terms and as a ratio of per capita GDP, a raw inverse measure of affordability.

Figure 4. Recent Evolution of Housing Prices
Prices per square meter in three Buenos Aires City neighborhoods
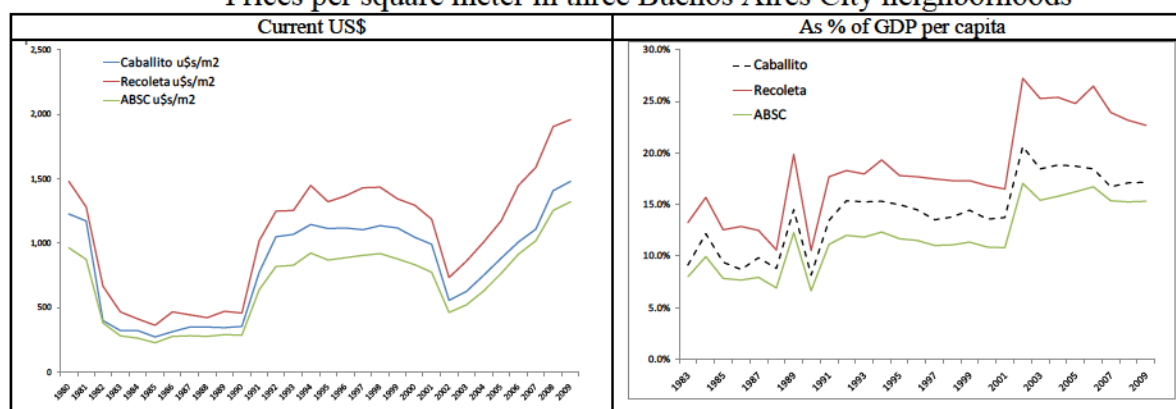
Source: Authors' based on data from Toribio Achaval and FIEL.

Figure 5 presents evidence on the remaining points. Figure 5A shows an increase, for the Buenos Aires region, in the square meters of rental supply for rental compared to the sales supply. In turn, Figure 5B shows that the increase in price of housing was stronger than in the cost of building, meaning that Tobin's q has gone up. Figure 5C displays the average number of monthly family incomes needed to buy a two-bedroom house, a ratio that is much higher in the 2000s than in the 1990s. Figure 5D shows that, on average, home ownership has fallen since the crisis.[19] This trend is explained by a rather flat life cycle ownership pattern for household heads above 30 years old at the time of the crisis, but particularly by a sharper fall in the ownership rate

example, Putnam, 1979, about residential location choices). As they are not flexible enough to opt for a more affordable alternative, they would remain renters (or live with parents or under similar housing arrangements). Such preferences reinforce the belief that the most binding constraint in the mortgage market is the lack of demand by middle-income households, the natural mortgage clientele, which is associated with affordability.
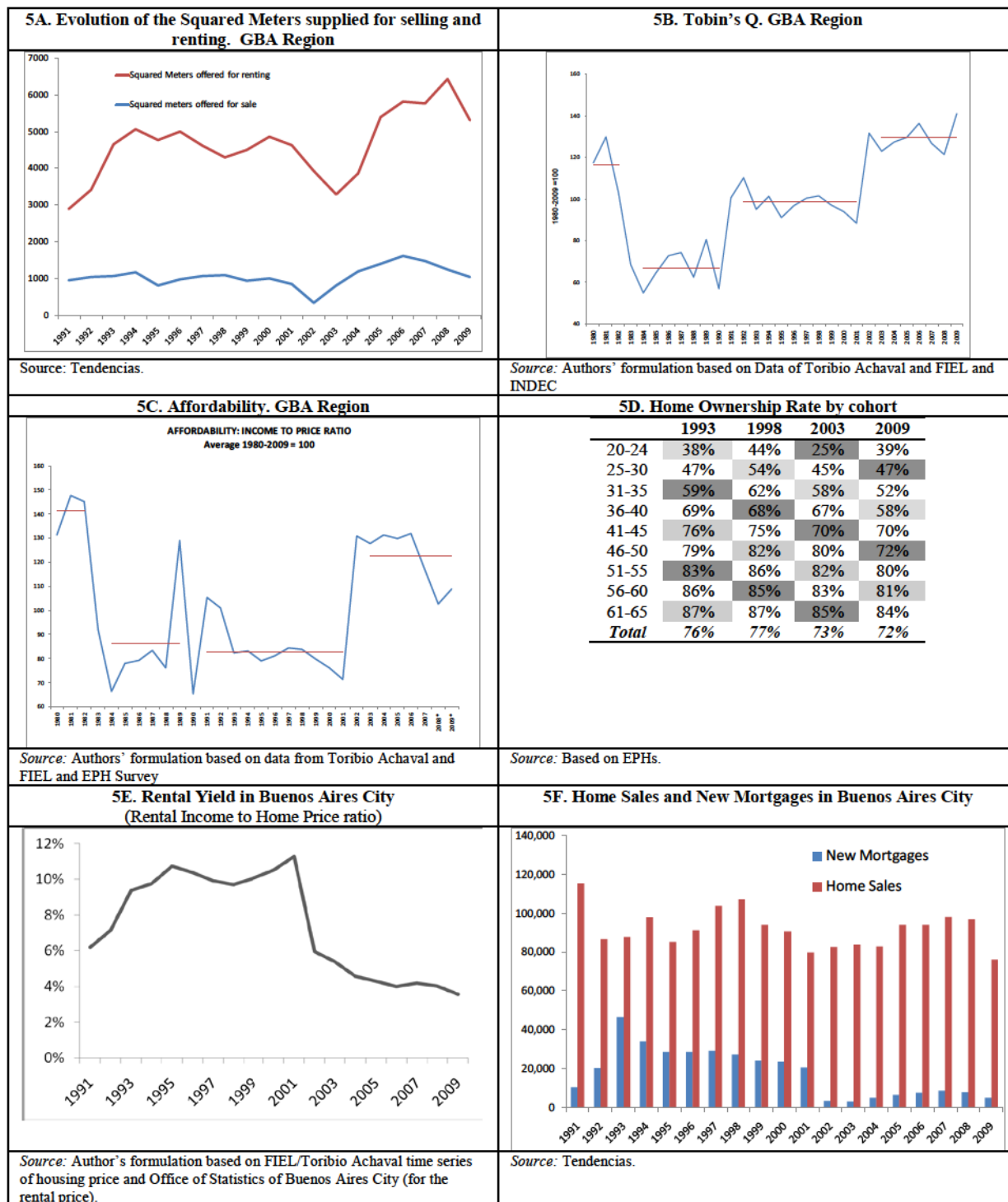
[19] Notice that the ownership rate in 1993 was close to the highest level for the whole 1993-2009 period. Since by 1993 the mortgage market had not taken off, this means that the high ownership rate in Argentina has little to do with mortgage market developments.

of younger households. For instance, in 1998, 54 percent of household heads between 25 and 30 years old were owners, and just 45 percent in 2003 (47 percent in 2009). Jointly breaking down figures by income and age (results available from the authors), the ownership rate dropped particularly for young middle income households (deciles 6-8 by total household income). These are the households that should be a priori more affected by affordability issues; households at the extremes of the income distribution, and individuals at the extremes of the age distribution, should be more immune to these housing market trends.[20]

Finally, 5E shows that the rental yield has fallen significantly after the crisis, and 5F shows that new mortgage loans have not followed the increase in home sales.

---

[20] We also tested whether household formation changed in the after crisis period. Our prior belief was that young people would emancipate at older age as housing become less affordable after the crisis. Simple test for average household formation rate does not show a significant difference. The lack of change might be explained by the relative fall of rental price. A deeper analysis, which is out of the scope of this paper, should take into account emancipation rates by income groups, since it is likely that affordability hit harder in middle income households.

Figure 5. Main Stylized Facts

5A. Evolution of the Squared Meters supplied for selling and renting. GBA Region	5B. Tobin's Q. GBA Region
Source: Tendencias.	Source: Authors' formulation based on Data of Toribio Achaval and FIEL and INDEC

5C. Affordability. GBA Region	5D. Home Ownership Rate by cohort

5C:

Source: Authors' formulation based on data from Toribio Achaval and FIEL and EPH Survey

5D:

	1993	1998	2003	2009
20-24	38%	44%	25%	39%
25-30	47%	54%	45%	47%
31-35	59%	62%	58%	52%
36-40	69%	68%	67%	58%
41-45	76%	75%	70%	70%
46-50	79%	82%	80%	72%
51-55	83%	86%	82%	80%
56-60	86%	85%	83%	81%
61-65	87%	87%	85%	84%
Total	*76%*	*77%*	*73%*	*72%*

Source: Based on EPHs.

5E. Rental Yield in Buenos Aires City (Rental Income to Home Price ratio)	5F. Home Sales and New Mortgages in Buenos Aires City
Source: Author's formulation based on FIEL/Toribio Achaval time series of housing price and Office of Statistics of Buenos Aires City (for the rental price).	Source: Tendencias.

To explore the affordability hypothesis in greater depth we finish this section by running a simple simulation exercise based on microdata from household surveys.[21] We estimate whether the family has enough income to obtain a mortgage necessary to buy a typical house for its type (according to family size and income decile) in 1999 and 2009. We adopt the following assumptions:

1. As we only have prices for relatively expensive neighborhoods of Buenos Aires City, we assume that the observed prices are those of houses for families in the top income decile, and then we re-compute house prices for other income deciles using expenditure on housing (rent) by decile based on microdata from the 1997 Household Expenditure Survey. Prices by decile are computed for 1999 and 2009.[22]

2. Households with housing needs are non-owners (i.e., renters and occupants) and owners living in houses of very low quality. The latter are those who own houses in the lowest 10 percent of the distribution of a quality index we constructed using factor analysis and five attributtes available in both surveys: the quality of floors, the existence of both running water and a bathroom inside the house, a flush toilet with some flushing mechanism and a connection to public sewerage.

3. Qualified households are those able to pay the installment-to-income ratio required by banking institutions. In the baseline simulation we only use formal income but we also perform simulations with a more flexible definition, adding to formal income 50 percent of informal income.[23]

The main results of our simulation exercise are shown in Table 5. As is clear, the share of potential borrowers collapsed in 2009 compared to 1999, explained mainly by a large increase in the relative price of housing to household income. For example, under a flexible definition of income, and considering a 15-year mortgage at a nominal interest rate of 8 percent,[24] with an 80 percent LTV and installment payments no greater than 30 percent of total income, the market

---

[21] This approach was followed in Gautier et al. (2006).
[22] In both cases we use the last sample of the year, that is, the second semester of 1999 and the last quarter of 2009.
[23] Technically the survey only identifies whether the worker contributes to the Social Security System or not.
[24] Other costs amount to 2 percentage points of the loan, which means that the effective interest rate reaches 10 percent annually for this case.

size ("would-be borrowers") collapsed from 30 percent in 1999 to just 7 percent in 2009. If instead we only take into account verifiable income (formal income), only 3.7 percent of households in 1999 and just 0.9 percent in 2009 would be able to obtain a mortgage in 2009 (in spite of a fall in informality from 52 percent in 1999 to 44 percent in 2009).

Table 5. Mortgage Loans Potential Demand
LTV 80% and installment ratio less than 30%

Loan Term (years)	Nominal interest rate							
	1999				2009			
	6.0%	8.0%	12.0%	14.0%	6.0%	8.0%	12.0%	14.0%
Market size (% of total households)								
10	13.0%	10.2%	5.5%	4.4%	2.0%	1.0%	1.0%	1.0%
15	40.0%	30.0%	13.6%	11.4%	8.8%	7.0%	4.0%	3.0%
25	50.0%	40.0%	17.0%	13.6%	15.7%	10.9%	4.9%	3.0%
Market size with formal income only (% of total households)								
10	2.2%	1.6%	0.7%	0.7%	0.9%	0.9%	0.0%	0.0%
15	6.9%	3.7%	1.6%	0.7%	1.9%	0.9%	0.9%	0.0%
25	19.4%	8.6%	2.2%	1.6%	1.9%	1.9%	0.9%	0.9%
Households with housing problems who could afford a loan (%)								
10	1.6%	0.9%	0.5%	0.5%	0.4%	0.4%	0.0%	0.0%
15	12.0%	3.6%	0.9%	0.9%	0.7%	0.4%	0.4%	0.4%
25	23.1%	12.0%	1.6%	0.9%	1.8%	0.7%	0.4%	0.4%

Source: Authors' estimates based on EPH (1999 and 2009) and ENGH (1997).

Another exercise is to simulate what would have happened if interest rates were lower (for instance, if indexation is allowed). At a 25-year loan term, an interest rate reduction from 12 percent to 6 percent, and taking into account a flexible definition of income, the potential market would increase from 4.9 percent to 16 percent of households. If the LTV falls from the 80 percent used in Table 5 to 60 percent, around 50 percent of households would be eligible for a loan.[25] Any of these credit market conditions would only benefit a tiny fraction of households suffering a housing deficit (not owners or low quality owners), given that they are concentrated in the lowest income strata.

3.3. Quality and Ownership

Given that both ownership rates and quality tend to rise *pari passu* with income, problems in the housing financial market should be more evident in young households (who depend more on

---

[25] Results are available from the authors.

financing). Several studies, notably Ortaló-Magné and Rady (1998),[26] and Chiuri and Japelli (2003),[27] analyze ownership over the life cycle.

In this section, we test whether, after controlling for demographic factors, proxies for income (permanent and transitory) and household location, the change in market conditions after the crisis affected the timing of home purchase and the quality of housing. We follow the Chiuri and Jappelli approach, estimating a probit model for ownership explained by demographic variables (age, squared age and cubic age; family size; marital status), income proxies (years of education as permanent income proxy; income decile as current income), a dummy for location and a control for housing quality. We use the EPH surveys for 2009 (post-crisis) and 1999 (pre-crisis).[28] We additionally construct a Housing Quality Index using factor analysis based on five attributes available in both surveys: the quality of floors, the existence of both running water and a bathroom inside the house, a flush toilet with some flushing mechanism and a connection to public sewerage.[29]

The results of this simple econometric exercise are displayed in Table 6. We merge both samples (1999 and 2009) in one database and then run a Probit regression for ownership (columns 1 and 2) and a OLS regression for quality (columns 3 and 4). In the first column we include quality as a regressor but not in the second to estimate the correlation between quality and ownership. The interacting dummy with quality is the time dummy (taking 1 for 2009 data). A similar approach is used for quality, as we include in column 3 a dumy for onwership and we exclude this variable in column 4.

Column 1 shows that onwership and quality are negatively correlated. The interacting dummy for 2009 shows a positive and significant effect, which means the trade-off between

---

[26] One important conclusion from Ortaló-Magné and Rady (1999) is that increases in the incomes of the youngest provoke a higher demand for small apartments, leading to capital gains for current owners, which allow them to go up on the property ladder (upsizing). Another implication is that during booms the average age of first-time buyers drops and vice versa.

[27] They use a large international dataset to study the determinants of housing tenure in 14 countries, with a dataset of 400,000 observations. Individual information is merged with country panel data on indicators of access to housing finance markets (the ratio of mortgage lending to GDP and the down payment ratio). The authors then proceed to estimate the age profile of home ownership controlling for individual country effects, time (or cohort) effects, demographic variables, proxies for permanent income and mortgage market indicators. They find evidence consistent with the hypothesis that mortgage market imperfections affect the age profile of home ownership, forcing the youngest to save and postpone home purchase for later; however, this effect is to some extent attenuated and then reversed at older ages.

[28] EPH is representative of the urban areas for the entire country: it covers 32 urban areas, and it is a stratified sample, with 16,300 and 24,700 observations for each period, respectively.

[29] Flush toilet has the highest weight and having a bathroom inside the lowest.

qualtiy and ownership is lower in 2009 (but still negative). The lower cofficient for 2009 means that a household has to sacrifice more quality to obtain ownership than in 1999. A symmetric result is found for the regression in columns 3 and 4. A difference between both regression is in education, a variable we use to proxy permanent income. More education is associated with better quality of homes, but not with ownership (i.e., more educated people prefer to live in a good quality house even when they have to rent).

The ownership rate in the 2009 sample is significantly lower than in 1999. As is standard in the literature, we find that younger households are less likely to be owners, and the probability of ownership increases with age. Comparing 2009 with 1999, we find that the life cyle of ownership is flatter, that is, in 2009 not only younger households were less likely to have a house, but also the increase in the probability with age is lower.

Both results together imply that the ownership rate pattern is different now than 10 years ago. In fact, the 2009 pattern fits the life-cycle pattern better today than a decade ago, which is by itself evidence of less affordable houses. Now more than before, at any age the probability of being owner is lower but increasing over time. Also, while it was formerly possible to sacrifice some quality in order to own a home, this trade-off is now less easily available, so that owning a home of similar quality home is less likely now than before.

The quality index grows with age, again fitting the life-cycle pattern. When we focus only on the subsample of owners, patterns are not different between the current and the past decade. This seems to be evidence that the quality trade-off did not change. Instead, what did change is that the likelihood of being an owner is lower regardless of the quality of the unit.

Table 6. Results

	Pr(owner=1)				Quality Index (min =0 ; max = 1)			
	dF/dx		dF/dx					
Age	0.0234	**	0.0194	**	0.0137	**	0.0184	**
	0.0035		0.0030		0.0041		0.0043	
Age^2	-0.0001		-0.0001		-0.0002	**	-0.0003	**
	0.0001		0.0001		0.0001		0.0001	
Age^3	0.0000		0.0000		0.0000	**	0.0000	**
	0.0000		0.0000		0.0000		0.0000	
Age*Dummy	-0.0215	**	-0.0187	**	-0.0054	**	-0.0033	
	0.0044		0.0043		0.0014		0.0024	
Age^2*Dummy	0.0004	**	0.0003	**	0.0001	**	0.0001	
	0.0001		0.0001		0.0000		0.0000	
Age^3*Dummy	0.0000	**	0.0000	**	0.0000	**	0.0000	
	0.0000		0.0000		0.0000		0.0000	
Permanent Income (Education)	0.0041		0.0032		0.0121	**	0.0119	**
	0.0045		0.0045		0.0024		0.0023	
Family Size	0.0191	**	0.0209	**	-0.0354	**	-0.0341	**
	0.0032		0.0034		0.0030		0.0034	
Married (=1 if yes)	0.0659	**	0.0659	**	-0.0059		-0.0043	
	0.0092		0.0096		0.0058		0.0043	
Current Income (Total Family Income)	0.0116	**	0.0113	**	0.0115	**	0.0102	**
	0.0007		0.0006		0.0018		0.0020	
Quality of Housing	-0.1511	**						
	0.0298							
Quality of Housing * Time Dummy (=1 if 2009)	0.1258	**						
	0.0313							
Time Dummy (=1 if 2009)	0.1892	**	0.2422	**	0.0362		0.0153	
	0.0721		0.0613		0.0326		0.0485	
Prop					-0.0191	**		
					0.0050			
Propd (= prop*year)					0.0163	*		
					0.0070			
Constant					0.5623	**	0.4639	**
					0.1024		0.1184	
Obs.	36,266		26,580		36,266		26,580	
Log pseudo-likelihood	-6545535.2		-6771042.3					
Pseudo R2	0.1265		0.1239		0.3327		0.3296	
Regional Dummies	Yes		Yes		Yes		Yes	

Figure 6. Age Profile

26
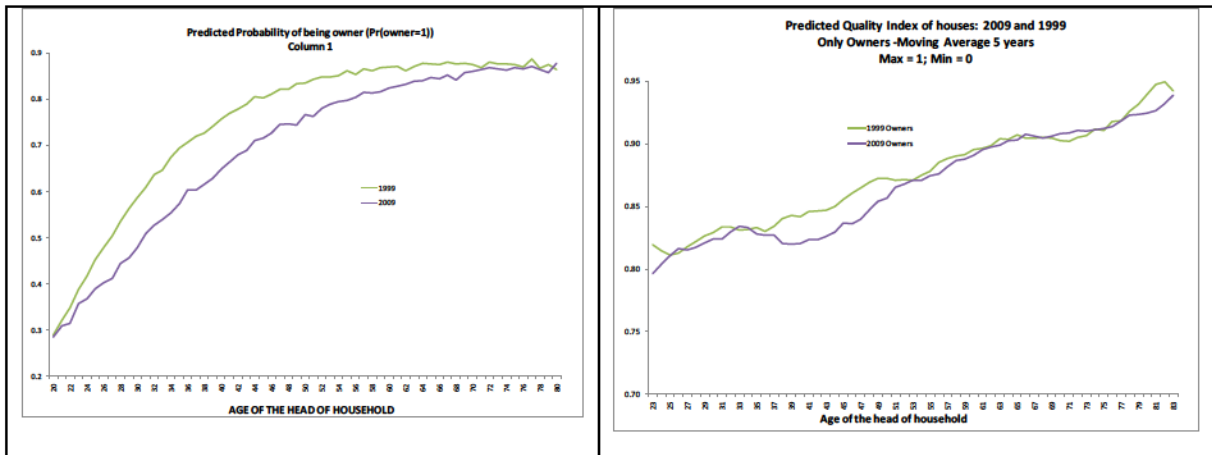
4. Analytical Model and Results

4.1 Data Used

We focus our analysis on the Buenos Aires Metropolitan Region (*Area Metropolitana de Buenos Aires*, AMBA), which comprises the autonomous city of Buenos Aires and the 24 municipalities in the suburbs (usually known as Greater Buenos Aires, GBA), representing approximately one third of Argentina's population. We use four different sources of microdata: the Household Consumption Survey, the national Household Survey (*Encuesta Permanente de Hogares*, EPH), SIEMPRO (*Sistema de Información, Evaluación y Monitoreo de Programas Sociales*) and our own specially designed survey (see Appendix for methodological details).

The Household Consumption Survey, a national-level survey that collects detailed information on household consumption, is conducted every 10 years and used by the Office of Statistics to construct the Consumer Price Index.[30] EPH is a household survey for the main urban centers which includes information about housing ownership and quality of housing, available for GBA since 1974. SIEMPRO, a living conditions survey which was carried out in 1997 and 2001, contains information about ownership, quality of housing and financing of housing (if the house was bought with financing, and the source of financing) for the entire country.

Our survey was conducted telephonically by randomly sampling over the universe of fixed telephone lines in AMBA; the sample consists of 1,600 households. Results on ownership rate and mean household characteristics are reassuringly consistent with EPH statistics. We repeated some SIEMPRO questions so as to be able to have updated information on key household characteristics, and we additionally included a new set of questions aimed at having a better grasp of housing finance and financial constraints in Argentina. For the latter, we follow the direct method, as developed originally by Jappelli (1990)[31]—or the similar approach used by Feder et al. (1989 and 1990). The approach of directly asking respondents about their rationing status was further refined by Baydas, Meyer and Aguilera-Alfred (1994), Zeller (1994), Kochar (1997), and Mushinski (1999). In this approach individuals can be classified into the following categories: i) unconstrained (either those not interested in applying for a mortgage or receiving

---

[30] In our simulations we use the 1997 Survey since the micro data of the 2006 Survey are not publicly available.

[31] Jappelli (1990) used the following question to determine credit rationing: "Was there any time in the past few years that you (or your husband/wife) thought of applying for credit at a particular place but changed your mind because you thought you might be turned down?"

the full loan amount requested), and ii) constrained (those manifesting an unmet demand for credit).

Table 7 compares our results (2010) and SIEMPRO results for AMBA (1997 and 2001). Our survey shows that ownership of both buildings and land has fallen over time (as suggested by the EPH survey as well), whereas ownership of just the building (usually building an auxiliary house in the house of a relative) has increased. Both trends were also observed between 1997 and 2001 according to SIEMPRO. We also observe an increase in the share of households renting (16.1 percent in 2010 compared to 12 percent in 2001) and a decrease in households occupying without paying rent. Squatting (unlawful settlement without title on land) increased between 2001 and 1997[32] and again between 2010 and 2001, which represents a worrisome trend.[33]

In regard to how households financed ownership, in 2010 only 20.2 percent of owners used any type of financing (including public housing programs and non-mortgage financing). This ratio is significantly higher than in 2001. Table 8 classifies households by type of financing for 2010. Only 10 percent of the owners resorted to mortgages (including both private and public banks), while personal loans (4 percent), loans from relatives (6 percent), and even public housing programs (0.5 represented) were equally negligible sources of finance. As a result, 79 percent did not use any loans at all, and over 90 percent of these households used their own savings to pay for housing.[34] SIEMPRO 1997 includes a question about source of financing, but with less accurate classification (for instance, it does not discriminate between mortgage loans and other type of loans). According to this survey, 0.64 percent of owners were financed through public housing programs, similar to the 2010 ratio (this low share of public programs in AMBA is due to the regional distribution of these programs, which are more important in other regions of the country, as shown in Figure 7.).

---

[32] According to SIEMPRO the increase in squatting between 1997 and 2001 occurred in all regions and not only AMBA.

[33] At the time of writing (December 2010), squatting has been widespread in AMBA region, with social conflicts and fights between neighbors and squatters. One of the most notorious was the appropriation of Indoamerican Park in the city of Buenos Aires by 8,000 peoples who attempted to settle there; three squatters were killed during the conflict.

[34] Of these 888 unleveraged households, only 3 households received their house from a government program and 100 inherited their houses.

## Table 7. Ownership and Finance in AMBA Region

	SIEMPRO 1997	SIEMPRO 2001	FIEL/CEDLAS 2010
Ownership rate	73.7	72.3	70.4
Owner of Building and Land	69.28	64.88	61.94
Owner of Building only	4.43	7.45	8.44
Renting	12.72	11.97	16.06
Squattering	1.37	1.83	2.19
Renting free	12.2	13.88	11.38
Bought/Built with financing (1)			
As % of owners	19.0	22.0	20.2
As % of total HH	14.0	15.9	14.2

Note: (1) refers to any source of financing: mortgage loan, personal loan, family loan or a government subsidy.

Table 8. Use of Loans to Buy the House, AMBA 2010

Type of Loan, if any	FIEL/CEDLAS 2010		SIEMPRO 1997
Mortgage loan	9.9%	Banking Loan	13.0%
Personal loan	4.1%	Mutual, Labor Union or realtor	1.76%
Family loan	6.3%		
Public housing program	0.5%	Public housing program	0.64%
Other loan	0.4%	Other loan	3.64%
Did not use any loan	78.9%	Did not use any loan	81.6%
Total number of owners	100.0%		100.0%

Figure 7. Source of Financing for Owner, SIEMPRO 1997
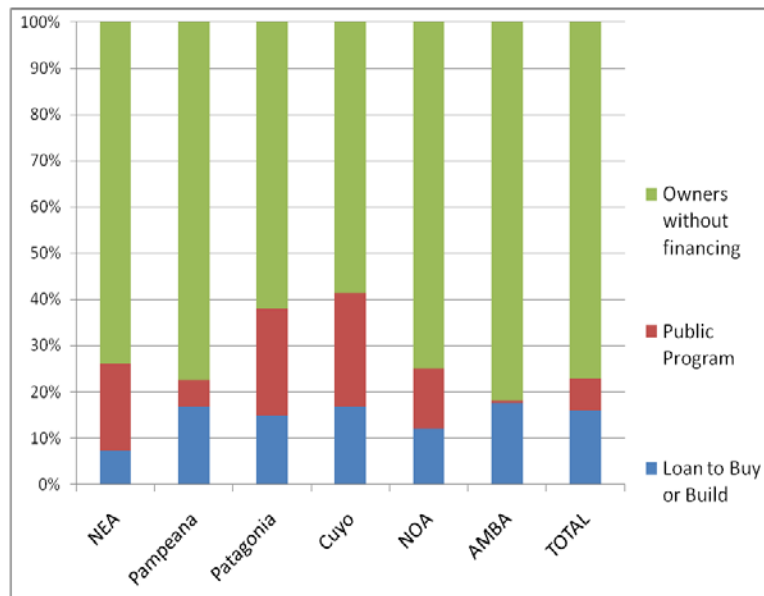
In terms of market share, the National Mortgage Bank (Banco Hipotecario Nacional, BHN) had 25 percent of the market in 1997 and 21 percent in 2010. Other public banks (particularly Banco Nación and Banco de la Provincia de Buenos Aires) have gained share in 2010, as have private banks. Only non-banking institutions have lost share.

Table 9. Distribution of Loans by Lending Institution, AMBA 1997 and 2010

	SIEMPRO 1997	FIEL/CEDLAS 2010
Private bank	14.87	35.90
Public bank (excluding Banco Hipotecario)	23.48	33.33
Banco Hipotecario	25.31	21.37
Non-bank financial institutions	32.98	4.27
Public housing program	3.36	5.13
Total	100.00	100.00

Note: 1997 is based on SIEMPRO who asks loans in general and not mortgage loans. 2010 is based in our survey and it refers specifically to mortgage loans. Public housing programs are not mortgage loans but they are included in the table as reference.

Table 10 shows approval rates by lending institution. They range from 85 percent in public banks to 63 percent in private banks and 53 percent for Banco Hipotecario (with both public and private ownership).

Table 10. Mortgage Lending Institutions, GBA 2010

Financial Institution	Number of applications	*In %*	Number of loans granted	*In %*	*% of accepted applications*
Private bank	67	*39.6%*	42	*37.8%*	*62.7%*
Public bank (excluding Banco Hipotecario)	46	*27.2%*	39	*35.1%*	*84.8%*
Banco Hipotecario	47	*27.8%*	25	*22.5%*	*53.2%*
Non-bank financial institutions	9	*5.3%*	5	*4.5%*	*55.6%*
Total	169	*100.0%*	111	*100.0%*	*65.7%*

4.2. Demand for Mortgage Loans in Argentina: New Survey Evidence

As observed loan volumes are not directly informative of the underlying demand and supply forces, a household survey is a highly useful tool for revealing preferences and impediments to demand. In this section we report findings on self-reported demand for mortgages and seek to identify some sociodemographic factors behind the decision to apply for a loan and the reasons why some households are excluded from this kind of credit.[35]

We classify households into two groups. The first consists of households with a demand for mortgages, which include some that have applied to a loan and others that have not. Among those that actually applied, some obtained the loan (with a subset getting as much as they wanted to) and others were rejected. Financially constrained households are defined as those with a revealed demand for a mortgage that either decided not to ask for a loan or that applied and were turned down. The second group consists of households without a demand for mortgages, including those stating they did not need or did not want loan.

The results, displayed in Table 11 and Table 12, seem to defy common sense but are in reality very much in line with other enterprise credit surveys (see, for example, Bebczuk, 2010). The following results are of particular interest:

1. Only 43 percent of households want mortgage loans, and only 27 percent applied for them.

2. Suggesting a great deal of self-selection, 64 percent of these applications were successful, and 95 perceived of successful applicants obtained as much credit as they asked for. The main reason for not applying, according to 84 percent of this subset of households, is potential failure to not meet banks' minimum requirements. In other words, affordability seems to be a major issue in the Argentine mortgage market.

3. As discussed in Table 13, of the 57 percent of households not interested in obtaining a mortgage, 70 percent said they did not need one. Reasons for not needing a mortgage include being able to save (48 percent), having inherited a house (17 percent), or not wanting a mortgage for other reasons (23 percent).

---

[35] For this section we limit the analysis to those households with information on all questions, which reduces the sample size to 1,501. The 99 missing households do not have any particular pattern and are considered as missing at random.

Reasons cited by the latter group include reluctance to get into debt (75 percent) or finding a mortgage too risky or otherwise unattractive.

4. Central to this study, financially constrained families represent 36 percent of of the total. Table 14 in turn considers mortgage applications according to the year they were submitted.

Table 11. Self-Reported Demand for Mortgages

Response	Row	In % of total
Has/Had demand for a mortgage	(1)	43.3%
Did not apply to a loan	(2)	31.8%
Applied to a loan	(3)	11.5%
Got the loan	(4)	7.4%
Did not get the loan	(5)	4.1%
Got the desired loan amount	(6)	7.1%
Has/Had no demand for a mortgage	(7)	56.7%
Did not need the loan	(8)	39.7%
Did not want a loan	(9)	13.1%
Other unspecified reasons	(10)	3.9%
Total usable responses (1,501 cases)	(11)	100.0%
Ratios	*Rows*	*In %*
Demand/Total responses	[(1)/(11)]	43.3%
Applications/Demand	[(3)/(1)]	26.6%
Successful applications/Total applications	[(4)/(3)]	64.2%
Financially constrained/Total	[{(2)+(5)}/(11)]	35.9%
Desired loan amount/Successful applications	[(6)/(4)]	95.5%
Do not need/No demand	[(8)/(7)]	70.0%
Do not want/No demand	[(9)/(7)]	23.0%

Table 12. Reasons Offered for Not Applying or Not Having Demand for a Mortgage

Reasons	Number of cases	In %
Has demand but did not apply:		
Knew they would not grant the loan because did not meet the minimum requirements	410	86.0%
The offered mortgage loan amount was not enough to buy the desired house	7	1.5%
Does not have enough savings for the down payment	60	12.6%
Total	477	100.0%
Does not need:		
Has capacity to save	285	47.8%
Has family or friends to borrow from	59	9.9%
Inherited the house	100	16.8%
Does not want to be an owner	16	2.7%
Other unspecified reasons	136	22.8%
Total	596	100.0%
Does not want:		
Prefers avoiding debt	148	75.5%
Is afraid of being unable to repay in the future	31	15.8%
Loan conditions were unattractive	17	8.7%
Total	196	100.0%

Table 13. Reasons Offered for Not Applying or Not Having a Demand for a Mortgage by type of tenant

Response (in number of cases)	Total	Owns	Rents	Occupies without rent
Has/Had demand for a mortgage	650	353	180	117
Did not apply to a loan	477	242	140	95
Applied to a loan	173	111	40	22
Got the loan	111	89	0	0
Did not get the loan	62	22	40	22
Has/Had no demand for a mortgage	851	674	77	100
Did not need the loan	596	489	38	69
Did not want a loan	196	147	31	18
Other unspecified reasons	59	38	8	13
Total usable responses	1,501	1,027	257	217

The total of 173 applications were more or less evenly distributed over three subperiods: before 1991 (36 percent), between 1991 and 2001 (27 percent) and between 2002 and 2010 (33 percent). Accepted applications dropped from 90 percent in the first sub-period to 70 percent in the second, during the Convertibility Plan, to a record low of 33 percent in the post-Convertibility era. We asked the main reason for the loan rejection, as shown in Table 14b, finding that the most common reason is lack of income. The lower approval rate in the 2000s is not due to bank refusal; on the contrary, lack of income is the main reason in the 2000s even more than in the 1990s, probably influenced by successive official announcements of seemingly accessible mortgage plans for lower income families, which encouraged some of them to apply for otherwise unaffordable loans.

Although the survey asks about both past demand (by those who are presently homeowners) and current demand (by those who are not yet owners), it is interesting to note in Table 14a that the latter group displays higher demand than present owners seem to have had in the past. Specifically, 70 percent of renters and 54 percent of occupants without rent, but only 34 percent of owners, express demand for mortgages. However, the percentage of applicants is not that different: 16 percent of renters and 10 percent of occupants without rent asked for a loan, compared to 11 percent in the case of owners. This means that, despite the differences in demand, self-exclusion prevents many potential borrowers from tapping the banking system.

Table 14a. Mortgage Loan Applications over Time

Mortgage Applications/Period	Total	Before 1991	1991-2001	2001-2010	Unspecified date
Applied to a mortgage loan	173	63	47	57	6
In % of total applications	*100%*	*36%*	*27%*	*33%*	*3%*
Obtained loan	111	57	33	19	2
Obtained desired loan amount	104	53	31	18	2
Did not obtain loan	62	6	14	38	4
% of rejected applications	36%	10%	30%	67%	67%
% of accepted applications	64%	90%	70%	33%	33%
% of accepted applications with desired loan amount	94%	93%	94%	95%	100%

Table 14b. Main Reason for Rejection

Reason	1994-2000	2003-2010
Do not have enough income	64%	83%
Satisfied the requirement but bank refused anyways	14%	2%
House I want to buy was not approved	7%	5%
They offered an amount lower than what I needed	14%	10%
Total Rejected	100%	100%
Approval Rate	70%	33%

Finally, we would like to know, on the basis of the information collected during the same survey, whether mortgage demand and access is associated to some household characteristics. Table 15 reproduces data on household head age, education and occupation, household income and socioeconomic level and wealth (proxied in this case by car ownership), as well as the number of children under 18. In turn, Table 16 reports mean difference tests on the binary variables presented in Table 15 By and large, these tests indicate that demand, access to credit and financial constraints appear to be correlated to different measures of income and wealth, including household head higher education, self-reported income, socioeconomic level and car

ownership, but no other household features differ significantly. This again reinforces the key role of affordability in mortgage demand decisions.

Table 15. Household Characteristics

Variable	Whole Sample (1,501 cases)	
	Mean	**Standard Deviation**
Household head age<30	0.022	0.147
Household head age [31-50]	0.151	0.358
Household head age [51-65]	0.119	0.324
Household head age>65	0.708	0.455
No children under 18	0.418	0.493
3-4 children under 18	0.076	0.265
1-2 children under 18	0.326	0.469
More than 5 children under 18	0.015	0.123
HH education: Primary completed	0.288	0.453
HH education: Secondary completed	0.440	0.497
HH education: Tertiary completed	0.272	0.445
Unskilled worker	0.043	0.204
Retired	0.067	0.251
Entrepreneur	0.019	0.135
Skilled worker	0.617	0.486
Unemployed	0.027	0.161
Contributes to social security	0.537	0.499
Monthly income below AR$2,000	0.273	0.446
Monthly income below [AR$2,000-AR$5,000]	0.382	0.486
Monthly income below [AR$5,000-AR$10,000]	0.083	0.275
Monthly income above AR$10,000	0.015	0.120
High socioeconomic level	0.176	0.381
Middle socioeconomic level	0.351	0.477
Low socioeconomic level	0.473	0.499
Has no car	0.710	0.454
Has one car	0.270	0.444
Has 2 or more cars	0.021	0.142

Table 16. Mortgage Demand and Household Characteristics

Variable	Mean Difference Tests: t-statistic		
	[Demand=1]-[Demand=0]	[Accepted=1]-[Accepted=0]	[Constrained=1]-[Constrained=0]
Household head age<30	0.388	-0.841	0.825
Household head age [31-50]	-0.184	-0.875	-0.163
Household head age [51-65]	-0.128	0.856	-0.029
Household head age>65	0.100	0.664	-0.131
No children under 18	0.938	-0.038	0.945
3-4 children under 18	1.793	1.217	0.485
1-2 children under 18	-0.404	-0.979	0.218
More than 5 children under 18	0.883	0.000	1.262
HH education: Primary completed	1.373	-1.529	*2.185*
HH education: Secondary completed	1.235	*-2.632*	1.921
HH education: Tertiary completed	*-2.427*	*4.251*	*-3.844*
Unskilled worker	*2.342*	0.317	*1.991*
Retired	1.528	-1.023	1.908
Entrepreneur	*-2.340*	-1.206	-1.933
Skilled worker	-0.065	-0.597	0.371
Unemployed	0.241	1.152	-0.014
Contributes to social security	-0.719	-1.129	-0.602
Monthly income below AR$2,000	1.941	-0.828	*2.467*
Monthly income below [AR$2,000-AR$5,000]	*2.185*	*-2.978*	*3.250*
Monthly income below [AR$5,000-AR$10,000]	-0.273	*3.039*	*-2.213*
Monthly income above AR$10,000	*-2.258*	1.152	*-2.688*
High socioeconomic level	-1.244	*3.178*	*-3.216*
Middle socioeconomic level	-0.904	-1.737	-0.074
Low socioeconomic level	1.922	-1.192	*2.714*
Has no car	*2.666*	*-2.860*	*3.954*
Has one car	*-2.392*	*2.848*	*-3.587*
Has 2 or more cars	-1.075	0.220	-1.437

(*) Differences in bold and italics are statistically significant at 5% or less.

To close, we run in Table 17 a Heckman estimation to control for endogeneity bias via a two-step regression, where the first stage estimates a demand (or selection) equation and an access (or financial constraint) equation in the second stage.[36] To ensure the correspondence between demand and household characteristics, we restrict the analysis to households that became owners since 2002 onwards or still do not own a house. Although we tried several specifications, the only variables that proved to be robustly significant were a high socioeconomic level (with the expected positive sign) in the access equation and tertiary education and no car ownership, with negative and positive loadings respectively, in the demand equation. This econometric evidence confirms the preliminary verdict from the previous descriptive statistics.

Table 17. Access and Demand for Mortgage Loans
Heckman Two-Stage Estimation

Access (financial constraint) equation	
High socioeconomic level	-0.154
	(-2.26)
Low socioeconomic level	-0.034
	(-0.65)
Constant	1.299
	(6.04)
Selection (demand) equation	
Tertiary education completed	-0.234
	(-1.84)
No car ownership	0.287
	(2.13)
Constant	0.042
	(0.32)
Wald test (p-value)	5.22
	(0.073)
Number of observations	448
Censored observations	196
Uncensored observations	252

---

[36] For a previous application of this methodology to study credit constraints for firms, see Bigsten, Collier and Dercon (2000).

5. Conclusions and Policy Implications

This paper has studied housing finance in Argentina, with an emphasis on demand for mortgage loans and developments following the 2001-2002 crisis. Both macro data and survey information were employed, including the results of the survey especially designed for this study. By analyzing the demand for mortgage loans we uncovered that in addition to the standard financial disintermediation argument (supply side) to explain mortgage market underdevelopment in volatile economies, demand plays a very important role as well. The main findings are the following:

1. Despite the shrinking size of the mortgage market after the crisis, housing prices and construction has boomed in Argentina.

2. The contraction of the mortgage market in the 2000s compared to the 1990s cannot be attributed to inadequate regulations or lack of loanable resources in the banking system.

3. On the contrary, market developments are consistent with a lack of demand for mortgages, which have become unaffordable for a large percentage of the population.

4. In turn, diminished affordability is associated with segmentation among buyers: as housing has become a safe asset (in the sense of being expropriation-free when compared to bank deposits and other financial assets), investors' strong demand prevents households in search of a residence from being eligible for a mortgage loan.

5. While middle-income households prefer renting to moving to a worse quality unit or a worse location, low income households accept such a trade-off.

6. Regardless of the lack of a dynamic mortgage market, home ownership continues to be around 70 percent, although the rate has declined since the 1990s.

7. The high ownership rate reflects widespread use of own funds to buy a house, willingness to reduce the dwelling quality in order to own and government assistance via housing programs targeting low to middle-income households. Other recent interventions in the mortgage market were mostly ineffectual.

8. Ownership rate is considerably lower in middle income households with young heads;

9. The survey carried out for this study confirmed many of these statements, showing in particular that the demand for external finance is extremely low.

These results show that, in the face of the acute affordability problem, policies aimed at fostering the supply side of mortgages, as the Government has tried to do in recent years by providing loanable funds to the banking system, are bound to turn out ineffective. Even the current environment of low real interest rates is unlikely to overcome the lack of demand; our exercises on affordability attest to the fact that a very small portion of households would be eligible for a mortgage, even under favorable interest rate levels and lax LTV requirements. On the other hand, public housing programs are not suitable for a large percentage of the population. The apparent major constraint from the demand (vis-à-vis the supply) side calls for a different set of policies. Policies designed to increase the amount of urban land with proper infrastructure would increase the supply of housing, particularly for the poor, and relax the affordability problem. Moreover, policies that foster the market for rental housing could address investors' desire to buy housing and increase non-owners' likelihood of renting a high-quality unit. Finally, if further promotion of the mortgage market is needed, conditions must be made more favorable for demand; in particular, the affordability issue is likely to persist in the medium run (at least until conventional financial assets are again massively accepted by local investors as a store of value). Those can be achieved through the introduction of new instruments or demand subsidies to complement, or even partly substitute for, ongoing government housing programs. Of course, this must be weighed against the resulting fiscal burden and the opportunity costs in terms of other badly needed social expenditures.

References

Agarwal, S., S. Chomsisengphet and O. Hassler. 2005. "The Impact of the 2001 Financial Crisis and the Economic Policy Responses on the Argentine Mortgage Market." *Journal of Housing Economics* 14(3): 242-270.

Auguste, S. et al. 2006. "Cross-Border Trading as a Mechanism for Implicit Capital Flight: ADRs, CEDEARs, and the Argentine Crisis." *Journal of Monetary Economics* 53(7): 1259-1295.

Banzas, A., and L. Fernández. 2007. "El Financiamiento a la Vivienda en Argentina: Historia Reciente, Situación Actual y Desafíos." Documento de Trabajo 18. Buenos Aires, Argentina: Centro de Economía y Finanzas para el Desarrollo de la Argentina (CEFIDAR).

Baydas, M.M., R.L. Meyer and N. Aguilera-Alfred. 1994. "Discrimination against Women in Formal Credit Markets: Reality or Rhetoric?" *World Development* 22(7): 1073-1082.

Bebczuk, R. 2010. "Acceso al Financiamiento de las PYMES en Argentina: Estado de Situación y Propuestas de Política." Serie Financiamiento del Desarrollo 227. Santiago, Chile: United Nations Ecomomic Commission for Latin America and the Caribbean.

Bebczuk, R., J.M. Fanelli and J. Pradelli. 2003. "Determinants and Consequences of Financial Constraints Facing Firms in Argentina." In: A. Galindo and F. Schiantarelli, compilers. *Credit Constraints and Investment in Latin America*. Washington, DC, United States: Inter-American Development Bank.

Bigsten, A., P. Collier and S. Dercon. 2000. "Credit Constraints in Manufacturing Enterprises in Africa." Working Paper. Oxford, United Kingdom: University of Oxford, Centre for the Study of African Economies.

Central Bank of Argentina. Various dates. *Comunicaciones "A"*. Buenos Aires, Argentina: Central Bank of Argentina.

Chiquier, L., and M. Lea. 2009. *Housing Finance Policy in Emerging Economies*. Washington, DC, United States: World Bank.

Chiuri, M.C., and T. Japelli. 2003. "Financial Market Imperfections and Home Ownership: A Comparative Study." *European Economic Review* 47: 857–875.

Cristini, M., and M. Iaryczower. 1997. "Un Análisis Económico de las Políticas de Vivienda en la Argentina: El FO.NA.VI." Buenos Aires, Argentina: Asociación Argentina de Economía Política. Available at: http://www.aaep.org.ar/espa/anales/pdf/cristini_iaryczower.pdf

Cristini, M., and R. Moya. 2004. "Las Instituciones del Financiamiento de la Vivienda en Argentina." Research Department Working Paper 498. Washington, DC, United States: icano de Desarrollo, Washington, D.C. 2004.

Cristini, M., and R. Moya. 2008. "Ciudades y Calidad de Vida en América Latina y el Caribe: Evolución Histórica y Comparación Internacional." Background paper for 2009 Development in the Americas *Beyond Facts: Understanding Quality of Life*. Washington, DC, United States: Inter-American Development Bank.

Cuenin, F., and R. Moya. 2010. "Housing Policy Matters for the Poor." Washington, DC, United States: Inter-American Development Bank. Mimeographed document.

Delfiner, M. 2010. "El Mercado de Derivados en Argentina." In: R. Bebczuk, editor. *Progresos en Finanzas*. Buenos Aires, Argentina: Asociación Argentina de Economía Política/Editorial Temas.

Delgobbo, A. 2000. "Balance sobre la Conformación de un Mercado de Hipotecas Titulizadas en Argentina." Buenos Aires, Argentina: Ministerio de Economía, Secretaría de Defensa de la Competencia y del Consumidor.

Duca, J.V., and S.S. Rosenthal. 1994. "Borrowing Constraints and Access to Owner-Occupied Housing." *Regional Science and Urban Economics* 24(3): 301-322.

Feder, G. et al. 1989. "Agricultural Credit and Farm Performance in China." *Journal of Comparative Economics* 13: 508-526.

Feder, G. et al. 1990. "The Relationship between Credit and Productivity in Chinese Agriculture: A Microeconomic Model of Disequilibrium." *American Journal of Agricultural Economics* 72: 1151-1157.

Fisher, L.M., and A.J. Jaffe. 2003. "Determinants of International Home Ownership Rates. *Housing Finance International* 18(1): 34-42.

Gaba, E. et al. 2003. "Indexación en Chile y su Posible Aplicación en Argentina." Serie de Estudios Económicos. Buenos Aires, Argentina: BBVA Banco Francés.

Galindo, A., and E. Lora. 2005. "Foundations of Housing Finance." In: *Unlocking Credit: The Quest for Deep and Stable Bank Lending*. Baltimore, United States: Inter-American Development Bank/Johns Hopkins University Press.

Gautier, M. et al. 2006. "Review of Argentina's Housing Sector: Options for Affordable Housing Policy." Policy Research Working Paper. Washington, DC, United States: World Bank.

Gwin, C.R., and S.E. Ong. 2008. "Do We Really Understand Homeownership Rates? An International Study." *International Journal of Housing Markets and Analysis* 1(1): 52-67.

Hassler, O. 2007. "Instruments for Improving the Soundness and Depth of Housing Finance." Presentation at the Central Bank of Argentina, Buenos Aires, Argentina.

Jappelli, T. 1990. "Who Is Credit Constrained in the U.S. Economy." *Quarterly Journal of Economics* 105: 219-234.

Kiguel, M.A., and E. Podjarny. 2007. "Impacto de Factores Macro y Microeconómicos en el Desarrollo del Mercado de Hipotecas: Reflexiones Basadas en Argentina, Chile y Uruguay." Serie de Estudios Económicos y Sociales CSC 07-010. Washington, DC, United States: Inter-American Development Bank.

Kochar, A. 1997. "An Empirical Investigation of Rationing Constraints in Rural Credit Markets in India." *Journal of Development Economics* 53: 339-371.

Moya, R., G. Bermúdez and A. Sparacino. 2010. "¿Están los Programas de Vivienda Llegando a los Pobres? El Caso Argentino." Washington, DC, United: Inter-American Development Bank. Mimeographed document.

Mushinski, D.W. 1999. "An Analysis of Offer Functions of Banks and Credit Unions in Guatemala." *Journal of Development Studies* 36: 88-112.

Ortalo-Magné, F., and S. Rady. 1999. "Boom in, Bust Out: Young Households and the Housing Price Cycle." *European Economic Review* (4-6): 755-766.

----. 2006. "Housing Market Dynamics: On the Contribution of Income Shocks and Credit Constraints." *Review of Economic Studies* 73(2): 459-485.

Putnam, S.H. 1979. *Urban Residential Location Models*. New York, United States: Springer.

Sanders, A.B. 2005. "Barriers to Homeownership and Housing Quality: The Impact of the International Mortgage Market." *Journal of Housing Economics* 14: 147-152

Warnock, V.C., and F.E. Warnock. 2008. "Markets and Housing Finance." *Journal of Housing Economics* 17(3): 239-251.

Zeller, M. 1994. "Determinants of Credit Rationing: A Study of Informal Lenders and Formal Credit Groups in Madagascar." *World Development* 22: 1895-1907.