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The Demand for Mortgages under Macro Volatility:

The Argentine Case

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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

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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

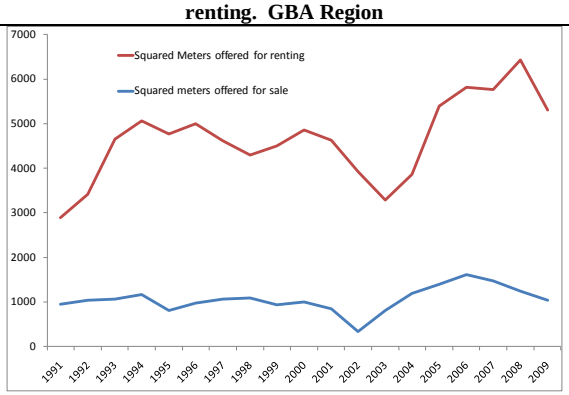
of younger households. For instance, in 1998, 54 percent of household heads between 25 and 30 years old were owners, and just 45 percent in 2003 (47 percent in 2009). Jointly breaking down figures by income and age (results available from the authors), the ownership rate dropped particularly for young 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

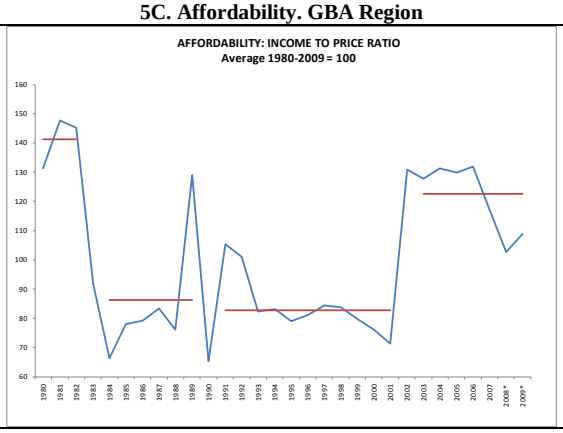


Source: Tendencias.

5B. Tobin's Q. GBA Region

Source: Authors' formulation based on Data of Toribio Achaval and FIEL and INDEC

5C. Affordability. GBA Region



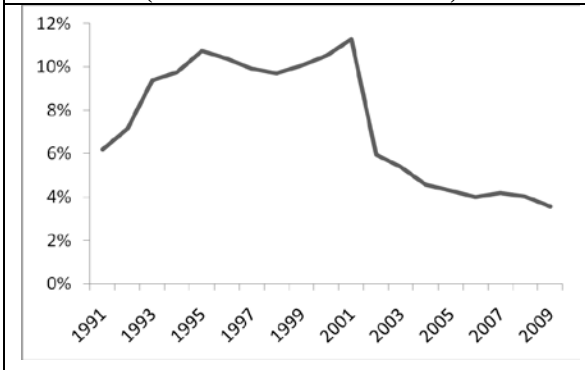
Source: Authors' formulation based on data from Toribio Achaval and FIEL and EPH Survey

5D. Home Ownership Rate by cohort

	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%***

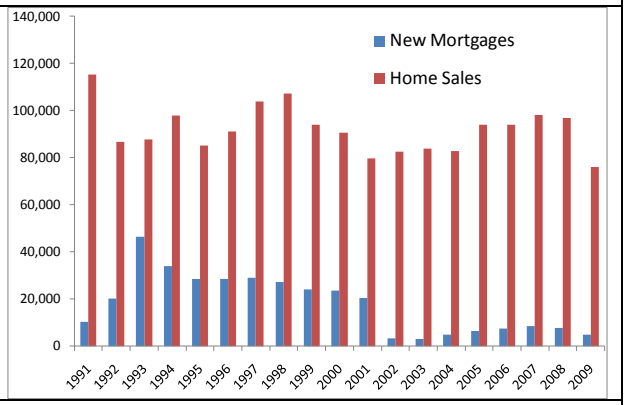
Source: Based on EPHs.

5E. Rental Yield in Buenos Aires City
(Rental Income to Home Price ratio)



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).

5F. Home Sales and New Mortgages in Buenos Aires City



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 6.0%	8.0%	12.0%	14.0%	2009 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.

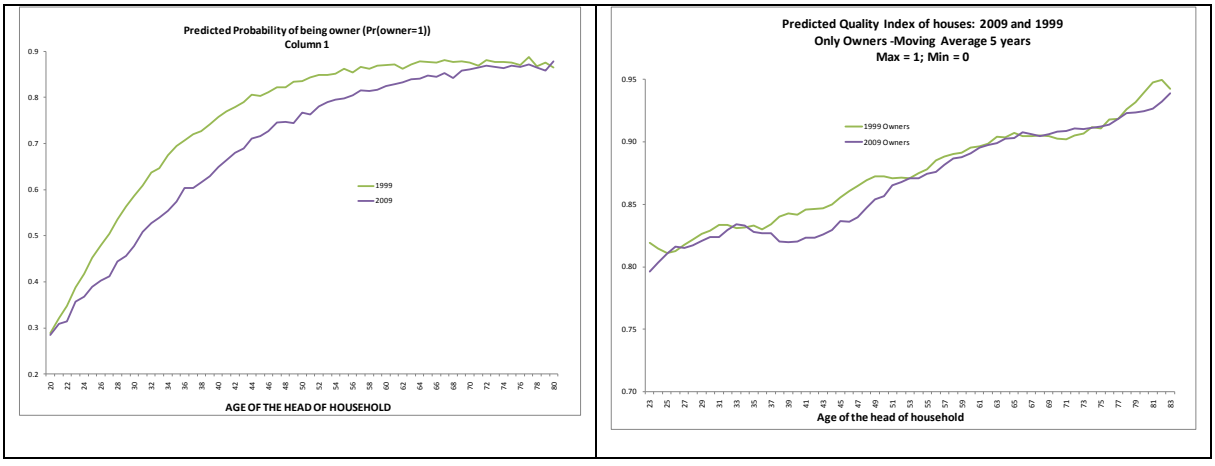
Both results together imply that the ownership rate pattern is different now than 10 years ago. In fact, the 2009 pattern fits the life-cycle pattern better today than a decade ago, which is by itself evidence of less affordable houses. Now more than before, at any age the probability of being owner 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

	Dependent variable							
	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



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

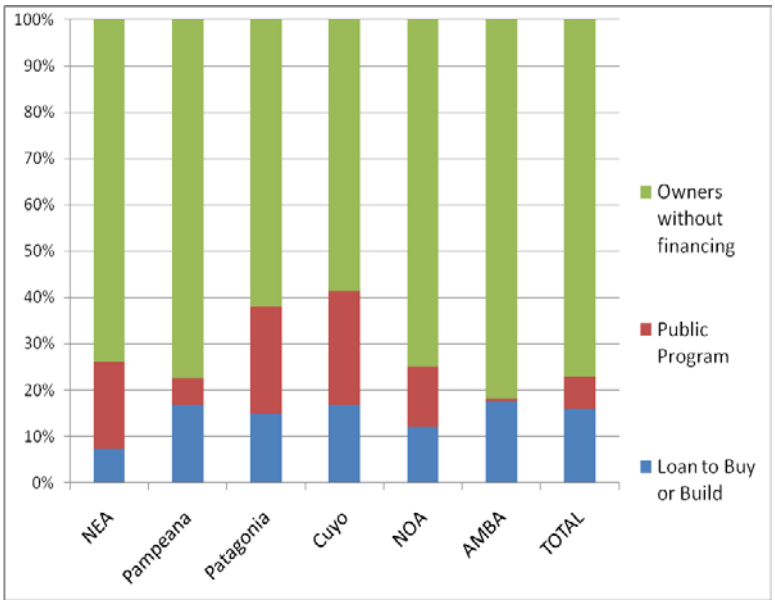
	SIEMPRO 1997	SIEMPRO 2001	FIEL/CEDLAS 2010
Ownership rate	**73.7**	**72.3**	**70.4**
Owner of Building and Land	69.28	64.88	61.94
Owner of Building only	4.43	7.45	8.44
Renting	12.72	11.97	16.06
Squattering	1.37	1.83	2.19
Renting free	12.2	13.88	11.38
Bought/Built with financing (1)			
As % of owners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