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Argentina's Housing Market in the 2000s

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Abstract*

In the last three decades, the supply of housing in Argentina has not kept pace with demand. This study analyzes the main drivers of Argentina's housing market and relates them to the macroeconomic environment in order to advance a policy agenda for housing policy reform. The demand for housing was calculated and tenure choice was analyzed. Structural characteristics affecting Argentina's housing market include the high concentration of the urban population in a few large metropolitan areas, the association of urban poverty with the housing deficit, and overcrowding. The mortgage market lost its appeal following the 2001-02 crisis due to widespread breaches of contract legitimized through protective legislation (still in place), insufficient long-term financing, and high inflation. The housing deficit could be eliminated in five to eight years if well-coordinated policy initiatives to develop the mortgage market and provide low-income housing were adopted under a decentralized, demand-driven, subsidized program.

JEL Classification: O54, R21, R23, R28, R30, R31, R38, R58
Keywords: Argentina, housing, housing demand, housing deficit, housing finance, tenure choice, mortgage market social housing policy.

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1. Introduction

Argentina is a highly urbanized country. About 70 percent of the country's economic activity as measured by GDP and some 50 percent of businesses (manufactures and services) are concentrated in the seven largest metropolitan areas. This spatial distribution of the population translates into a variety of local housing markets, each with its own characteristics, depending on local growth and development, employment opportunities, geography, and other factors.

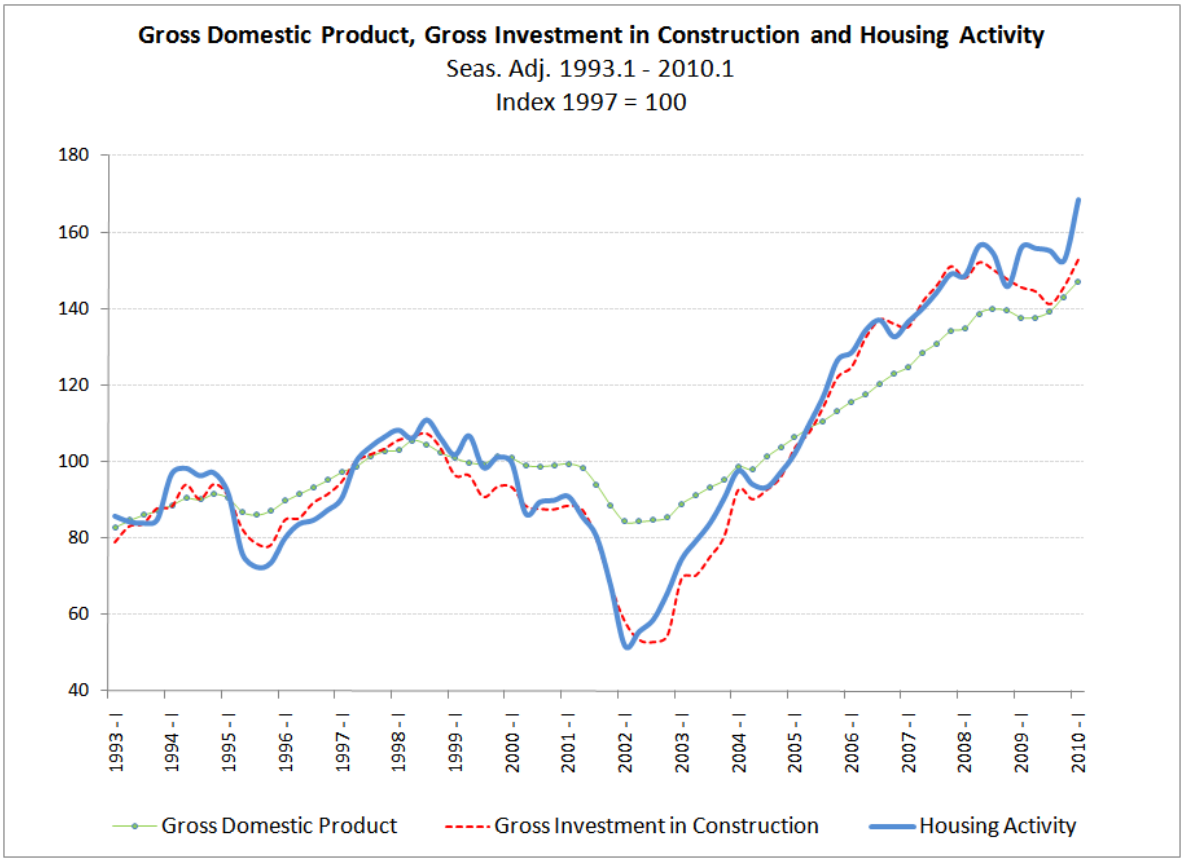
In the last three decades, the availability of housing in Argentina has not kept pace with demand. Two important factors explaining the persistence of the housing deficit and the declining quality of life in large urban centers are highly cyclical construction activity affected by macroeconomic disruptions and poor design of social housing policies.

This study analyzes the organization and main drivers of the housing market and relates them to the macroeconomic environment with the aim of advancing a policy agenda for housing policy reform. The study is presented in four sections. Section 2 describes the characteristics of the urban housing markets, including their evolution, the main participants, and the regulatory environment. Section 3 discusses demand behavior. Section 4 summarizes the operation of market forces, and Section 5 concludes the study and offers some policy recommendations.

2. Urban Housing Markets: Main Characteristics

Generally speaking, housing construction is a cyclical activity that replicates the fluctuations of the larger economy. Housing construction in Argentina conforms to this description, as it is characterized by peaks and troughs of activity influenced by disruptions stemming from significant macroeconomic crises. Figure 1 compares the evolution of GDP, public and private construction activity, and housing construction since 1993. A salient feature is the rapid growth of the sector following the 2001-02 crisis. (See Total Construction Business Cycle in Statistical Annex 1, Figure A1.)

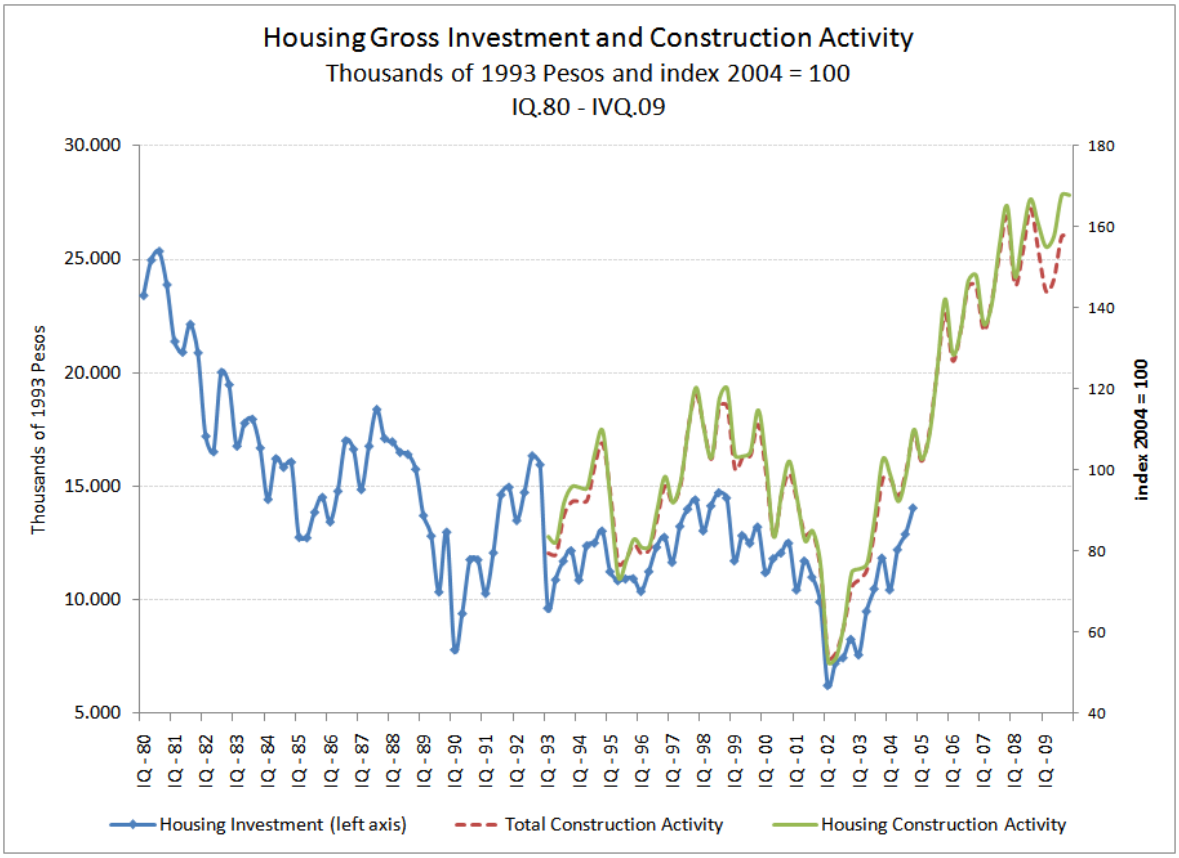
Figure 1. Gross Domestic Product, Gross Investment in Construction, and Housing Activity



Source: Authors' calculations based on INDEC (national statistical agency) figures.
Note: Construction aggregates shown here by the Gross Investment in Construction as provided by National Accounts estimates, comprise four main components: public construction, private construction (includes housing), industrial construction, and construction for petroleum activity. Unfortunately, separate estimates for housing construction are not available. One related indicator useful to follow housing construction evolution (Housing Activity in the chart) is the Synthetic Construction Indicator (ISAC).

Looking at investment in housing over a longer period (Figure 2) permits an appreciation of the 2003-2010 recovery of growth in housing construction: to find similar activity growth, one has to go back to the early 1980s. This suggests that housing construction has had a very important role in sustaining the growth path of the 2000s.

Figure 1. Housing Gross Investment and Construction Activity



Source: Authors' calculations based on National Accounts-MECON and ISAC. Housing investment corresponds to Fixed Gross Investment in Housing, Total construction activity and Housing construction activity corresponds to the ISAC

2.1 Overview of the Housing Situation in Urban Areas

According to population census data, between 1991 and 2001 the housing stock increased by 19.5 percent. Recent (provisional) data from the 2010 Census show a similar increase of 18.7 percent of total housing units in this period. This growth was characterized by a disproportionately large increase in houses compared to apartment units. Some 134,000 new houses and apartments were built annually. Official estimates have valued the housing stock as representing 35 percent of total capital stock on average in the last decade (see Tables 1 and 2).

Table 1. Housing and Households' Intercensal Evolution

Housing and Households Intercensal Evolution
1980- 2001

	1980	1991	2001		% 1980 - 1991	% 1991 - 2001
			Total	Urban		
Total Households 1/	7.572.374	8.927.289	10.075.814	9.099.596	17,9	12,9
Total Housing Stock	8.196.120	10.062.371	12.064.202	10.792.722	22,8	19,9
Total Occupied Houses 2/	6.798.317	7.743.545	9.204.711	8.425.970	13,9	18,9
Houses (type A)	n.d	4.727.279	6.048.671	5.623.533	n.d	28,0
Apartments	n.d	1.554.642	1.579.569	1.577.358	n.d	1,6
Houses and apartments	6.198.690	6.281.921	7.628.240	7.200.891	1,3	21,4
Precarious Recoverable	599.627	1.461.624	1.576.471	1.225.079	143,8	7,9
Precarious Not Recoverable	774.057	1.183.744	871.103	673.626	52,9	(26,4)

1/ For 1980 the number of households is estimated from the average size.
2/ Corresponds to precarious not recoverable.

Source: Own base on Population and Housing Census.

Table 2. Housing Stock Evolution, 1991-2001

Housing Stock Evolution
1991 - 2001

	1991		2001	
	Number	%	Number	%
Total Housing Stock	10.079.846		12.064.202	
Vacant houses 1/	1.187.011	11,8	1.719.480	14,3
Under Construction	131.107	11,0	191.906	11,2
For holiday or weekend uses	259.259	21,8	324.576	18,9
For rent or sale	85.718	7,2	314.980	18,3
Non-residential purposes	130.203	11,0	227.328	13,2
Closed, abandoned and unspecified	580.724	48,9	660.690	38,4
Closed for unknown reasons	(-)	(-)	331.654	19,3
Abandoned	(-)	(-)	276.487	16,1
Unspecified	(-)	(-)	52.549	3,1

1/ Includes dwellings not surveyed for reasons other than temporary absence of residents.

Source: Authors' calculations based on Population and Housing Census.

Housing conditions in urban cities vary according to location. Almost 40 percent of the quantitative housing deficit[1] is located in the province of Buenos Aires and 28 percent

[1] Quantitative and qualitative housing deficits follow the traditional measure in the region (Arriagada Luco, 2003). According to official estimates of 2003, the housing deficit was at about 3.5 million units, with larger concentrations in the poorest provinces. The size of the housing deficit differs according to alternative definitions of what is considered an "adequate house unit" to cover a household's shelter needs. These definitions have varied over time and across levels of government. Notwithstanding the definition and consequent size of the housing deficit, one of its characteristics in Argentina has been its persistence over

in the metropolitan area of Greater Buenos Aires (the capital city of Argentina and environs, including 24 municipalities). More than 53 percent of the overall deficit concentrates in the six largest cities (Greater Buenos Aires, Rosario, Santa Fe, Cordoba, Mendoza, and San Miguel de Tucuman).

The qualitative deficit is also a problem affecting more than 20 percent of households. Almost a quarter of this figure is due to overcrowding. The localities around the city of Buenos Aires and San Miguel of Tucuman have the highest incidence of overcrowding (20 percent). The city of Buenos Aires (the inner city of the largest metropolitan area in the country) has the lowest incidence, with a 7 percent qualitative deficit.

Tenancy has also changed over time (see Table 3). Renting a house was a diminishing characteristic of the housing urban market until very recently, when supply for rental dwellings increased noticeably, at least in Greater Buenos Aires (See Figure 3).

Table 3. Housing and Households Intercensal Evolution by Type of Tenure, 1960-2001

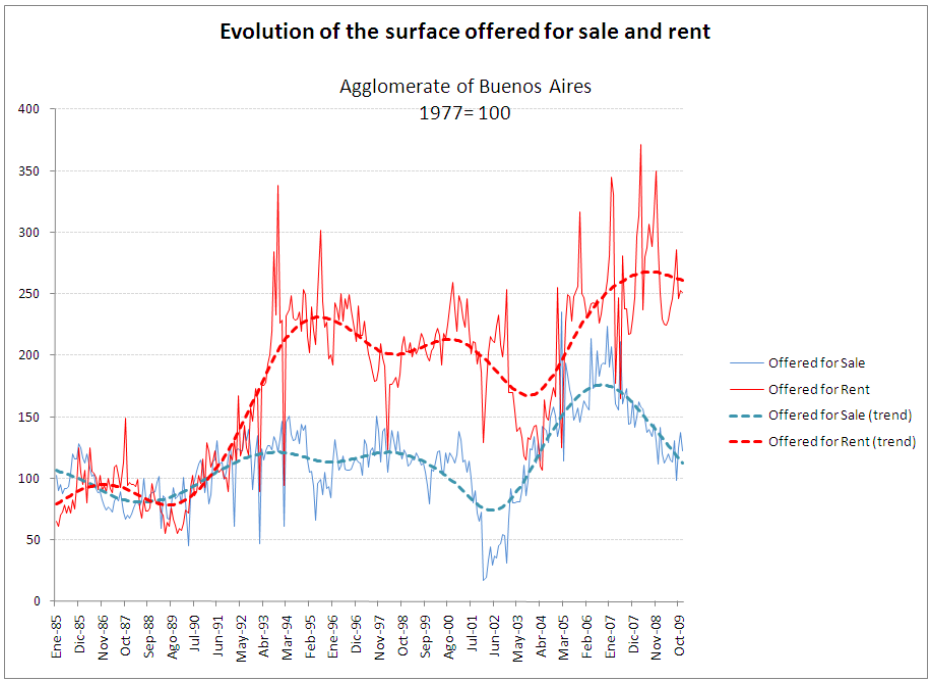
Housing and Households Intercensal Evolution
By type of tenure
1960 - 2001

Type of tenure	Apartments and houses			annual growth rate (%)	
	1960	1991(**)	2001(**)	1991/1960	2001 / 1991
Owner	2.243.657	4.506.303	5.858.625	2,35	2,66
Tenant	1.086.633	827.291	930.407	-0,90	1,18
Other Occupancy arrangements (formal)	166.275	615.831	629.517	4,46	0,22
Other	230.823	332.496	209.691	1,22	-4,51
Total	**3.727.388**	**6.281.921**	**7.628.240**	**1,76**	**1,96**
		As % of total		*Absolut Change %*	
Owner	60,19	71,73	76,80	11,54	5,07
Tenant	29,15	13,17	12,20	-15,98	-0,97
Other Occupancy arrangements (formal)	4,46	9,80	8,25	5,34	-1,55
Other	6,19	5,29	2,75	-0,90	-2,54
Total	**100**	**100**	**100**	-	-

(**) The tenure type was estimated from the distribution of households
Source: Own base on Population and Housing Census.

time. Even though the country growth rate evolved favorable during the mid-1980s and most of the 1990s, the housing deficit continued to be an unsolved problem. This was partly due to poor social housing programs and partly to lack of development in financial instruments devoted to housing finance.

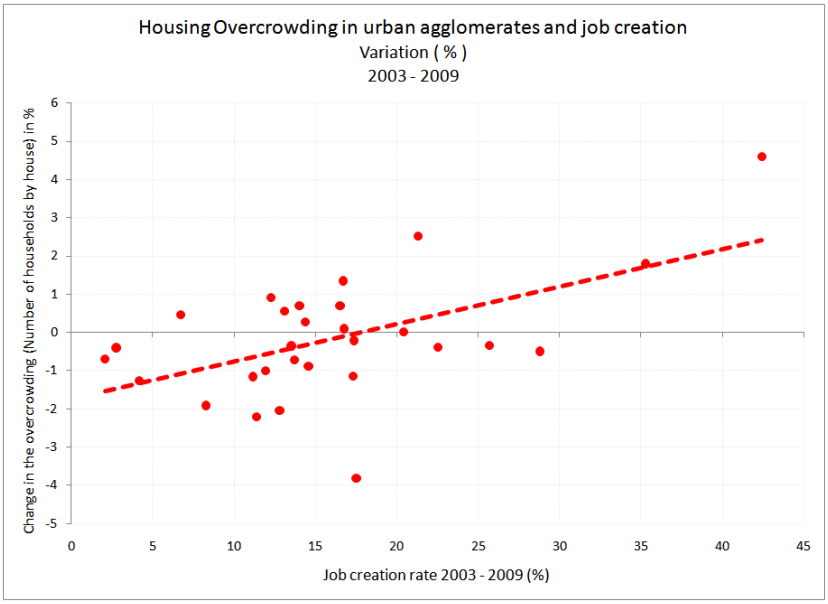
Figure 2. Evolution of the Surface (Area) Offered for Sale and Rent



Source: Economic Trends.

In recent years, households have been moving to urban areas where the most jobs were being created. Since housing supply has not responded at the same pace, internal migrations have resulted in increased housing overcrowding (see Figure 4). Moreover, correlations of housing deficit, both quantitative and qualitative, are positive and significant with respect to population density (0.40 to 0.66 depending on the definition of deficit), employment density (0.3 to 0.51), and poverty (0.73 to 0.77) in urban centers. Between 2007 and mid-2010, estimates based on the Permanent Household Survey confirm a rapid increase in the construction of detached houses (around 416,000 houses) and apartments (258,000 new units). At the lower extreme of the market, old houses became irrecoverable (113,400) and overcrowding grew in around 75,000 housing units.

Figure 3. Housing Overcrowding in Urban Agglomerates and Job Creation



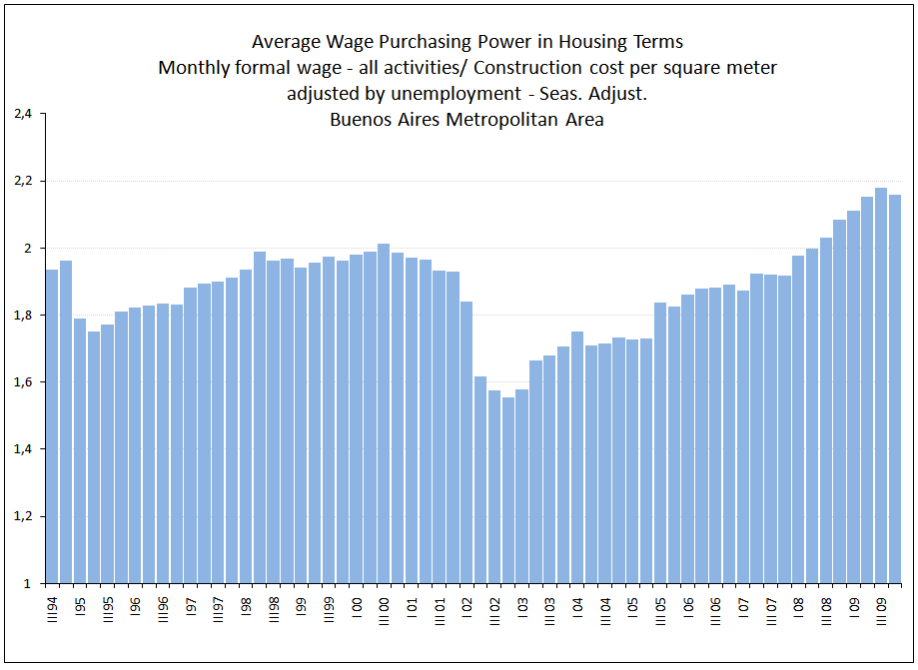
Source: Authors' calculations based on EPH.

Affordability analysis: A housing affordability index is calculated as the housing cost-to-income ratio. The conventional indicator takes into consideration the averaged variables and studies the evolution over time or across locations. Alternatively, the affordability index may also introduce the idea of accessibility to a mortgage loan, as in the case of the US-National Association of Realtors index. This index measures whether a typical family with a median income could qualify for a mortgage loan on a typical house.

In this sub-section we analyze the evolution of housing affordability for Argentina using alternative indices based on construction costs and housing market prices per square meter. The affordability index will allow us to illustrate two main issues. From the macroeconomic point of view, the 2001-02 crisis caused a disruption in the economic regime, deeply affecting relative prices. The mega-devaluation of the peso translated into the increase of prices for tradables relative to non-tradables. In the case of housing costs, prices are composed of tradable and non-tradable goods where the latter exhibit the largest participation. For instance, in the case of the Housing Construction Cost Index (INDEC), component weights are the following: labor, 45.6 percent; construction materials, 46 percent; and other expenses, 8.4 percent. The latter two components are indices made of

tradable and mostly non-tradable goods.[2] Family income is often represented through salary, the "price" of labor, a core non-tradable of the economy. As a consequence of the crisis, GDP fell 14 percent between 2001 and 2002. Around 2007, per capita GDP recovered in real terms, reaching a value similar to the one reported in 1998. Thus, for almost a decade, the average Argentine household was poorer than in the period 1993-98, which is being used as a reference. Accordingly, the affordability index, defined as the ratio between housing construction costs and salaries, fell sharply after the crisis and began to recover towards the end of the decade. Moreover, an increase in employment, particularly in formal occupations, determined an increase of total household income, which also impacted affordability positively. Figure 5 illustrates this point.

Figure 4. Average Wage Purchasing Power in Housing Terms



Source: Authors' calculations based on INDEC and IERIC data.

The wage correction produced by the unemployment rate is a rough representation of the impact of changes in total household income. However, this measure of affordability does not include the cost of land. Prices of land plots are highly variable across the country and from one neighborhood to the next. In this sense, this affordability index should be

[2] Increases in construction costs between IV01 and IV09 were as follows: overall index, 282 percent; materials, 272 percent; labor, 302 percent; and general expenses, 226 percent.

considered a “frictionless measure,” without transport-saving costs and other benefits from amenities included in the price of the land.

At the microeconomic level, dispersion of housing prices due to quality and location of units and the gap between price and cost as recorded by private sources (realtors) suggest the segmentation of the market under current conditions. Due to the lack of a well-developed mortgage market, middle-income households participate in the housing market only spasmodically, depending on their availability of savings. Instead, investors (domestic and foreign) and high-income households are active at the upper end of the housing market, demanding expensive units. At the other end, social housing policy has kept a flow of new units serving the poor families at a pace of 35,000-50,000 units per year.

The comparison of housing markets in the 1990s and 2000s is relevant. During the 1990s, housing construction proceeded at a good pace, and the mortgage loan market was broadened to reach middle-income families. The mix of highly imperfect housing price indices provided by private sources showed prices per square meter in dollars relatively lower than the ones prevailing in the 2000s, when those indices mainly reflected unit prices of expensive housing. Thus, any affordability index based on those prices presents a distorted picture of the market.

The use of housing construction costs as the numerator of the affordability index also presents problems. Housing construction costs can be divided into two categories of construction—detached houses and apartments—both of good quality. Thus, comparison over time is fair, but the calculation is biased toward underestimation of affordability by the average family. Additionally, sources for statistics on wages also differ due to coverage, definition of labor formality, and changes in composition effects. An example of the variability of results according to the components of the index used in the calculations can be seen in Table 4.

Table 4. Average Purchasing Power of Wages in Housing Terms

Average Purchasing Power of Wages in Housing Terms
Monthly wage / Construction cost by square meter
Buenos Aires Metropolitan Area
(Sq. Meters that can be bought with one´s salary per month)

	Detached House			Multifamily Dwelling		
	1993 - 1998	2003 - 2009	% Change	1993 - 1998	2003 - 2009	% Change
Formal sector wages - all activities 1/ (*)	2,24	2,12	(5,27)	2,14	1,87	(12,76)
Formal sector wages - all activities - 1/ 2/ (*)	1,88	1,87	(0,18)	1,80	1,65	(8,05)
Formal sector wages - all activities 3/	2,05	1,57	(23,60)	1,97	1,38	(29,67)
Formal sector wages - all activities - 3/ 2/	1,75	1,38	(20,94)	1,67	1,22	(27,20)
Informal sector wages - all activities 3/	1,28	0,70	(45,12)	1,23	0,62	(49,46)

(*) Available from third quarter 1994.
1/Formal wages as registered by the Nationa Pension Fund System (SIJyP)
2/ Corrected by unemployment
3/ Formal wages as registered by the Permanent Household Survey (EPH)

Source: Authors' calculations based on INDEC.

The most important difference to bear in mind for our analysis is formal vs. informal wages, pointing once again to the potential segmentation of the market in terms of access to loans and repayment capacity over time.

2.2 Housing in Selected Urban Metropolitan Areas

Presently, 47 percent of the Argentine population lives in only seven large cities (metropolitan regions). Four of them are located near the Atlantic coast and exhibit the potential to become an urban continuum (a megalopolis). Buenos Aires and its suburbs (Buenos Aires Metropolitan Region) is a megacity with more than 13 million inhabitants, ranked as the 15th largest city in the world.[3] Table 5 shows the relative importance of the selected cities.

[3] Population as of 2010.

Table 5. Evolution of Urban Areas in Argentina

Evolution of the urban areas in Argentina

Urban Agglomerate	Population in the agglomerate (as % of Total Population)					Population in 2001 (thousand of hab.)	Population density hab/km^{2} (*)	Population Growth 1991 - 2001 (%)	Urbanization rate 1/
	1960	1970	1980	1991	2001				
Great Buenos Aires	33,7	35,8	34,9	33,5	31,6	11.460,6	5.128,7	4,8	0,89
Great Santa Fe	1,2	1,2	1,2	1,2	1,3	454,2	160,2	11,5	1,05
Great Rosario	3,3	3,5	3,4	3,4	3,2	1.159,0	546,2	3,8	0,92
Great Mendoza	1,7	2,0	2,1	2,4	2,3	846,9	1.229,2	9,8	1,59
Great Tucumán	1,5	1,6	1,8	1,9	2,0	736,0	4.236,7	18,7	1,55
Great Córdoba	3,0	3,4	3,5	3,7	3,8	1.368,1	2.122,2	11,3	1,42
Subtotal	44,3	47,5	47,0	46,2	44,2	16.024,8	(-)	6,3	(-)
Total Urban	73,8	79,0	83,0	87,2	89,4	32.374,0	(-)	13,8	(-)
Total Country	100	100	100	100	100	36.228,6	(-)	11,1	(-)

Notes:
(*) Corresponds to the weighted average density of the departments over which extends the agglomerate
1/ Urban agglomerate growth rate and total growth population rate ratio.

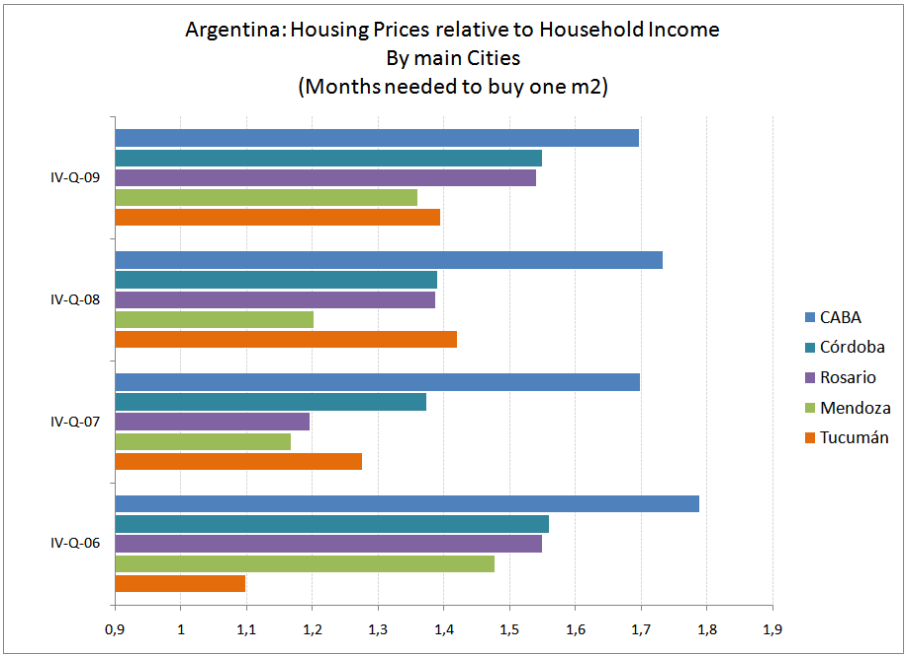
Rates of both ownership and slum incidence are higher in larger cities. Being a developing country, Argentina's migration and demographic evolution have affected urban housing market dynamics over time. Episodically, economic swings and changes in preference for location have determined significant changes in household location that left their imprint on local urban development (slum growth during the 2002 crisis, apartment building construction in the 1970s and, more recently, the creation of new neighborhoods: gated communities on the outskirts of large cities in the 1990s and Puerto Madero in the city of Buenos Aires in the 2000s). Consequently, housing market conditions vary across cities.

Construction costs do not differ much across localities. The variation is mainly a function of differences in regional salaries. But prices per square meter are quite diverse depending on demand. Larger cities tend to exhibit higher prices for dwellings with similar characteristics than smaller cities in the interior of the country. The main reason is that the former concentrate many factors of attraction (employment, amenities, etc.) but have less space available at convenient distances from the city center. Episodes of rapid migration or shifts in demand located in specific neighborhoods of larger cities provoked an increase in land prices. This is true recently of Buenos Aires and, very likely, of Rosario.

In the 2000s, average prices per square meter in the city of Buenos Aires were double those of Tucuman and Mendoza. Prices in Tucuman and Mendoza, in turn, were double the prices registered in smaller cities such as Jujuy or Trelew. The ratio of new to old apartment prices also widens when the size of cities declines.

As a consequence of differing prices by constructed square meter and variations in average income by regions, *affordability* also changes across cities. Data for 2000 suggest that affordability diminishes with urban agglomerate size. Figure 6 shows affordability measured in terms of the number of monthly salaries needed to buy one square meter of housing in the five largest cities of Argentina. The amount ranges between 1.1 to 1.8 months. A household living in the city of Buenos Aires will need to work 60 percent more time than one in Tucuman to acquire a similar dwelling. These differences are larger when smaller cities are considered. In the case of cities with less than 800,000 inhabitants, market reports indicate that this affordability measure is 30 to 40 percent lower, i.e., the effort required to purchase one square meter of housing is lower than one monthly salary.

Figure 5. Housing Prices Relative to Household Income



Source: Authors' calculations based on IERIC.
Note: CABA stands for Ciudad Autónoma de Buenos Aires.

With respect to the heterogeneity of household characteristics across the country, differences in per capita income, family size, education of the household head, age of members, and other factors affect the preferences and accordingly the demand for shelter.

2.3 Characterizing the Actors of the Urban Housing Market

2.3.1 Housing Informality

According to the World Bank (2005), the historically high share of homeownership has also been made possible by a fairly good system of land and cadastral registration. Ninety percent of properties in Greater Buenos Aires have full registration title (even though some of them are illegally occupied). Still, some 1.6 million households in the country (15.9 percent of all households) do not have proper legal titles. This includes *asentamientos*, *villas*, occupiers of private land in irregular subdivisions, and occupiers of undivided rural lands.

Illegally occupied land is often located in flood-prone or contaminated areas and lacks basic infrastructure. There is ample evidence that the absence of proper titling hinders families from investing more in their housing, prevents prospective buyers from obtaining mortgage credit for purchasing non-titled houses, suppresses the value of houses, and inhibits the development of a proper housing market (e.g., Galiani and Schargrodsky, 2004 and 2010).

In order to study the evolution and main characteristics of informality, we prepared a database using several sources, including the census, EPH, ENGH, and the Living Conditions Survey, covering only partially over time and in scope the required aspects of informality. These characteristics are tabulated in Table 6 and Table A4 to Table A12 in Annex 1.

Table 6 presents four alternative definitions of informality and the percentages of formal tenancy along with the incidence of slums by income decile. As shown, informality is not a dominant problem in Argentina. Slums are located in the periphery of large cities.

Table 6. Tenure Categories by Income Decile

Tenure Categories (*) by Income Decile. 1/
Percentage of total households

	Formal 1	Formal 2	Formal 3	Formal 4
1	69,5%	69,4%	59,5%	68,4%
2	75,7%	75,6%	68,4%	75,4%
3	81,0%	80,9%	76,9%	80,2%
4	82,2%	81,9%	79,5%	81,1%
5	84,0%	84,0%	82,5%	84,0%
6	87,6%	87,6%	87,0%	87,4%
7	87,4%	87,0%	85,8%	86,9%
8	86,7%	86,7%	86,7%	86,7%
9	89,8%	89,7%	90,2%	89,7%
10	93,2%	93,2%	92,7%	93,2%
Total	83,7%	83,6%	80,9%	83,3%

1/ Total household income per capita.

(*) Categories corresponds to:

Formal 1

1 = Owner of the house and the plot or renters

0 = Owner of the house and not of the plot and legal and ilegal tenants

Formal 2

1 = Owner of the house and the plot or renters, not located in slums
0 = Owner of the house and the plot located in slums and Owner of the house and not of the plot and legal and ilegal tenants

Formal 3

1 = Owner of the house and the plot or renters with plumbing facilities and sewarage
0 = Owner of the house and the plot or renters but without plumbing facilities nor sewarage, owner of the house only

Formal 4

1 = Owner of the house and the plot or renter, excluded households located in slums

0 = Owner of the house and the plot or renters and other legal and ilegal tenants located in slums

Source: Own based on Permanent Household Survey. 2009.

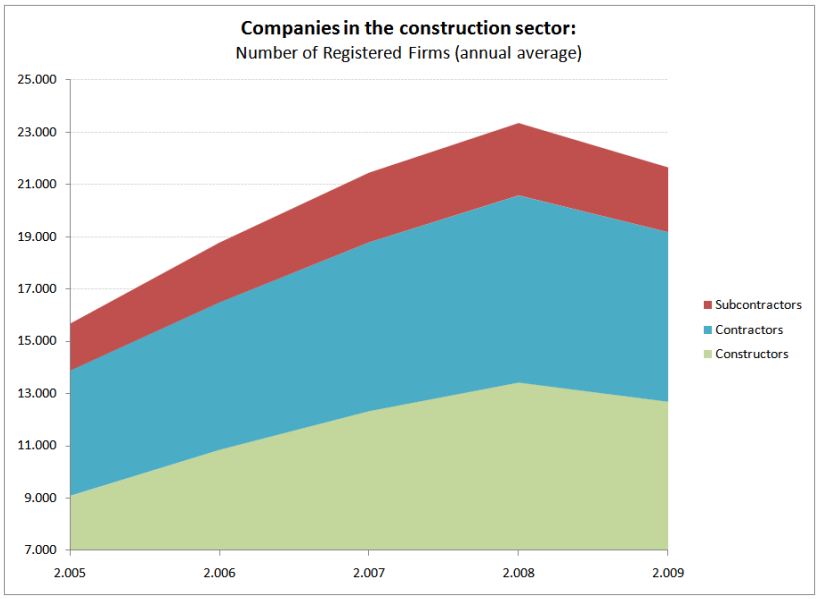
2.3.2 Construction Companies and Developers—Productivity and Profitability

The construction sector in Argentina comprises a variety of firms of different sizes and technologies ranging from family enterprises and small builders—highly skilled and less skilled ones—to larger and more sophisticated companies. The small units still dominate the sector in terms of number of companies, working in their own projects, providing services for larger companies or contracting their services to households building their homes. More recently, a handful of high-tech expensive dwelling developers have been very active in the market, particularly in the construction of suburban neighborhoods. They have also developed neighborhoods for foreign and local investors in selected locations in Buenos Aires, Rosario, and Córdoba.

There were around 17,500 formal companies in activity in June 2010. The value chain is composed of approximately 10,500 construction companies, 5,000 contractors and 2,000 subcontractors. Sixty percent of them are active in provinces with the largest urban centers (Buenos Aires, Córdoba, and Santa Fe). The sector has expanded over time (see Figure 7). Small companies dominate activity, represent 75 percent of firms and employing 20 percent of the workforce (3 workers per company). On the other extreme, 2 percent of the companies are large ones, with more than 100 workers, and they employ around 30 percent of the total. In the middle, 22 percent of the companies are medium ones between 10 and 100 workers, explaining half of employment. The activity is labor intensive ,and labor informality used to be very high. In recent years, the degree of formality has increased along with employment in the sector (see Figure 8).

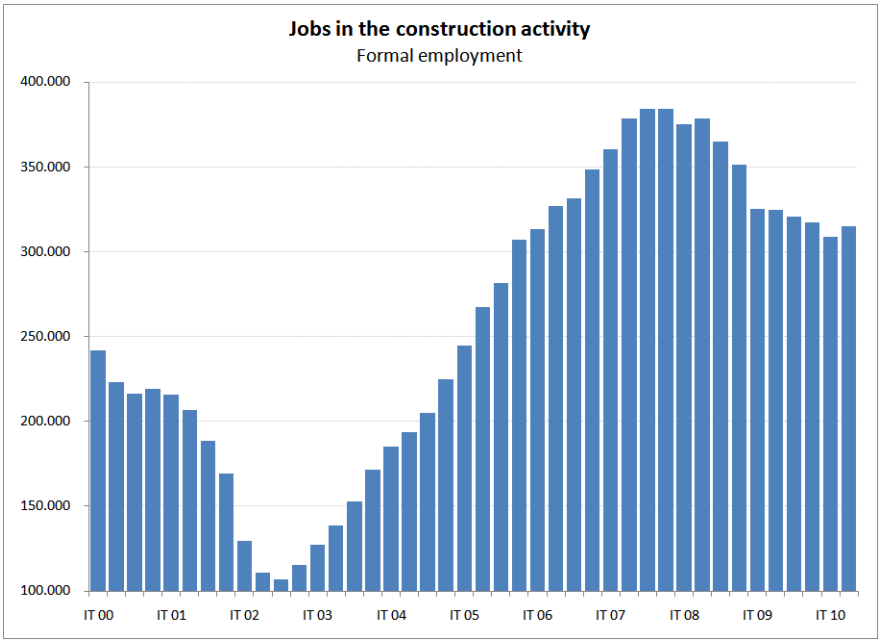
Their activities also include other types of construction, from public infrastructure to housing. Large companies mostly concentrate on public infrastructure or commercial construction. Smaller companies and a number of developers specialize in apartment buildings or suburban gated communities. Detached houses are built by independent builders (architects, civil engineers, etc).

Figure 7. Companies in the Construction Sector



Note: Small companies renew their inscription in the Construction Register annually, so that quantity of participants is variable but on average has been increasing over time.

Figure 6. Jobs in the Construction Activity

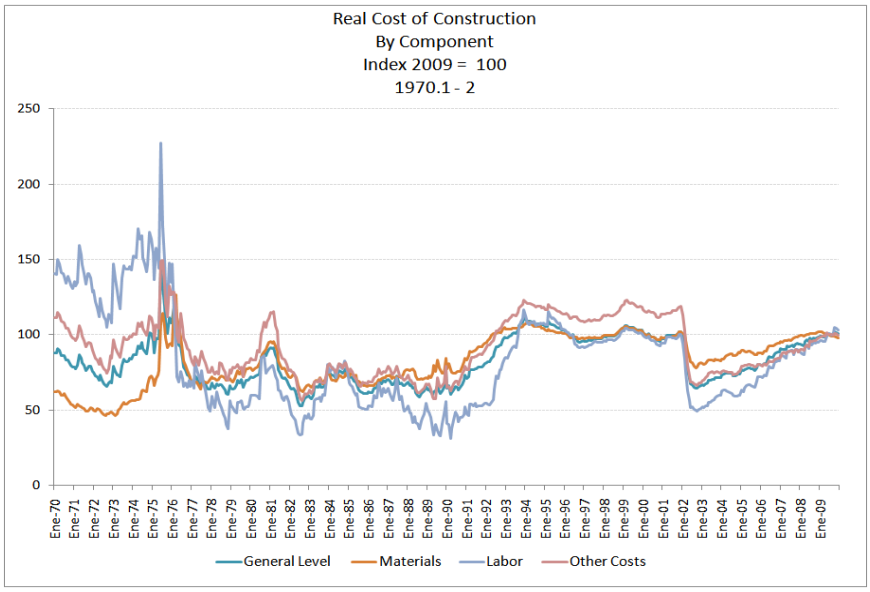


Source: Authors' calculations based on IERIC.

Construction costs keep their relative position related to wholesale prices (tradables) in the long run.[4] Consisting mostly of a basket of non-tradable inputs, they were relatively high in the 1990s and adjusted in the early 2000s. Recently, they are recovering relatively in a scenario of increasing prices (the consumer price index rose by 25 to 30 percent in 2010) (See Figure 9). Returns to construction vary by region but have been growing very fast in the city of Buenos Aires, followed by Rosario and Cordoba as shown in Figure 10 through the ratio of the price of new apartments by square meters in Buenos Aires to the cost of construction.

[4] Housing in Argentina reflects the Italian and Spanish ethnic backgrounds of the population. Except for marginal rural dwellings and urban shantytowns, concrete, mortar, and brick are the main construction materials.

Figure 7. Real Cost of Construction



Source: Authors' calculations based on INDEC data.

Construction activity increased heavily in the 2000s when the number of permits grew from 50,000 to more than 90,000 per year and area constructed went from 6 million to more than 10 million square meters for new housing. On top of this, another 20 percent of built area was added due to the expansion of existing dwellings.

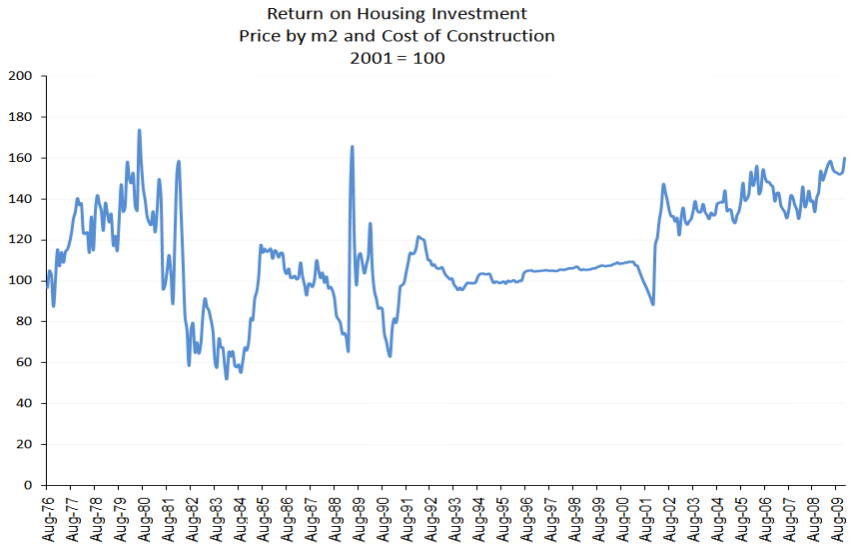
Previous studies and our own description of the construction sector have identified only a few constraints to the efficiency of construction companies. Instead, due to the lack of a fluid mortgage market, financing of new construction has traditionally been linked to the evolution of financial alternative assets and to the development of financial instruments such as the *fideicomiso*.

In 2004, private analysts estimated that housing production in Argentina averaged 215,000 units per year; 53,000 (40 percent) were produced by the informal sector without permit or license (self-help housing construction or informal builders); 40,000 (18 percent) were produced by the public sector; 74,000 were detached houses produced by the formal sector (34 percent); and 48,000 were formally constructed dwelling units (22 percent). In recent years, these figures increased due mainly to the contribution of the formal sector.

Housing supply appears to be neither bound by construction input constraints nor heavily influenced by land availability. However, spatial differences are of interest and land

availability in highly dense urban areas (Greater Buenos Aires, Greater Rosario and Greater Córdoba) is an issue under discussion.

Figure 8. Return on Housing Investment



Source: Authors' calculations based on Toribio Achaval and IERIC.

2.3.3 Urban Dynamics and the Housing Market

Cities in developing countries are growing at extraordinary rates. However, in Argentina, rapid urbanization took place in the 1940s and 1950s, crowding cities that had been founded in the early 1800s and had developed in the early 1900s, when large-scale investments in urban infrastructure (roads, public transport, public buildings, energy, sanitation, telephones, hospitals, and schools) were made. To a great extent, the most important cities in the country still depend on those investments, which were excessive at the time of their first expansion and now remain at the core of an extended (and sometimes overcrowded) system. In contrast, investment in housing proceeded spasmodically in accordance with factors such as income growth, business cycles, low-income housing programs, and migration.

The rate and character of urban expansion has rarely been taken into consideration when designing public policy in Argentina, and urban growth has not proceeded in an orderly manner. Thus, large Argentine cities are mature structures where many effects of urban dynamics are present. This sub-section focuses on two of them: filtering and

gentrification. These two effects should be taken into account when designing housing policy. Filtering may reduce the need for low-income housing, while gentrification may increase it in certain locations.

Ratcliff (1945) defines filtering down as the process by which the production of new housing for higher-income groups releases used houses to be passed down to segments of the population with successively lower levels of income until the effect has reached the bottom of the market. These changes in occupancy are accompanied by a decline in market prices (sales price or rent value). As a consequence, sub-standard houses tend to be removed from the housing stock. Skaburskis (2006) adds that the filtering mechanism should convey a reduction in rents or sale prices of used units below the economic cost of similar new ones or their modification.[5] Gentrification is the process by which demand for housing increases in inner or central cities, bidding up the value of the land under aging buildings to make room for renovation and replacement.

Both effects have income redistribution consequences. In this regard, the city of Buenos Aires probably represents the most extreme situation. As the inner city of the largest urban agglomeration, it has been subject to various effects of urban dynamics.

During the 1990s, the city lost population that moved to gated communities in suburban areas (sprawl). This may have allowed a "filtering down" process, difficult to identify due to other changes in the housing market that promote the expansion of demand to new, previously constrained consumers. The mortgage market deepened and the city of Buenos Aires was one of the first served. In contrast, the 2000s witnessed the opposite movement, with households coming back to the city producing a sort of mild gentrification and pushing densification in low-cost residential neighborhoods adjacent to traditionally more costly ones (in 2001-2010, the population grew 4 percent, compensating for two-thirds of the previous emigration).

A comparison of the evolution of construction costs and final prices of new buildings per square meter suggests that land prices skyrocketed in this city in the 2000s.

[5] Some authors distinguish between neutral and "welfare-improving" filtering, where the latter improves the well-being of low income households. (Baer and Williamson, 1988). It is also usually assumed that the occupancy of housing by successively lower income groups is concomitant with deterioration in the quality of the accommodations. This relationship obtains in a general way, but filtering could take place without any significant change in quality, and the rate of filtering is not proportionate to the rate of deterioration. Decline in quality resulting from physical change, obsolescence, and a degeneration of the environment is only one of several factors that conditions filtering.

Various factors produced this result: demand from real estate investors (domestic and foreign), rapid income growth in the upper end of the income scale (income concentration), and return of households that had participated in the urban sprawl of the 1990s (for security and transport cost reasons).

Concerning the filtering process over time, we have explored the response of the relative price between new and old apartments in the city of Buenos Aires, correlating it with activity level, housing construction, income concentration (Gini), and rental housing. In all cases the results have shown the expected (positive) sign, and correlations were significant and high. The following figures show the evolution of the price ratio and the correlation results.

Figure 9. Prices: New/Old Apartments Ratio

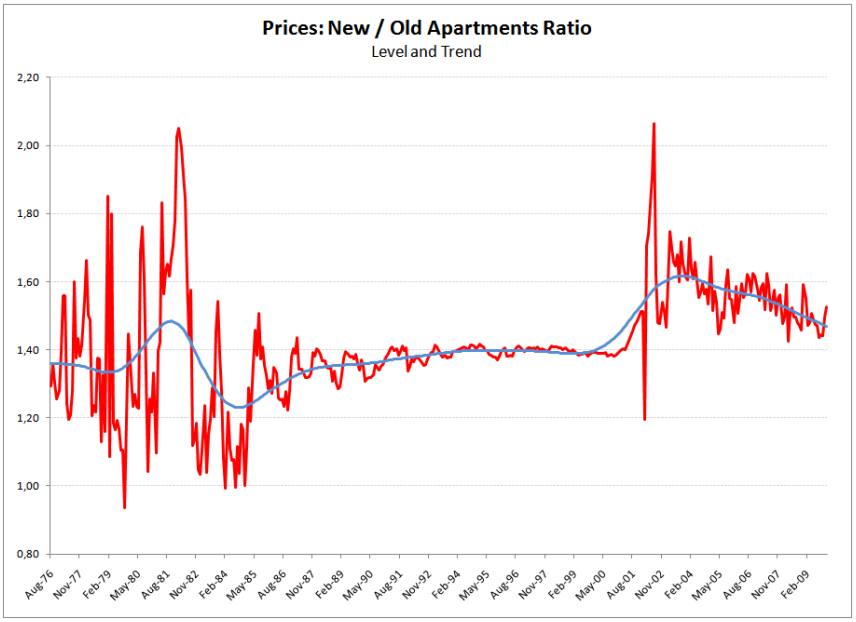
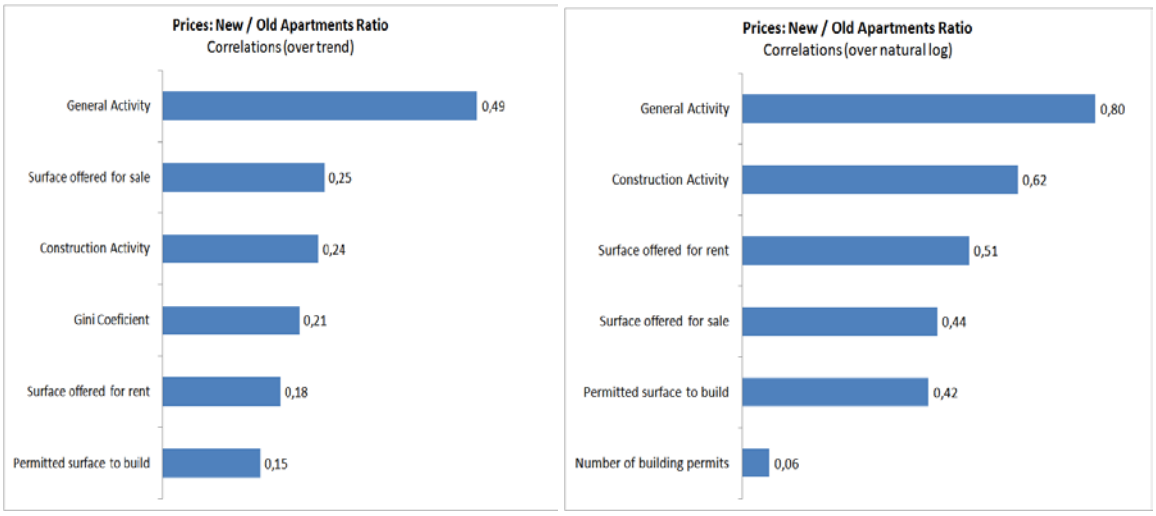


Figure 10. **Figure 11.**



Source: Authors' calculations based on market information and official figures.

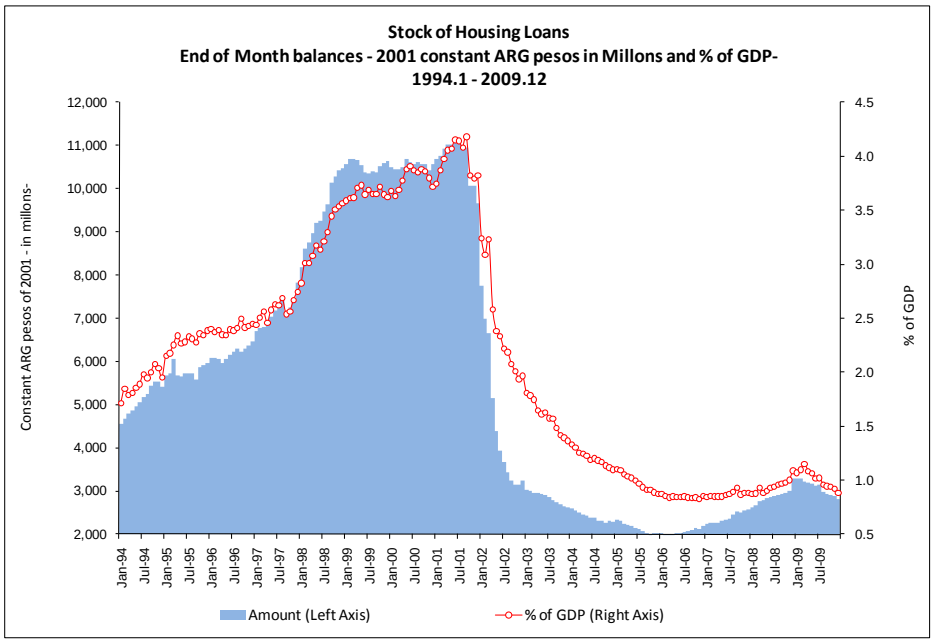
A second piece of information is amortization rates implicit in apartment sales. According to León (2010), these rates vary between 0.2 and 0.7 percent annually, with an average of 0.4, which translates in an imputed age over one hundred years for those dwellings. This suggests a positive excess demand operating in this urban space in 2009, causing a higher valuation of buildings notwithstanding of their age.

2.3.4. Financial Markets—Recent Evolution, Mortgage Contracts, Informal Financing, and Accessibility

The Argentine financial market has not fully recovered from the 2001-02 crisis. The mortgage loan market suffered a disruption due to freezing of evictions and renegotiation of contracts. Currently, private banks provide financing to clients at the upper end of the market, while public banks offer mortgages for middle-income households under more convenient access conditions in accordance with government guidelines. Credit lines are limited by each bank's available funding. The scarcity of mortgage loans partly explains the likelihood of access to home ownership.[6] Figure 14 presents the dramatic evolution of the mortgage loan market after the 2001-02 crisis.

[6] Anastasi et al. (2006) studied the availability and uses of financial services across localities in Argentina. They found that state-owned banks have more branches than private banks. Foreign banks tend to be located in major urban centers, while and domestic private entities show greater relative response to the business environment at the provincial level. Their econometric analysis shows a link between the level of banking activity and poverty. One of the main elements conditioning the degree of availability of banking services is the number of inhabitants: Ninety percent of localities with fewer than 2,000 people have no banking services.

Figure 12. Stock of Housing Loans



Source: Authors' calculations based on Central Bank data.

Housing became less accessible in Argentina after the 2001 crisis. The minimum income needed to qualify for a mortgage more than tripled in one year, while the average income level of Argentine households declined. Average households were no longer able to afford a mortgage. At the same time, housing prices recovered over time after a deep fall in dollar terms due to the mega-devaluation. In 2004 and 2005, the average monthly payment to cover a mortgage loan of AR$ 40,000 was AR$600. Banks required that monthly payments be equal or less than 30 percent of household income. Only the first two deciles of household income distribution were able to comply with that requirement. The situation has worsened since the crisis due to inflation and the prohibition against loan indexing. Interest rates around 19 percent in nominal terms (they tend to be negative when compared to annual wage increases) and loan maturities around 12-15 years determine initial repayment rates that exceed the capacity of middle-income households, making it nearly impossible for them to access a mortgage.

This percentage falls to 5 percent in localities with a population exceeding 25,000 inhabitants. At the provincial level, more than 70 percent of loans and deposits are concentrated in the city of Buenos Aires and the province of Buenos Aires. This concentration is partly explained by differences in the efficacy of loan recovery in the judicial system (Cristini et al., 2002).

2.3.5 Government: Construction Standards, Residential Regulations, and Social Housing Policies

Construction standards and residential regulations have been regarded in the literature on urban development as a source of cost overruns for construction and as a barrier for access to housing. In Argentina, Goytia et al. (2010) provide evidence on the relationship between land regulation and the (formal/informal) residential tenure condition of households. These authors collected a nationwide survey of local land use regulation from planning professionals, covering the municipalities in the large urban agglomerations of Argentina. A set of indicators were then created, allowing an analysis of the regulatory environment with respect to some of the main issues (e.g., existence of land use plans, authorities involved in zoning changes and residential projects approval processes, existence of building restrictions, infrastructure, access to land regulatory elements, and the cost of project approvals). Then, using data from the National Households Survey (2007) and the last available National Census (2001), they estimated the effect of land regulation on household formal/informal tenure. They found that those municipalities that had incorporated more land planning regulatory measures into their legal and regulatory frameworks also faced the cost of larger informal land sectors. They also found negative effects on formality for higher residential approval costs and tighter regulation (in the form of more authorities involved in authorization).

Social housing policy analysis has been developed at length in Argentina due to the early inception of housing policy (the National Mortgage Bank was founded in 1882), the historically broad scope of the housing program (FO.NA.VI) and to the unsatisfactory results over time. Briefly, social housing policies have been organized through the National Housing Fund (FO.NA.VI). This fund was the most important housing program since the mid-1970s. After more than 30 years in operation, FO.NA.VI (now structured under the umbrella of the National Housing System and its scope reduced because of the establishment of Federal Housing Plans in 2004) was characterized by important inefficiencies that were never resolved. Among these were high administrative costs to manage housing program delivery (an average of 14 percent of total disposable funds in the early 2000s). The main type of service it provided was to directly provide houses and their respective financing through highly subsidized mortgage loans. The construction process

was lengthy, generating high carrying cost and making the process sensitive to unanticipated rises in construction costs and to potential inflation.

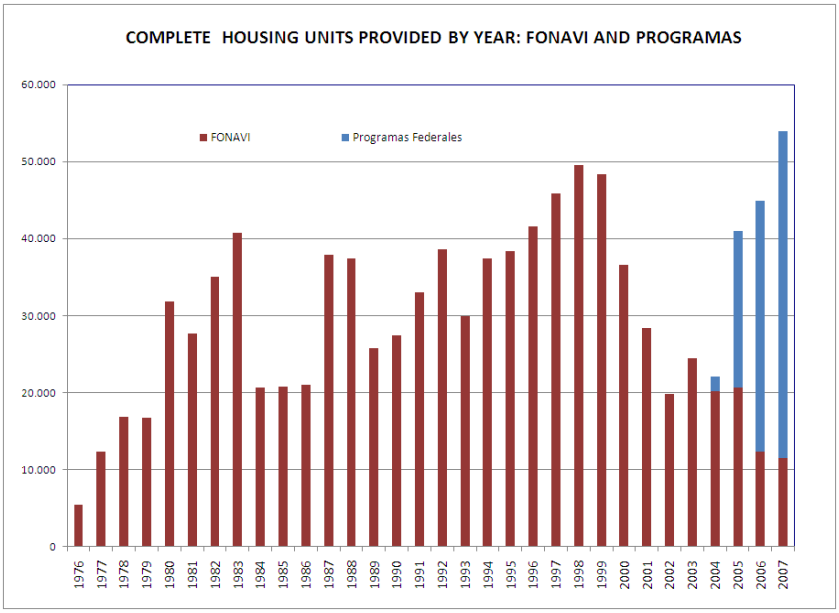
Program delivery conveyed heavy implicit subsidies. In the late 1990s, financing was provided at concessional conditions: repayment of loans involved between 21 and 26 years, fixed interest rates were well below market standards—between 0 and 6 percent depending of the type of program—and the loan recovery rate was very low, averaging between 35 and 36 percent. Altogether, this translated into a de facto subsidization rate of 80 percent of the value of the house, including debt forbearances. This figure does not include the subsidies embedded in the provision of land at concessional prices by the local governments.

The beneficiaries of the system were not among the poorest households since no income ceiling was set, although a minimum income was required. The population served was at actually middle-income. Although most provinces use a scoring system based on socio-economic criteria, lottery and allegedly political interference played a significant role in the selection of beneficiaries.

Our previous work has also shown that at the local level there are several factors probably related to poor regional institutions that worsen poverty conditions, including housing. At the same time, there has been a steady trend toward decentralization of households to mid-size cities of around 500,000 to 1,000,000 in population. Unfortunately, Argentine housing programs have not kept up with this trend. Organized under a supply-oriented scheme, they prevent households from moving in search of better institutional or labor conditions, reducing flexibility and risking more severe problems, such as increasing structural poverty.

Sustained fiscal efforts to close the housing deficit have not exceeded 0.5 percent of GDP in Argentina's recent history, and given other short-term priorities, this is a difficult objective to meet. The new programs (Federal Housing Plan) have combined the provision of social housing with jobs programs in order to create jobs directly and indirectly through public housing investment. Spatial distribution of the benefits has been biased by political factors. (see Cristini, 2004 and Cristini and Iaryczower, 1997). Moya et al. (2010) confirm the previous assessment of FO.NA.VI and add information on the operation of the Federal Housing Plan. Figure 15 shows the evolution of housing units under these programs.

Figure 13. Complete Housing Units Provided by Year: FO.NA.VI and Programas



Source: Authors' compilation based on MOSP.

3. Determinants of Housing Demand and Tenure Choice

Housing demand is a complex concept. It may refer to housing services stemming from a group of housing attributes or to the individual housing attributes themselves. It can be considered narrowly, i.e., the building and facilities in it, or more broadly, taking neighborhood characteristics into account. Finally, it may involve not only the use but also the type of tenure (ownership or rental).

In this section we will discuss two aspects of housing demand relevant for our case. First, we will estimate a demand for housing services including neighborhood characteristics. Secondly, we will study the determinants of the household's tenure choices.

Calculating the demand for housing services will enable us to estimate price and income elasticities and compare them with international and regional results. The analysis of tenure choice will complement our description of the key variables driving the housing market.

3.1 Estimation of a Demand Equation

Following Fontela and Gonzalez (2008), Zabel (2004), and Malpezzi (2002), we estimate a *demand equation* for housing. The demand is represented by the following function:

$$qij = q(pj, mij, Ai)$$

where *qij*, the physical quantity demanded by household *i* located in *j*, has to be estimated indirectly as shown below; *pj* is the house price index; *mij* is the household income; and *Ai* is a vector of demographic characteristics, such as age, gender, and education. We allow housing prices to be different across markets.

In view of the available data, we were limited to using rental values for our estimations. In Argentina, rental housing represents around 12 percent of total dwellings. Although the rental market is small, rents are considered to be reasonably related to housing values.

We developed our estimation in six steps:

1. Permanent income estimates were calculated for each household (renters and owners).
2. Hedonic equations were estimated for renters by urban agglomerate. Two different approaches were used: one including permanent income as an independent variable to approximate the neighborhood characteristics and the other, excluding it.
3. Every household in the sample (owners and renters) was imputed an estimated rent using the previous hedonic equations in their two versions (with and without permanent income as an explanatory variable).
4. Relative prices for each of the urban agglomerates were computed based on the "average" dwelling rent of Buenos Aires City.
5. Quantity was estimated as the ratio between rent and "price" for each household by urban agglomerate.
6. The demand function was estimated and the Heckman correction was applied in order to correct for potential bias in the sample since owners and tenants are not randomly selected from the population.

3.2 The Data

To undertake this econometric exercise, we used the dataset of the National Survey of Household Expenditure and Income (ENGH in Spanish) collected in 1996/1997.[7] The sample included households living in cities with more than 5,000 inhabitants (according to the National Census of 1991). The sample covered 114 cities, whose total population is 28 million, equivalent to 96 percent of the urban population. The database divides the country into 6 regions and 12 sub-regions. These 12 sub-regions were used as Metropolitan Statistical Areas (MSA) in our estimation. The ENGH sample size covered almost 27,000 households. The survey contains information about the following features:

- Characteristics of the head of household: age, education level, gender, marital status, activity condition, type of job, etc.
- Household attributes: size, income, level and composition of expenditures, expenses, including infrastructure and maintenance outlays.
- Housing characteristics: tenure status, number of rooms and bathrooms, connections to utilities, etc. (See Table A13 to Table A15 in Annex 1).
- Housing quality: exterior wall materials, flooring, roof material, etc.
- Services: paved streets, street lights, running water, sewerage, and garbage collection.

Table 7 shows the sample distribution by tenure, owners, and renters. The latter represents 12 percent of total households, 30 percent in the case of apartments.

Table 5. Sample Size by Housing Tenure

ENGH - 1996/97

	Total	**Owners**	**Renters**	**Others**
Total	26,966	19,210	3,264	4,492
Houses	23,349	17,105	2,176	4,068
Apartments	3,617	2,105	1,088	424

Source: Authors' estimates based on ENGH Database. See the Statistical Annex for data by regions.

[7] Unfortunately, a similar survey collected during 2004 and 2005 is still unavailable for the whole country.

The survey did not provide information on property values. However, the ENGH contains rents paid by home renters. We used them to estimate *implicit rents* for owners.

Permanent income estimation: Following Zabel (2004) and Fontenla and González (2009), we decomposed income into a permanent and a transitory component. Permanent income was estimated taking into account household head characteristics: age, educational level, gender, marital status, employment situation (employed/unemployed), and type of employment (self-employed, employee). Household location by region was used as a control variable. Temporary income is defined as the difference between household current income and permanent income.

Housing hedonic equations for tenants: As expressed by Malpezzi (2002), the method of hedonic equations is one way expenditures on housing can be decomposed into measurable prices and quantities, so that rents for different dwellings or for identical dwellings in different places can be predicted and compared. In our model, the hedonic equation is a regression of rents on housing characteristics for each region. *Hn* is the vector that represents housing characteristics (number of bedrooms, surrounding amenities, quality of construction, etc.) of unit *n*. *Bj* is defined as the parameter vector (implicit prices of these characteristics), which is allowed to vary across markets, for each of the housing characteristics in *Hn*. Thus, the rent *v* of a housing unit *n* in the city *j* consumed by household *i* is given by the following equation:

$$v^{i}_{n,j} = v(Hn; Bj)$$

Then, if *Hn* as well as $v^{i}_{n,j}$ are known, it is possible to estimate *Bj* using a hedonic price model.

Characteristics included in our model correspond to dwelling structural characteristics (number of rooms, heating and air conditioning, roof quality, etc.) and to neighborhood characteristics corresponding to access to domiciliary services (natural gas, electricity, water and sanitation, telephone, etc.). Distance to public transportation was also used. Unfortunately variables reflecting other neighborhood amenities were not available. Table 8 lists the average characteristics, and Table A14 in Annex 1 shows the details by urban agglomerate (12 sub-regions).

Table 6. Dwelling and Neighborhood Characteristics

Characteristics	Variable Name	All Agglomerates	
		Mean	Std. Dev
monthly rent (in pesos)	v_viv	277,71	198,06
log of monthly rent	lnv_viv	5,43	0,65
permanent income (log)	lningper	6,77	0,60
number of household members (log)	lnmiembros	1,18	0,60
number of rooms (log)	lnnpiezas	1,03	0,44
number of bathrooms (log)	lncantbano	0,13	0,29
Kitchen for exclusive use of household (dummy)	coc_exc	0,93	0,26
Garage (dummy)	cocheras	0,27	0,45
Heating (dummy)	calefaccion	0,75	0,44
Air conditioning (dummy)	aire_acond	0,08	0,27
Telephone (dummy)	telef	0,49	0,50
Hot water (dummy)	agua_cal	0,56	0,50
Intercom (dummy)	port_elec	0,11	0,31
House (dummy)	casa	0,86	0,35
Apartment (dummy)	depto	0,13	0,34
Brick walls (dummy)	pared_ladri	0,91	0,29
Roof (dummy)	techo_losa	0,60	0,49
Garden (dummy)	jardines	0,46	0,50
Swimming pool (dummy)	piscina	0,02	0,13
Paved street (dummy)	pavimento	0,67	0,47
Natural gas access (dummy)	redgas	0,62	0,49
Transportation within 8 blocks (dummy)	transporte	0,95	0,22
Electricity access (dummy)	electricidad	0,99	0,11
Sanitation access	red_cloacal	0,59	0,49

Source: Authors' estimates based on ENGH Database.

Many potential housing characteristics could be included on the right-hand side of our equation. We tried most of the variables included in the ENGH, but several conveyed similar information (were highly correlated) or no information at all (every dwelling in the survey possessed the considered characteristic). Unfortunately, two key variables not included in the survey were: size of the unit and age of the unit. Number of rooms and number of household members were used as proxy variables for unit size.

Hedonic regressions were estimated for tenants by agglomeration. A usual criticism when focusing the estimation on rents stems from the fact that different units may have different lease terms or contract conditions. In Argentina, practice and regulation of the lease contract make this problem less important since most contracts show similar features: an extension of two years and a rent net of any utility service payment. With respect to property taxes, they are generally paid directly by the tenant, added to the rent. This latter fact might be a source of distortion in our price estimation since property taxes are different across regions but similar within regions. The parameters of these regressions (the hedonic prices) are used below to impute rents to the household owners in the sample. This method

may be subject to criticism due to the small proportion of renters in the population and to potential distortions in the rental market. In fact, to go from rents to house values may entail several weaknesses, including the following:

- Competitive markets are required in order to price attributes through a hedonic model. Often in developing economies, rents are regulated. This problem did not apply in the case of Argentine housing market given that government intervention was relatively low[8] and there were many suppliers.
- Identical discount rates are assumed across heterogeneous families. If this were not the case, rental prices would not be linearly related to property values. For instance, wealthier families might face lower interest rates than the average, and implicit property rent would overestimate the true housing consumption.
- Families may ascribe different values to house attributes and there may be non-observable characteristics. This can be partially solved by estimating implicit rents with quantile regressions where the hedonic equation is estimated for each quantile of the conditional income distribution.[9]

Table 9 shows the rent-to-income ratio by region in the year of the survey. Percentages are noticeably similar across the country, suggesting that property value, rents and income levels, which are different according to the location, vary proportionally between regions.

[8] In spite of its quantitative importance, the state housing program is focused on low-cost shelters for low-income families.

[9] This procedure was followed by Gasparini and Sosa Escudero (2004) to estimate implicit rents in the Greater Buenos Aires area.

Table 7. Rent as a Share of Household Income, 1996-97

Rents as a share of household income- 1996-97

Region	Rents (a)	Income (b)	(a) / (b) %
Buenos Aires City	384,97	1.560,68	24,7
Conurbano Bonaerense	330,81	1.041,65	31,8
Córdoba y La Pampa	238,85	990,10	24,1
Santa Fe y Entre Ríos	239,85	866,31	27,7
Resto de Buenos Aires	266,28	1.019,19	26,1
Jujuy, Salta y Tucumán	211,88	864,51	24,5
La Rioja, Catamarca y Sgo del Estero	232,48	938,32	24,8
Misiones y Corrientes	225,69	822,64	27,4
Chaco y Formosa	229,14	826,30	27,7
San Juan, Mendoza y San Luis	239,33	887,87	27,0
Neuquén y Río Negro	276,07	998,50	27,6
Chubut, Santa Cruz y T. del Fuego	374,28	1.582,90	23,6

Source: Authors' estimates based on ENGH Database.

Based on the vector of house rents, we estimate a hedonic model as a function of observable housing characteristics with renters' data. (See Tables A1 and A2 in Annex 1). Table A1 shows the regressions that include permanent income as an explanatory variable. This inclusion follows the same rationale as in Fontenla and González (2009), where permanent income is used as a proxy of neighborhood quality (they used age, education, and marital status). The exclusion of this variable alters the results for the hedonic prices, but as we shall see, modifies only slightly the elasticity estimates. Housing characteristics vary slightly between the two models (see Table A2).

Imputed rents: Using the hedonic equation, we can predict how much a family owning its house would be willing to pay for it, thus imputing an implicit rent to home owners. We present two alternative calculations, varying the characteristics included in the hedonic equation. In Table 10, effective rents are compared with the rents imputed by the model.

Table 8. Rents and Imputed Rent

Rents and imputed rent

	Model I 1/			Model II 1/		
	Rents (a)	Imputed Rent (b)	(a) / (b) %	Rents (a)	Imputed Rent (b)	(a) / (b) %
Capital Federal	384,97	451,22	(14,7)	384,97	447,67	(14,0)
Conurbano Bonaerense	330,81	372,33	(11,2)	330,81	379,64	(12,9)
Córdoba y La Pampa	238,85	254,90	(6,3)	238,85	260,67	(8,4)
Santa Fe y Entre Ríos	239,85	254,59	(5,8)	239,85	258,51	(7,2)
Resto de Buenos Aires	266,28	267,93	(0,6)	266,28	267,15	(0,3)
Jujuy, Salta y Tucumán	211,88	256,07	(17,3)	211,88	258,23	(17,9)
La Rioja, Catamarca y Sgo del Estero	232,48	288,21	(19,3)	232,48	299,41	(22,4)
Misiones y Corrientes	225,69	222,34	1,5	225,69	236,50	(4,6)
Chaco y Formosa	229,14	236,49	(3,1)	229,14	240,40	(4,7)
San Juan, Mendoza y San Luis	239,33	250,91	(4,6)	239,33	259,15	(7,6)
Neuquén y Río Negro	276,07	290,29	(4,9)	276,07	306,70	(10,0)
Chubut, Santa Cruz y T. del Fuego	374,28	367,81	1,8	374,28	380,01	(1,5)

1/ Model I corresponds to the hedonic price estimations with Permanent Income. Model II corresponds to the estimations without Permanent Income

Both cases exhibit a bias towards rent overestimation when compared to the actual rent. It is slightly higher in the second case, suggesting the existence of some omitted variable. Rents imputed to owners exhibit an expected rent/income ratio varying between 22 and 34 percent across regions, with levels similar to those shown for actual tenants. One important fact to keep in mind for results interpretation is the nature of imputed rents: not being actual out-of-the-pocket costs for shelter, they may differ from the owner's willingness to pay for housing services. In developing countries, owners remain in the property for very long periods and have time to accumulate assets in the form of housing whose imputed rent they may not be able to pay at all times.

3.3 Price Estimation

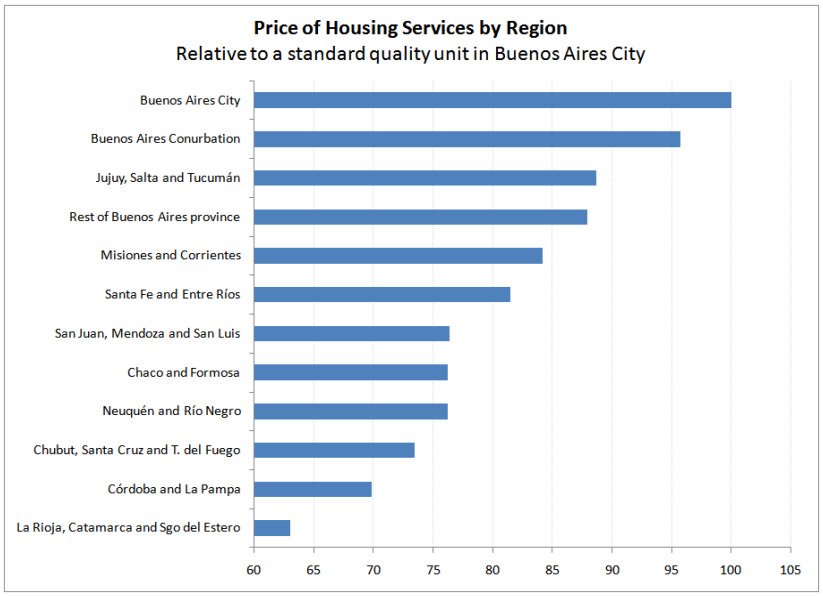
The price index is computed defining a standard unit as H^*_n which corresponds to the average characteristics of a housing unit in Buenos Aires City:

$$Pj = 100 \text{ X } v(Hn; Bj)/ v(H^*n; B1)$$

where the market for which pj=100 if j=1 (Buenos Aires City).

Figure 16 shows the distribution of prices relative to Buenos Aires City across regions for the case of estimated rents, including permanent income.

Figure 14. Prices of Housing Services by Region



We think of each sub-region as a metropolitan statistical area (MSA), i.e., a contiguous area of relatively high population density, coinciding with distinct urban labor markets.

3.3.1 Quantities

The value of the housing unit *n* in market *j* consumed by household *i* can be expressed as $v^{i}_{n,j}$ =qij*pj; and the quantity consumed can be obtained as:

$qij= v^{i}_{n,j}/ pj$

Therefore, once *qij* is calculated, it is possible to estimate the demand equation.

3.3.2 Demand Equation

We elaborated two versions for the demand equation. *Model I* uses the hedonic price estimations based on the equation *with the permanent income included* as explanatory variable (proxy of neighborhood quality) and *Model II does not include it*.

Price and income elasticities of housing demand were estimated with the entire sample and with the two separated groups, owners and renters. When estimated for the split groups, we corrected for sample selection using the Heckman (1979) two-step estimator in

order to avoid distorted elasticity values. The results confirm the limited influence of selection bias (see Table 11). In Annex 1, we present the complete results (see the Table A16 and Table A17).

Table 11. Housing Demand Estimations
Elasticities 3/

	Specification		Permanent Income	Price	Positive Temporary Income 4/	Negative Temporary Income 4/
			All Households			
OLS Model I 1/	Column (1) Table A 16	(1)	0.534 ***	-0.534 ***	0.031 ***	-0.010 ***
OLS Model II 1/	Column (3) Table A 16	(2)	0.411 ***	-0.471 ***	0.036 ***	-0.011 ***
			Owners			
OLS Model I 1/	Column (1) Table A 16	(3)	0.517 ***	-0.533 ***	0.028 ***	-0.005 ***
OLS Model II 1/	Column (3) Table A 16	(4)	0.372 ***	-0.454 ***	0.033 ***	-0.005 **
Heckman M. 2/	Column (1) Table A 17	(5)	0.503 ***	-0.531 ***	0.028 ***	-0.004 ***
			Tenants			
OLS Model I 1/	Column (1) Table A 16	(6)	0.663 ***	-0.522 ***	0.055 ***	-0.035 ***
OLS Model II 1/	Column (3) Table A 16	(7)	0.649 ***	-0.513 ***	0.054 ***	-0.036 ***
Heckman M. 2/	Column (2) Table A 17	(8)	0.714 ***	-0.508 ***	0.050 ***	-0.036 ***

1/ Corresponds to a log lineal specification. Endogenous variable: natural log of rents. Model I corresponds to the hedonic price estimations with Permanent Income. Model II corresponds to the equations without Permanent Income.

2/ Regression models with sample selection correction by Heckman (1979) two step procedure. Hedonic price estimations with Permanent Income.

3/ (***) Statistically significant at the 1%; (**) statistically significant at the 5%; (*) statistically significant at the 10%.

4/ Corresponds to income plus 1, to avoid the indefiniteness of the natural log.

The key results in terms of price and income elasticities are the following:

- Permanent income elasticities for the sample are in line with those reported in the literature: from 0.41 to 0.53 according to the model considered (rows (1) or (2)).
- Tenants are more elastic than owners to changes in permanent income, regardless of the specification estimated. In fact, given that owners live in the same house for long periods, once it is purchased, they are less responsive to changes in permanent income. However, in a survey for developing countries, Malpezzi and Mayo (1987) found that income elasticities tend to be lower for renters than for homeowners.

- For the same reasons, elasticities for temporary income changes are lower for owners than for renters and they are a modest fraction of those calculated for the permanent income (less than 10 percent). The response to a transitory fall in income is smaller than to an increase. The significant coefficients for the temporary income shocks suggest that housing consumption smoothing presents obstacles, mainly due to the deficiencies of the mortgage market.
- Demand for housing is inelastic to changes in house prices, estimated at around 0.5 with no significant differences between owners and tenants. This result also may be consistent with a deficient functioning of the mortgage market (i.e., consumption smoothing is difficult in the housing market) and with the existence of transaction costs for real estate operations. Fontenla and González (2009) also mention this fact, indicating that the lack of good substitutes to owning in Mexico reduces the price elasticity of demand, and many households become owners through self-help housing construction and progressive housing.
- Corrections for the existence of endogenous sample selections using the Heckman two-step estimators indicate that, in fact, tenants are different from owners (see Annex 1 for complete results and rows (5) and (8) in Table 11 above). With this correction included, elasticities estimated for the sample of owners do not change significantly. However, in the case of the group of tenants, elasticity of the permanent income variable becomes slightly larger than the case without the correction (see rows (6) and (8) for a comparison). That is, renters are even more responsive to changes in income than owners when differences between them are taken into account.
- Regarding other explanatory variables included in the equation (see Annex 1, Table A16 and Table A17), the age variable is statistically significant and positive in the case of owners, suggesting that access and progressive completion of the house improve with age, probably due to the changing needs along the life cycle, the increasing possibility of

getting a loan or accumulating savings for a down payment or, eventually, receiving an inheritance. This result is the opposite of the one found in the Mexican case. When controlling for selection, the sample of renters shows that at older ages the demand for housing is lower.

- Also, if the household head is a male (variable Gender), demand for housing tends to be lower (similar to Mexico).
- Finally, if the head of household is married, she decreases her demand, suggesting some degree of under-consumption. This result may be interpreted as the consequence of introducing longer-term plans when the family has to raise children (effectively or potentially) in an economy where consumption smoothing is difficult and unemployment fluctuations are important.

3.4 Estimate of Tenure Choices with a Multinomial Logistic Model

In this section we present an econometric exercise to determine the factors influencing tenure choices by households. In the standard approach, the election is generally restricted between ownership or renting. In this case, we allow for categories that illustrate household choices of the quality of the house where they are to live.

Table 12 summarizes the alternative tenure choices used in our exercise. Being an owner may imply having either a good-quality house or a low-quality one. Renters may also choose between two types of houses, of average quality or of lower quality.

Thus, there are five different tenure choices: owning and renting a good quality house, owning and renting a low quality unit or any other remaining options (such as living in a dwelling provided by the employer or occupying it with the owner's consent).

Table 9. Alternative Tenure Choices

Tenure	Category in the EPH	Quality standard
Ownership	House and plot ownership	All except those included in Owning and Renting a low quality house.
Renting	Renting	
Owning a low quality house	House and plot ownership House only ownership	Any of the following: - Located near a garbage dump - Located in a flooding area - Located in a slum - Plumbing facilities unavailable - Lack of electricity - Shared bathroom - Precarious outer wall, roof, floor or ceiling material - Overcrowded rooms (e.g., more than 2 persons)
Renting a low quality house	Renting	
Others	The remaining categories	All.

Source: Authors' calculations based on available EPH categories.

The determinants of the tenure choice will be analyzed using a multinomial logistic model. This model adjusts best to the multiple choices available. There is one equation for each category to be estimated where each selected category is measured relative to a reference category (e.g., owning a good unit). Thus, if the first category is used as the reference, then, for the remaining categories m=2..5, the equation to be estimated is:

$$\ln \frac{P(Yi=m)}{P(Yi=1)} = \alpha_m + \sum_{k=1}^{K} \beta_{mk} X_{ik} = Z_{mi}$$

Then, there will be four equations (m-1) predicting log odds, one for each category relative to the reference category. Vector X contains all the observable characteristics supposed to have an effect on the tenure choice. The individual probabilities can be calculated as:

$$P(Yi=m) = \frac{\exp(Z_{mi})}{1+\sum_{h=2}^{M} \exp(Z_{hi})}$$

The observable characteristics included in the regression analysis are standard in tenure choice models (e.g., Chiuri and Jappelli, 2003). In fact, the econometric model posits that the probability of different tenure choices is a function of the age and squared-age;[10]

[10] We omitted cubic age used by the above mentioned authors.

level of education of the household head;[11] family size measured by the number of children; gender of household head; current income level; if the head is unemployed; migration conditions such as recent migrant and origin, domestic or from neighboring countries; and, finally, whether the head of household works in domestic service. As regards the latter, Goytia et al. (2010) found that working in the domestic service sector was a significant determinant of land tenure in Argentina.

We used the dataset of the Permanent Household Survey (EPH in Spanish) corresponding to the last quarter of 2009. This estimation provides a picture of the structural aspects of the choice process influenced by the given macroeconomic scenario.

Table 13 shows the descriptive statistics of the database. In the case of good-quality houses, 45 percent of families are owners and 12 percent are renters. In contrast, 25 percent of total households own and 6 percent rent a low-quality dwelling.

Life-cycle models of tenure choice predict that ownership and home quality rises as the age of the head of household increase (e.g., Ortaló-Magné and Rady, 1998). The table indicates that average age is higher for owners than for renters and also for heads of household living in reasonable quality houses than those living in low-quality units. That is, quality and ownership increase over time.

Income is relatively higher for families living in houses of better quality, but there are no differences, a priori, in household incomes reported by owners and renters. More years of education are observed in heads renting than owning a house, but this can be explained by the larger proportion of younger people among the more educated group. Nevertheless, again there are differences in the quality related to educated people: as level of education increases, so does the quality of the house.

[11] It is used as a proxy for permanent income.

Table 10. Basic Statistics

		Tenure	age	female	Ln(income)	years of education	mig1 From neighboring countries	mig2 From othe countries	mig3 Recent domestic migrant	mig4 As mig1 but recently	mig5 As mig2 but recently	Unemployed	Domestic service	Number of children
Owning	Mean	44.7	57.0	0.36	7.95	11.9	0.029	0.031	0.009	0.001	0.002	0.026	0.017	1.0
	S.D.		16.2	0.48	0.81	4.1	0.167	0.173	0.095	0.029	0.045	0.158	0.130	1.1
Renting	Mean	12.2	41.3	0.40	8.00	13.7	0.032	0.029	0.107	0.007	0.015	0.029	0.021	0.6
	S.D.		16.2	0.49	0.73	3.5	0.176	0.167	0.309	0.082	0.120	0.167	0.145	0.9
Owning a low-quality house	Mean	25.4	49.7	0.31	7.74	9.9	0.055	0.019	0.007	0.002	0.001	0.039	0.044	2.0
	S.D.		14.7	0.46	0.83	3.8	0.228	0.137	0.083	0.044	0.033	0.193	0.204	1.8
Renting a low-quality house	Mean	5.4	39.4	0.28	7.72	11.4	0.100	0.038	0.055	0.022	0.015	0.046	0.060	1.7
	S.D.		12.1	0.45	0.79	3.3	0.300	0.190	0.228	0.146	0.120	0.209	0.238	1.4
Others	Mean	12.2	45.9	0.35	7.54	10.4	0.051	0.016	0.017	0.002	0.001	0.040	0.062	1.6
	S.D.		16.0	0.48	0.78	3.5	0.220	0.125	0.128	0.045	0.037	0.197	0.242	1.6
Total	Mean	100.0	50.9	0.35	7.84	11.4	0.042	0.026	0.024	0.003	0.004	0.032	0.032	1.4
	S.D.		16.8	0.48	0.82	4.0	0.202	0.159	0.153	0.056	0.063	0.177	0.177	1.5
	Obs.		17,807											

Source: Authors' calculations based on EPH, Fourth Quarter 2009.

Migrant households are more prone to rent than to own a house. However, migrants-from neighboring countries tend to rent a low-quality house whereas domestic migrants (from other provinces) also rent, but higher-quality ones. Finally, larger families tend to be owners but at the cost of lower quality.

3.5 Results

In Table 14 we present the results from the multinomial logistic model. The table contains the exponential coefficients that can be interpreted as odds ratios, the so called *relative risk ratios*. They represent the change in the odds of being in the dependent variable category versus the comparison category associated with a one-unit change in the independent variable, provided the other variables in the model are held constant. The reference tenure choice is ownership of a good-quality house, so all the relative risk ratios must be interpreted as relative to this tenure choice.

Column (1) presents the relative risk ratios (RRR) for renting a good-quality house relative to owning it. Column (2) displays the RRR for owning a low-quality house relative

to owning a good-quality home. Similarly, column (3) refers to RRR for renting a low-quality house to owning a good-quality one and column (4) to RRR for other choices relative to the reference tenure choice.

For instance, column (1) indicates that as age increases (coefficient of 0.89), heads of household are expected to become owners of a good-quality house compared to renting a similar standard dwelling (the coefficient is lower than one, which means that the denominator presents more advantages to be chosen that the numerator).

Following this interpretation, we found that the same behavior is expected regarding the age of the head relative to owning or renting a low-quality house (Columns (2) and (3), respectively).[12] In all cases, older heads are more likely to own a good-quality house than any other choice.

Table 14. Multinomial Logistic Regression with Controls by Agglomeration Relative Risk Ratios and Standard Deviations

Variable	P(Rent)/P(Own) (1)		P(Own LQ)/P(Own) (2)		P(Rent LQ)/P(Own) (3)		P(Others)/ P(Own) (4)	
Age	0.8961	***	0.9636	***	0.9301	***	0.9007	***
	0.0101		0.0122		0.0138		0.0172	
Squared Age	1.0005	***	1.0001		0.9998		1.0005	***
	0.0001		0.0001		0.0001		0.0002	
Female	1.4152	***	0.8177	***	0.7662	**	0.8758	*
	0.0991		0.0335		0.1023		0.0607	
L(income)	1.0681		0.7488	***	0.6672	***	0.5302	***
	0.0688		0.0545		0.0210		0.0148	
Education	1.0056		0.8702	***	0.8865	***	0.8845	***
	0.0247		0.0085		0.0120		0.0134	
mig1	1.5363		1.6574	**	2.8058	**	1.4897	*
	0.5632		0.3295		1.2034		0.3038	
mig2	1.4976	***	1.0268		3.0267		0.7521	
	0.2173		0.1442		2.2500		0.2405	
mig3	4.7195	***	0.8169		3.8683	***	1.3536	
	0.7166		0.1974		1.2905		0.3596	

[12] Given that the fifth tenure choice is a residual category, we disregard further comments on these results unless it is necessary.

Table 14., continued

Variable	P(Rent)/P(Own) (1)		P(Own LQ)/P(Own) (2)		P(Rent LQ)/P(Own) (3)		P(Others)/ P(Own) (4)	
mig4	3.2801	***	1.7995		4.9486	***	1.2586	
	0.3082		1.3437		2.5670		1.3297	
mig5	4.0476		1.1330		6.6076		1.4995	
	4.3995		0.5646		8.1673		1.6162	
Unemployed	0.7237		0.9106		0.9837		0.6919	***
	0.2148		0.0867		0.1980		0.0682	
Domest Service	1.1541		1.6733	***	2.2574	***	2.1176	***
	0.2014		0.2352		0.6125		0.4900	
# Children	0.6492	***	1.4887	***	1.2471	***	1.2627	***
	0.0243		0.0306		0.0326		0.0170	
Pseudo R-Square			0.1672					
Obs.	7,471,367							
Log pseudolikelihood = -8,575,637.5								
log pseudolikelihood(0)= -10,296,825								
Std. Err. adjusted for 32 clusters by agglomerates.								

But what would the results be for other alternatives, for instance, renting versus owning a lower quality home? Table 15 shows the probabilities for the different tenure choices along age groups, holding the rest of the variables at their sample average. As expected, until he or she is 34 years old, the average head of household is more likely to rent a house of reasonable quality. The next step she would take is buying a house, although giving up some comfortable features. By age 40 and later, she is more likely to buy a house of better quality, and the chances of doing it increase as time passes. Renting a good house is more probable than renting a substandard home except for the elderly. Except at early ages, owning a bad-quality house is always more preferable for the average HH than renting any other type of house. At the average age of about 50.4 years old, there is a 52 percent probability of owning a dwelling of reasonable standards, 24 percent of owning a low-quality house and 13 percent of renting.

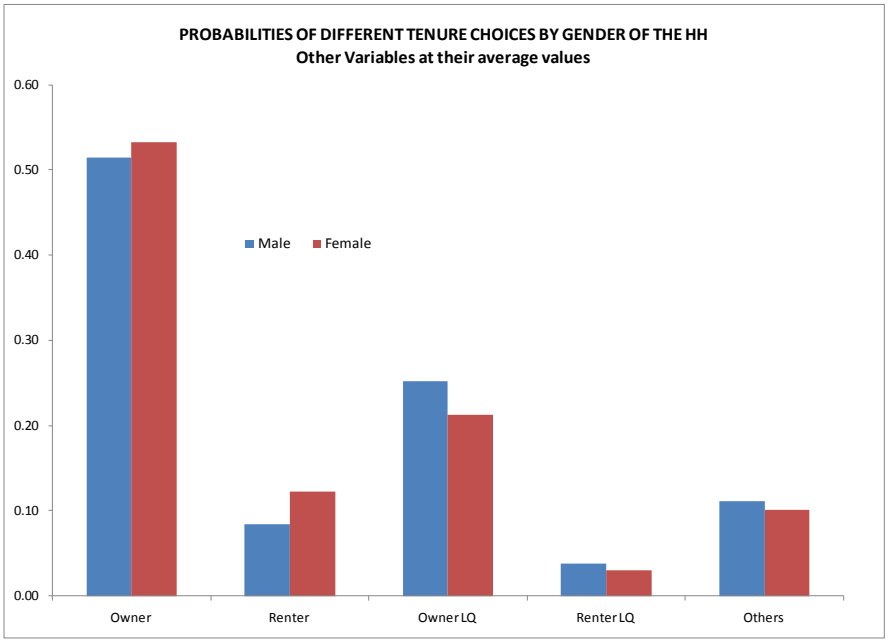
Table 11. Probabilities for Different Age Groups

Age of the HH	Good-quality house		Low-quality house		Others
	Owner	Renter	Owner	Renter	
20-24	0.095	**0.372**	0.121	0.049	0.364
25-29	0.141	**0.328**	0.151	0.051	0.328
30-34	0.204	**0.277**	0.183	0.052	0.284
35-39	**0.284**	**0.222**	**0.211**	0.050	0.234
40-44	**0.371**	0.170	0.230	0.046	0.183
45-49	**0.465**	0.122	0.239	0.040	0.135
50-54	**0.552**	0.084	0.236	0.033	0.095
55-59	**0.630**	0.056	0.224	0.026	0.065
60-64	**0.697**	0.035	0.206	0.020	0.042
65-69	**0.750**	0.022	0.185	0.015	0.027
70-74	**0.796**	0.014	0.163	0.011	0.017
75-79	**0.832**	0.008	0.141	0.008	0.011
80-84	**0.860**	0.005	0.123	0.006	0.007
85+	**0.896**	0.002	0.095	0.004	0.003
Total	0.522	0.096	0.238	0.036	0.108

Note: All observable characteristics are held at the national sample average.

If the household head is a female, the RRR show that she is more likely to rent than own a good-quality home (column (1)) compared to males. However, she would probably own a good unit rather than owning (column (2)) or renting a low standard one (column (3)). In all cases, as can be seen in Figure 17, women choose houses with better standards than men.

Figure 15. Probabilities of Tenure Choices by Gender of Head of Household



Income levels also help to explain tenure choices. Table 16 summarizes the exponential coefficients (or relative risk ratio RRR) of some independent variables for different choices. The first observation to be noted is that income levels do not make any difference in explaining whether owning or renting a good-quality house is preferable (2 to 1 and vice versa). Also, it barely helps to determine the choice between owning and renting a low-quality unit (3 to 4 and vice versa). That is, household income level is not a good predictor of choices between renting and owning a house.

However, it helps to determine whether the choice will be between a good or a bad dwelling (1 to 3, 2 to 4, 2 to 3 and 1 to 4 and vice versa). In fact, renting a comfortable home is always more probable than living in a low-quality one (whether as renter or owner) as income grows.[13] Furthermore, owning a good house is more likely when the family becomes richer.

Table 16 also shows the RRR for years of education. Years of education is not a determinant of renting or owning a house of comparable quality (2 to 1, 3 to 4 and vice versa). As in the case of income levels, the variable years of education helps to explain choices between different dwelling qualities. Renting a reasonable property is more probable as education increases than living in substandard housing. The same results are found comparing owning to other options of lower quality houses.

Being unemployed is not a determinant of any particular type of tenure or quality. Working in domestic service increases the probabilities of living in a substandard unit, compared to buying a higher-quality house.

Finally, having more children raises the chances of owning a house compared to renting when the quality is the same (uneven alternatives dominate the even ones). Also, it is more likely that the household will own a low-quality house than rent a good one (3 to 2). But if renting, a substandard unit dominates the election (4 to 2).

[13] These can be seen in the exponential coefficients that represent the odds ratios. For instance, comparing 2 to 3 the RRR is 1.426 which means that one percent increase in income raises more the probability of choosing 2 than choosing 3 by 42.6 percent.

Table 12. RRR between Tenure Choices and Independent Variables
1 = Owner; 2= Renter; 3= Owner LQ; 4= Renter LQ

Odds comparing alternatives	Income		Years of education		Unemployed	Domestic service activity		Children	
2 to 3	1.426	**	1.156	**	0.795	0.690		0.436	**
2 to 4	1.601	**	1.134	**	0.736	0.511		0.521	**
2 to 1	1.068		1.006		0.724	1.154		0.649	**
3 to 2	0.701	**	0.865	**	1.258	1.450		2.293	**
3 to 4	1.122		0.982		0.926	0.741		1.194	**
3 to 1	0.749	**	0.870	**	0.911	1.673	**	1.489	**
4 to 2	0.625	**	0.882	**	1.359	1.956		1.921	**
4 to 3	0.891		1.019		1.080	1.349		0.838	**
4 to 1	0.667	**	0.887	**	0.984	2.257	**	1.247	**
1 to 2	0.936		0.994		1.382	0.867		1.540	**
1 to 3	1.336	**	1.149	**	1.098	0.598	**	0.672	**
1 to 4	1.499	**	1.128	**	1.017	0.443	**	0.802	**

Notes: RRR is relative risk ratio or e^b = exp(b) = factor change in odds for unit increase in X. We omit the tenure choice "Others". Variables: Significant at 1% (**) and 5% (*).

Table 17 presents the relative risk ratios for different migrant conditions. Immigrants from neighboring countries (mig1) are more prone to rent a low-quality house (alternative 4) than to live in a higher-standard dwelling. Recently arrived migrants from these countries (mig4) show higher probabilities of renting to owning, whatever the home quality. Also, immigrants from other non-neighboring countries are more likely to rent a house (mig2) than own one of lower quality. However, if they are recently arrived (mig5), they will rent a substandard dwelling. Finally, migrants from other provinces (mig3) are more likely to rent a house (even alternatives dominate uneven ones).

Table 13. RRR between Tenure Choice and Migrant Condition
1 = Owner; 2= Renter; 3= Owner LQ; 4= Renter LQ

Odds comparing alternatives	mig1		mig2		mig3		mig4		mig5	
2 to 3	0.927		1.459	*	5.777	**	1.823		3.573	
2 to 4	0.548	**	0.495		1.220		0.663		0.613	
2 to 1	1.536		1.498	**	4.720	**	3.280	**	4.048	
3 to 2	1.079		0.686	*	0.173	**	0.549		0.280	
3 to 4	0.591	*	0.339		0.211	**	0.364	**	0.172	*
3 to 1	1.657	*	1.027		0.817		1.800		1.133	
4 to 2	1.826	**	2.021		0.820		1.509		1.633	
4 to 3	1.693	*	2.948		4.735	**	2.750	**	5.832	*
4 to 1	2.806	*	3.027		3.868	**	4.949	**	6.608	
1 to 2	0.651		0.668	**	0.212	**	0.305	**	0.247	
1 to 3	0.603	*	0.974		1.224		0.556		0.883	
1 to 4	0.356	*	0.330		0.259	**	0.202	**	0.151	

Notes: RRR is relative risk ratio or e^b = exp(b) = factor change in odds for unit increase in X. We omit the tenure choice "Others". Variables: mig1 = migrant from neighboring countries; mig2=migrant from other countries; mig3= recent migrant from other provinces; mig4= recent migrant from neighboring countries and mig5= recent migrant from other countries. Significant at 1% (**) and 5% (*).

There is great disparity in housing conditions across cities. For instance, 55.4 percent of households own a house of reasonable quality in Ushuaia (Tierra del Fuego) whereas only 29 percent are in a condition to do so in Salta; 23.8 percent are renters in Rio Gallegos, far from the 3 percent in Santiago del Estero. The same can be said when analyzing the tenure status of substandard units: 48 percent of families in Santiago del Estero own their own house and only 11 percent in Santa Rosa (La Pampa); 14 percent rent in Rio Gallegos but only 1.4 percent in Santiago del Estero, a city where the stock of houses for rent is of a much better quality than those owned.

Not only tenure choice varies; the quality of housing stock is also highly diverse across cities and depending on the tenure. Generally speaking, most of the cities present a larger proportion of good-quality units for renting than those owned: the average for renting is 69 percent, whereas it is 64 percent for owned houses. Some agglomerates such as Gran Tucuman present extreme cases: 81 percent of rented houses and only 46 percent of owned

units are of good quality. In Jujuy, the proportions are 47 percent and 66 percent respectively.[14]

Table 14. Rates across Agglomerates: 32 Main Urban Cities, 2009

	Owners	Renters	Owners LQ	Renters LQ	Others
Mean (arithmetic)	0.466	0.137	0.240	0.051	0.107
Average (weighted)	0.447	0.122	0.254	0.054	0.122
Median	0.475	0.142	0.235	0.046	0.104
Standard Deviation	0.081	0.056	0.095	0.025	0.036
Coeff. Dispersion	0.181	0.457	0.375	0.454	0.295
Max	0.580	0.238	0.479	0.139	0.177
Min	0.282	0.030	0.100	0.014	0.035

Source: Based on EPH 2009.

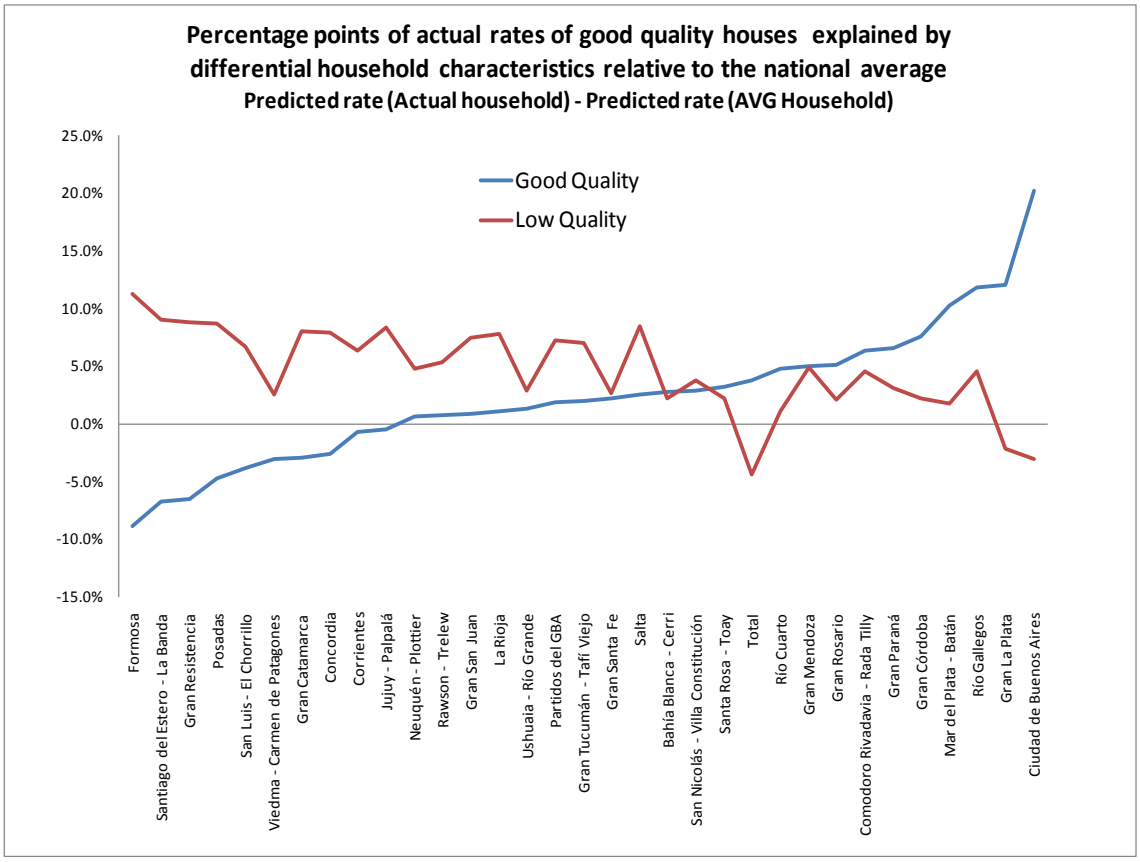
What can our multinomial logit model say about these geographic variations? Figure 18 shows the percentage points of actual rates of reasonable quality houses that are explained by city differences in household characteristics relative to the national average.[15] We can observe that almost 20 percentage points of good-quality houses in the City of Buenos Aires are explained by the observed household attributes that are different than the average of the whole sample. In this sense, this figure can be interpreted as the contribution to the share of reasonable quality dwellings due to the family composition (set of household attributes) of the agglomerate by itself. Thus, it can be argued that cities with positive contributions are prone to demand good quality houses because of their family types.

In the case of the city of Buenos Aires, factors contributing positively to this type of demand are: incomes, age of the head of household, and years of education above the national average. The composition of Formosa's population shows younger and less educated household heads, lower incomes and larger family sizes. By the same token, low quality rates mirror these percentages.

[14] See Table A17 in Annex 1.

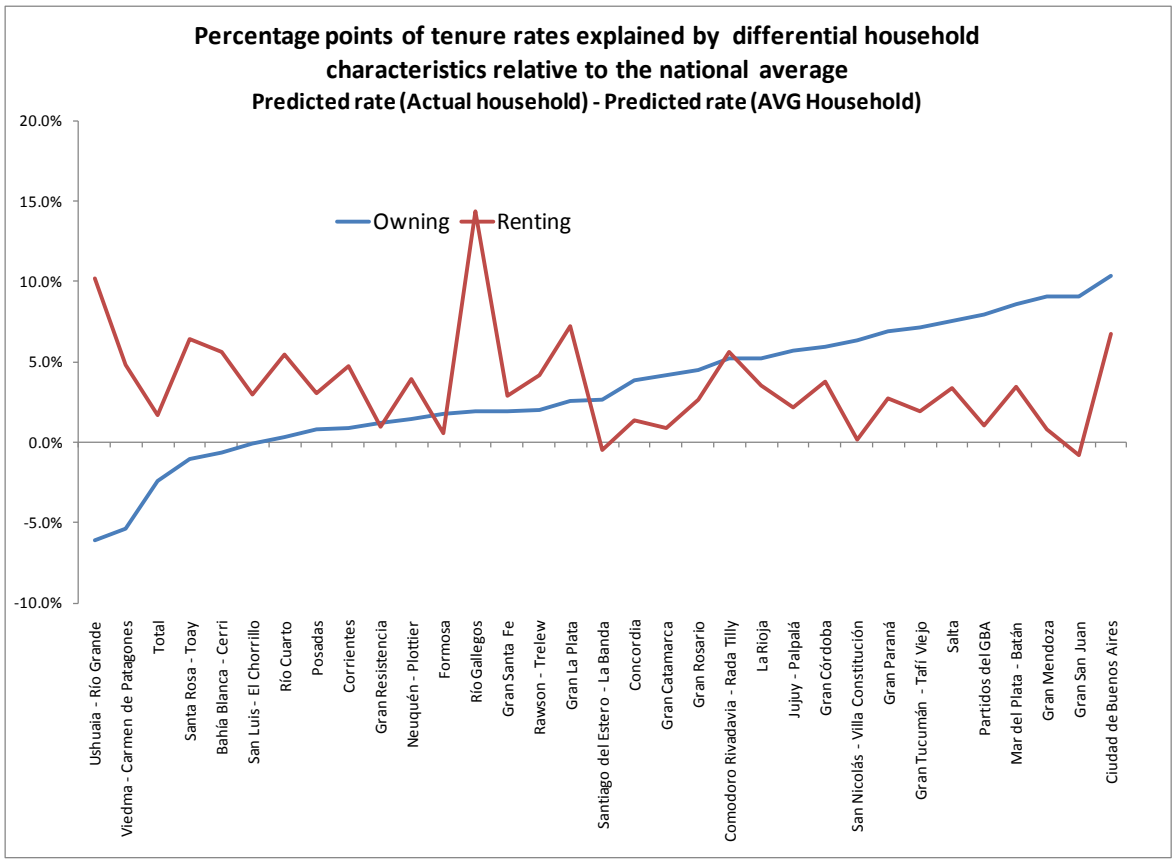
[15] Percentage points explained by household's characteristics relative to the national average are estimated as the difference between predicted probabilities and the predicted probability for the national average home.

Figure 16. Percentage Differentials of Good Quality Houses



Finally, Figure 19 shows the percentage points of actual tenure rates explained by different observed characteristics relative to the sample average. Thus, households from the city of Buenos Aires are more prone to own or to rent a house than, for instance, those from Ushuaia-Rio Grande or Viedma due to family composition. In cities such as Rio Gallegos, La Plata, or even Rio Grande, renting dominates ownership.

Figure 17. Percentage Differentials of Tenure Rates



4. Housing Market, Construction, and Activity Level: Stylized Facts

Housing is a not only durable consumption good, but also one of the most important household assets. Housing demand is linked to the interest rate and to the evolution of the financial markets. Construction companies and developers evaluate market risk taking into account the evolution of alternative financial assets. This influence may be disproportionate, distorting housing market operations in the case of extreme macroeconomic volatility and uncertain property rights.

Stylized facts based on the information presented in the previous sections may be stated for the Argentine case as follows. Housing supply is subject to cyclical movements and, in the long run, responds to demand stimulus. It is the nature of this stimulus that distinguishes this case. When considering potential demand actors by income level, only the higher end of the income scale is active in the market on a permanent basis, though it is influenced by the business cycle. For this segment of the market, positive income shocks

translate into increases in demand for housing due both to a wealth effect and to changes in investment portfolio composition. These shifts in income may result from windfall gains, such as the increase in agricultural commodity prices in 2006-2008, or to more permanent economic patterns, as reflected by income concentration since the 1990s.

Recurrent macroeconomic instability may also push portfolio shifts towards more secure assets, such as new one-bedroom apartments for renting or for occasional use (complementing suburban homes). Finally, rich families may pursue new status consumption or changes in preferences (i.e., living in suburban gated communities in the 1990s). Instead, demand on the part of medium-income households crucially depends on mortgage loan availability, savings capacity for down payments, and affordability. Thus, only a portion of them are active in the housing market, demanding new or used houses.

Expansion of demand for new construction depends on the availability of credit, as exemplified in Argentina in the 1990s. In the absence of a mortgage market, this segment of demand will be constrained to participating in the market for used property filtering down from the upper segment, adapting their homes through incremental construction, or building self-help housing on their own plots. Renting is also an option for this segment under restricted conditions (i.e., access requirements may be stringent and the ability to rent long-term may be uncertain). Low-income households are generally excluded from formal housing markets.

Generally speaking, housing policies have been ineffective in promoting the improvement of the housing market (except for a very short period in the mid-1990s) and in particular, social housing initiatives have been poorly organized and have had poor results over time. In spite of this apparently unsatisfactory functioning of the housing market, the housing situation has not worsened enough to prompt urgent policy interventions. Consequently, housing ownership was not among the highest priorities of voters until recently. Evidence shows a relatively high share of repairs, renovation, and incremental construction in the housing market, suggesting that progressive construction is a permanent activity, financed by owners using their own savings or small personal loans.

Among the factors favoring access of middle-income households to formal housing are: the pace of household formation, which has been influenced by lower population growth, and marriage at older ages; the reduction of household size, allowing for larger

inheritances to finance down payments or simply to enable people to afford new houses; and to a lesser extent, the filtering down of houses from high-income deciles to lower-income households. Over time, demographic factors shifting housing demand outward have also influenced the market: increases in the divorce rate are associated with the expansion of one-member households, and the increase in life expectancy has reduced the turnover of the housing stock. However, the situation may be changing rapidly in large urban centers, judging from recent land invasions. Several factors have converged to increase this hazard: the increase of population living in overcrowded conditions in large urban centers and the higher rents charged for housing accommodation in informal settlements, among others.

Argentina has had episodes characterized by important disruptions in the housing market due to recurrent macroeconomic crises. Historically, private investment in construction[16] represented around 6.0 percent of GDP. As a share of the construction sector, the housing sector did not play an important role, with the exception of a few episodes.

Housing activity in Argentina has reflected the country's *macroeconomic and institutional instability.*. Since 1980, Argentina has undergone three distinct periods. The first one, between 1980 and 1989, was characterized by high inflation, including two hyperinflationary episodes in 1989 and 1990, and stagnant per capita income. This period was known as the "lost decade." During this decade, housing was financed by the National Mortgage Bank, a state-owned entity, and by means of state housing programs, mainly the FO.NA.VI.

The second period, which lasted from early 1991 until 2001, was one of very low inflation rates and wide-ranging economic reforms, leading to episodes of economic growth such as the one in 1995-98. During this period, a currency board was set up, the so-called Convertibility Plan, which dollarized loans and deposits in the banking system. Also, credit to the private sector grew at double-digit rates in real terms and the mortgage market for housing deepened considerably.

Finally, the third period began in 2002 and continues to the present time. After a severe macroeconomic crisis at the end of 2001, the monetary regime changed to one of a floating exchange rate and a more active monetary policy. On average, inflation rates are

[16] There are no official figures on investment in housing. The closest figures are investment in construction by the private sector.

higher than in previous years but lower than in the 1980s. Economic activity rebounded after the 11 percent decline in GDP in 2001, showing an average annual growth rate of 7 percent until 2009. The financial system has not recovered completely since the crisis, and the previous disruption of the mortgage market led to a sharp decline in lending to one-fourth of the level of the 1990s. State-sponsored programs are more active than in previous periods and exceed private mortgage flows. The construction sector played a relevant role in the recovery of growth and contributed to one-third of employment creation. Prices in the housing market evolved, partly reflecting macroeconomic turbulence and partly responding to changes in household formation, availability of urbanized land, and affordability, among other factors.

One consequence of a set of complex factors, such as the importance of temporary income shifts in demand, the high transaction costs, demographic factors and the urban dynamics, is that the dynamics of the housing market respond to external shocks with changes larger than in the case of a well-organized market that includes mortgage lending. These shocks seem to add variability to the usual construction business cycle. Moreover, the result of a negative shock may be uncertain. For instance, greater macroeconomic volatility accompanied by negative real interest rates or confiscatory measures by the government (i.e., bank deposits freezing in the late 1990s or nationalization of pension funds in the 2000s) might push a portfolio change towards more secure assets, including housing. In this context, policies to promote the improvement of housing market operation will need to be broad in scope and rich in alternative instruments to address a wide range of cases.

5. Policy Recommendations and Conclusion

This section identifies and discusses policy options for addressing market and regulatory failures and promoting housing market development in Argentina. We provide a brief description of the policy "toolkit" adaptable for Argentina. We consider the initial conditions of the Argentine setting: damaged credibility of mortgage contracts, shallow financial markets, a volatile business cycle, and high proportion of poor urban households.

Policies to improve the operation of the housing market: Our assessment of the current operation of the housing market in Argentina highlighted several structural characteristics, some important short-run macro problems, and the recurrent pitfalls of social housing policies.

With regard to the *structural characteristics*, most of the urban population is concentrated in a few large metropolitan areas. Urban poverty in large cities is highly associated with a persistent housing deficit. The housing deficit is dominated by qualitative aspects such as deficient construction and over-crowding of housing units.

With respect to the *short-run macro problems* that could prevent the launching of a comprehensive housing policy, two major aspects should be taken into account. On the one hand, the financial market has not fully recovered from the consequences of the 2001-02 crisis, and the mortgage market has lost its appeal due to both the widespread breaches of contract during the crisis legitimized through protective legislation (still in place) and to the lack of long-term financing in the economy. On the other, the annual inflation rate has fluctuated between 20 and 25 percent in the last four years. However, indexation of credit is forbidden for banks, further reducing the availability of long-term loans. To extend the term of credit, banks must increase the interest rate charged on loans which, in turn, reduces the payment capacity of potential borrowers.

Finally, *social housing policies* have been traditionally implemented on the supply side. Particularly after the inception of the National Federal Plans, they have adopted a rather rigid and centralized approach subject to patronage problems and are more oriented to solving employment and activity-level difficulties than to reducing the housing deficit. This situation is not optimal for launching a comprehensive housing policy unless it is conceived within the context of a wider initiative that takes macroeconomic stability aspects into consideration. Moreover, one of Argentina's main problems has been the persistence of the housing deficit. Recent data in the Population Census of 2010 illustrate the increase in housing stock up to a total of more than 14 million units. The 2010-01 increase was around 18.7 percent (provisional data), which is similar to the 2001-1991 increase of 19.5 percent. Considering that population growth slowed down from 11.2 percent to 10.6 percent, comparing the two periods the demographic trend could be operating in favor of closing the housing deficit. Unfortunately, most of the increase in

housing construction accumulated as "vacant houses" (for holiday or week-end use or for non-residential use): around 2 million units in both sub-periods, respectively. This fact, along with the increase in single-member households, suggests that the housing deficit has evolved with no significant changes over the last two decades.

We have estimated that this deficit could be eliminated in a five to eight-year period if policy initiatives aimed at developing the mortgage market and providing social housing are adopted under a decentralized, demand-side, subsidized program (See Annex 2: A Sketch to appraise the feasibility of a comprehensive housing program for urban locations in Argentina). Total investment was calculated for different scenarios and total estimates were obtained, amounting to 6 to 25 percent of GDP, depending on the policy coverage.

However, these calculations are subject to numerous caveats and potential criticism. Among them, we considered two connected to our calculations on demand elasticities and tenure choice (Section 3).

First, not only demographic changes might influence housing demand evolution; changes in long-term income and housing prices will also modify the demand for housing services. For instance, between 1997 and 2009, increases in real income of 2.8 percent annually would have increased housing demand by 21 percent over the period in the absence of changes in other variables affecting demand. Similarly, a sustained increase in real prices in urban real estate of about 3.5 percent over the period would have resulted in a decrease of 28 percent in demand, ceteris paribus. A total combined reduction effect of around -7 percent could have materialized during the 1997-09 period. This sizable net effect could affect the development of a program where subsidies were granted without evaluating the evolution of housing prices.[17] In general, housing programs include initiatives to keep or reduce housing costs and prices.

Second, our estimations on the evolution of the tenure choice suggest that housing demand is affected by the evolution of income and other variables over the life cycle. Thus, the probability of owning a house of good quality grows significantly after the age range of 35-39 years. This fact suggests that a comprehensive program to eliminate the deficit could reduce its fiscal cost by assisting older households in the first place. In our example, the

[17] This is particularly important for demand subsidy schemes which tend to push demand and home prices in the market.

cost of investment in housing units corresponding to younger households (under 40 years old) is around 11.8 percent to 3 percent of GDP according to the housing solution. Postponing access of younger families is equivalent to saving 13.8 percent to 1.2 percent of GDP. These younger households should be encouraged to participate in alternative programs, including saving incentives, until they decide to buy a home or meet the requirements for full access to the housing program.

In summary, these final remarks have attempted to show the importance of a coordinated social housing program to eliminate Argentina's persistent housing deficit and the various components of the design that are subject to changes in demand characteristics and household behavior. As a result, sizable reductions in the cost of housing programs might be achieved.

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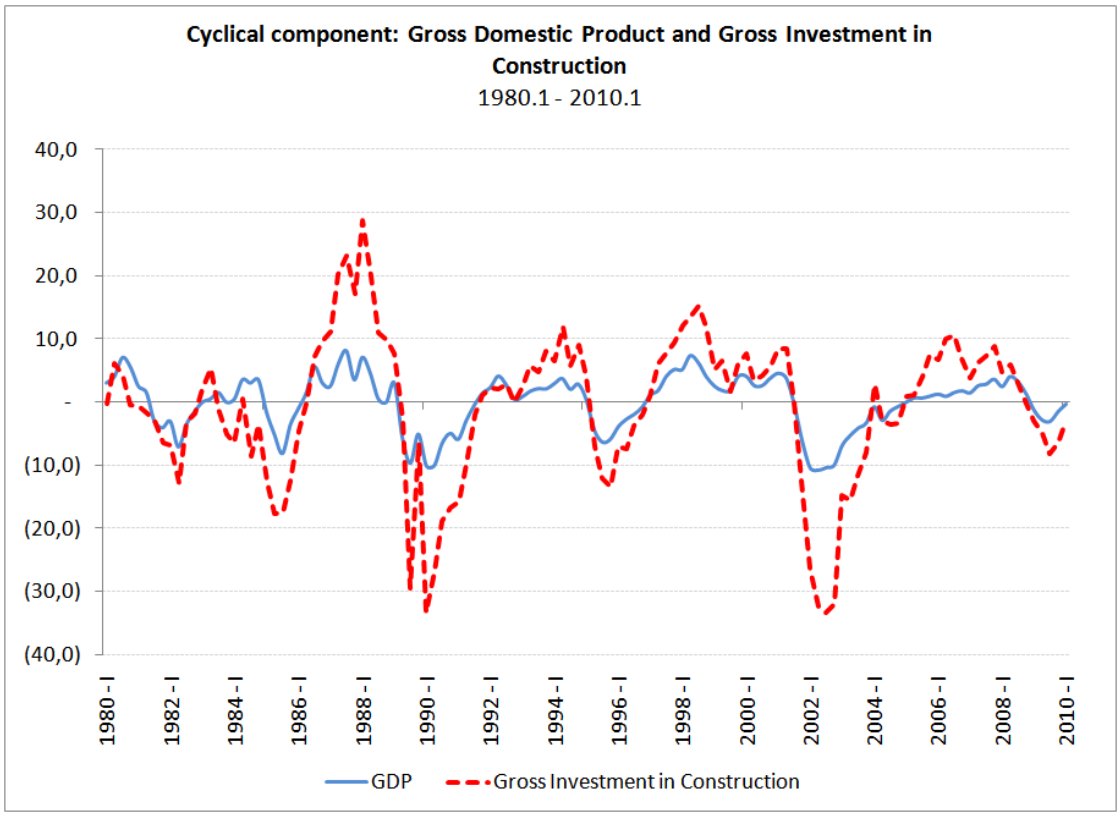
Annex 1.

Figure A1.



Source: Authors' calculations based on National Accounts. Construction includes private and public activity: housing, commercial buildings and infrastructure.

Table A1. Hedonic Price Regressions with Permanent Income

Hedonic Price Regressions with Permanent Income 1/
Regression Coefficients
By Agglomerate

	Capital Federal	Conurbano Bonaerense	Córdoba y La Pampa	Santa Fe y Entre Ríos	Resto de Buenos Aires	Jujuy, Salta y Tucumán	La Rioja, Catamarca y Sgo del Estero	Misiones y Corrientes	Chaco y Formosa	San Juan, Mendoza y San Luis
lningper	0.317 ***	0.182 ***	0.121 **	0.158 ***	0.190 ***	0.186 ***	0.181 *	0.235 ***	0.082	0.258 ***
lnnpiezas	0.215 ***	0.191 ***	0.151 **	0.102 *	0.216 ***	0.058	0.235 **	0.046	0.040	0.180 ***
lncantbano	0.370 ***	0.488 ***	0.077	0.541 ***	0.088	0.357 ***	0.438 **	0.392 **	(0.174)	0.275 ***
lnmiembros	(0.031)	0.005	(0.002)	0.011	0.138 ***	(0.001)	0.229 ***	0.124 *	(0.059)	0.106 ***
redgas	0.725 ***	0.013	0.311 ***	0.152	0.017	0.039	(0.115)			(0.004)
redagua		0.176 ***	(0.162)	0.093	(0.114)		0.552 **	0.799 ***	0.151	(0.025)
red_cloacal		0.023	0.002	(0.014)	0.064	(0.225) *	(0.008)	0.180 **	0.368 ***	0.142 **
electricidad			(0.646) *			1.375 **				
telef	(0.117) *	0.098 **	0.078	0.171 ***	0.189 ***	0.296 ***	0.157	(0.200) *	0.112	0.064
techo_losa	0.277	0.146 **	0.545 ***	0.071	0.125 **	0.226 ***	0.429 **	0.336 ***	0.111	0.173 ***
pared_ladri	0.219	0.019	(0.143)	0.213	0.170	0.732 ***	(0.146)	0.036		0.061
coc_exc	0.230	0.555 ***	0.310 *	0.060		0.611 ***	0.664 ***	0.302 **	0.129	0.046
aire_acond	0.097	0.099	0.160	0.117	0.126	0.262 **	0.155	0.107	0.348 ***	0.151
calefaccion	0.051	0.012	0.066	0.026	(0.019)	0.005	(0.067)	0.120	0.205 **	0.136 **
jardines	(0.140)	0.058	0.060	(0.022)	(0.312) ***	(0.223) ***	0.031	0.013	0.078	(0.110) **
cocheras	0.134 **	0.085 *	0.137 ***	0.071	0.144 **	0.025	0.090	0.210 **	0.117	0.131 **
pavimento	0.042	0.138 **	0.102	0.273 ***	0.108	0.268 ***	0.104	0.246 ***	(0.161)	0.066
transporte			(0.071)	0.142	(0.050)	(1.027) ***	(0.173)		0.105	0.052
_cons	2.019 **	3.203 ***	4.181 ***	3.272 ***	3.651 ***	2.166 ***	2.376 ***	2.009 ***	4.047 ***	2.831 ***
Number of obs	299	278	272	270	311	218	127	125	71	348
Adj R-squared	0.38763	0.4757	0.3556	0.4331	0.359	0.5579	0.4708	0.5114	0.5447	0.4169

1/ Corresponds to a log lineal specification. Endogenous variable: natural log of rents.
(***) Statistically significant at the 1%; (**) statistically significant at the 5%; (*) statistically significant at the 10%.

Table A2. Hedonic Price Regressions without Permanent Income

Hedonic Price Regressions without Permanent Income 1/
Regression Coefficients
By Agglomerate

	Capital Federal		Conurbano Bonaerense		Córdoba y La Pampa		Santa Fe y Entre Ríos		Resto de Buenos Aires		Jujuy, Salta y Tucumán		La Rioja, Catamarca y Sgo del Estero		Misiones y Corrientes		Chaco y Formosa		San Juan, Mendoza y San Luis		Neuquén y Río Negro
lnnpiezas	0.195	***	0.213	***	0.151	**	0.118	*	0.206	***	0.059		0.198	**	0.086		0.005		0.197	***	0.259
lncantbano	0.487	***	0.567	***	0.113		0.604	***	0.139		0.390	***	0.490	**	0.440	**	(0.169)		0.359	***	0.767
lnmiembros	(0.017)		0.012		0.011		0.031		0.175	***	(0.008)		0.262	***	0.113	*	(0.031)		0.133	***	(0.079)
redgas	0.734	***	0.021		0.328	***	0.152	**	0.024		0.037		(0.092)						(0.025)		1.142
redagua			0.192	***	(0.220)		0.079		(0.108)				0.593	***	0.791	***	0.212		(0.020)		
red_cloacal			0.026		0.008		0.017		0.046		(0.195)		(0.010)		0.229	**	0.398	***	0.176	**	0.157
electricidad					(0.406)						1.498	***									
telef	(0.047)		0.128	***	0.129	**	0.183	***	0.213	***	0.302	***	0.191	*	(0.123)		0.136		0.113	**	0.070
techo_losa	0.276		0.170	***	0.563	***	0.092		0.161	***	0.234	***	0.514	***	0.283	***	0.130		0.170	***	0.037
pared_ladri	0.137		(0.022)		(0.192)		0.204		0.271		0.712	***	(0.195)		0.103				0.110		0.472
coc_exc	0.145		0.619	***	0.304		0.097		0.460		0.723	***	0.731	***	0.378	**	0.125		0.196		(0.237)
aire_acond	0.113		0.105		0.134		0.175	*	0.176		0.278	**	0.202		0.159		0.366	***	0.204	*	(0.213)
calefaccion	0.076		0.035		0.062		0.041		0.011		0.047		(0.065)		0.169	*	0.211	**	0.133	*	0.142
jardines	(0.178)	*	0.053		0.061		(0.019)		(0.317)	***	(0.199)	***	0.074		0.003		0.076		(0.082)	*	0.120
cocheras	0.138	**	0.106	**	0.146		0.087		0.154	**	0.066		0.094		0.226	**	0.126		0.133	**	0.009
pavimento	0.075		0.143	**	0.114	*	0.259	***	0.117		0.318	***	0.084		0.265	***	(0.153)		0.123	*	0.216
transporte					0.010		0.090		(0.069)		(0.905)	**	(0.173)				0.091		0.076		0.496
_cons	4.353	***	4.325	***	4.729	***	4.280	***)	4.305	***	2.995	***	3.464	***	3.383	***	4.530	***	4.230	***	2.969
Number of obs	299		279		272		271		314		218		127		126		72		348		186
Adj R-squared	0.1959		0.4521		0.3422		0.4079		0.3439		0.5373		0.4609		0.4745		0.5838		0.3572		0.3989

1/ Corresponds to a log lineal specification. Endogenous variable: natural log of rents.
(***) Statistically significant at the 1%; (**) statistically significant at the 5%; (*) statistically significant at the 10%.

Table A3. Tenure Categories by Agglomerates

Tenure Categories (*) by Agglomerates.
Percentage of total households

Agglomerate	Formal 1	Formal 2	Formal 3	Formal 4	Slum
Gran La Plata	87,7%	87,0%	87,3%	87,0%	1,6%
Bahía Blanca	91,3%	91,3%	91,3%	91,1%	0,1%
Gran Rosario	85,4%	85,4%	84,0%	85,0%	2,2%
Gran Santa Fe	86,8%	86,8%	85,6%	86,8%	0,0%
Gran Paraná	79,9%	79,7%	79,3%	79,7%	1,6%
Posadas	77,0%	77,0%	73,6%	77,0%	7,5%
Gran Resistencia	76,3%	76,3%	72,8%	76,3%	1,1%
Comodoro Rivadavia	84,2%	84,2%	83,7%	84,2%	0,1%
Gran Mendoza	83,2%	83,1%	83,3%	83,0%	2,3%
Corrientes	85,5%	85,5%	84,3%	85,5%	0,9%
Gran Córdoba	86,2%	86,2%	85,5%	86,1%	0,9%
Concordia	79,6%	79,3%	77,5%	79,3%	1,9%
Formosa	84,9%	84,9%	80,0%	84,9%	0,0%
Neuquén - Plottier	90,0%	89,3%	88,6%	89,3%	1,8%
Santiago del Estero	87,8%	87,8%	79,9%	87,8%	0,0%
Jujuy - Palpalá	78,2%	78,2%	73,0%	78,2%	1,0%
Río Gallegos	86,0%	86,0%	84,7%	86,0%	0,0%
Gran Catamarca	90,3%	90,3%	84,3%	90,3%	0,0%
Salta	79,7%	79,7%	74,2%	79,7%	1,0%
La Rioja	85,5%	85,5%	81,5%	85,5%	0,2%
San Luis - El Chorrillo	91,3%	91,3%	88,4%	91,3%	0,0%
Gran San Juan	83,4%	83,4%	80,9%	83,4%	0,0%
Gran Tucumán - Tafi	68,2%	68,2%	64,1%	68,1%	1,7%
Santa Rosa - Toay	93,5%	93,5%	93,3%	93,5%	0,0%
Ushuaia - Río Grande	89,0%	89,0%	89,0%	89,0%	1,8%
Ciudad de Buenos	86,3%	86,1%	86,4%	84,6%	2,5%
Partidos del GBA	82,4%	82,3%	77,4%	82,2%	1,2%
Mar del Plata -Batán	81,8%	81,8%	80,4%	81,8%	0,4%
Río Cuarto	90,7%	90,7%	89,5%	90,7%	1,5%
San Nicolás	85,1%	84,8%	82,7%	84,8%	2,8%
Rawson - Trelew	89,0%	89,0%	87,2%	89,0%	0,0%
Viedma - Carmen	89,2%	89,2%	85,3%	89,2%	0,2%
Total	**83,7%**	**83,6%**	**80,9%**	**83,3%**	**1,4%**

(*) Categories corresponds to:

Formal 1

1 = Owner of the house and the plot or renters

0 = Owner of the house and not of the plot and legal and ilegal tenats

Formal 2

1 = Owner of the house and the plot or renters, not located in slums

0 = Owner of the house and the plot located in slums and Owner of the house and not of the plot and legal and ilegal tenats

Formal 3

1 = Owner of the house and the plot or renters with plumbing facilities and sewarage

0 = Owner of the house and the plot or renters but without plumbing facilities nor sewarage, owner of the house only

Formal 4

1 = Owner of the house and the plot or renter, excluded households located in slums

0 = Owner of the house and the plot or renters and other legal and ilegal tenats located in slums

Slums

1 = Households located in slums

0 = Households located outside slums

Source: Own based on Permanent Household Survey. 2009.

Table A4. Household Characteristics according to House Location and Tenure: Number of Rooms

Tenure / Location	All Locations				Houses exclud. In slums				Houses in slums			
	2003		2009		2003		2009		2003		2009	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Owner of the house and the plot	3.21	1.17	3.24	1.14	3.21	1.17	3.24	1.14	2.77	1.06	2.19	1.26
Owner of the house only	2.23	1.04	2.44	1.03	2.22	1.06	2.47	1.03	2.26	0.98	2.28	1.02
Tenants	2.51	1.13	2.42	1.04	2.52	1.13	2.44	1.04	1.47	0.88	1.39	0.57
Occupant with payments of taxes/other expenses	2.60	1.14	2.61	1.07	2.60	1.14	2.66	1.05	2.08	0.85	1.21	0.45
In house provided by the employer	2.06	1.18	1.85	0.89	2.06	1.18	1.85	0.89	2.00	.	2.00	.
Occupant for free (with permission)	2.28	1.14	2.41	1.09	2.30	1.15	2.42	1.10	1.75	0.88	2.29	0.67
Occupant for free (without permission)	2.19	1.02	2.25	0.98	2.13	1.12	2.12	0.98	2.38	0.63	2.63	0.89
In legal succession	2.98	1.58	3.01	1.08	2.99	1.58	3.02	1.08	1.60	0.60	2.00	-
Another situation	2.76	1.25	2.93	2.31	2.78	1.26	3.07	2.39	2.00	.	1.99	1.51
All	2.94	1.24	2.97	1.19	2.96	1.24	2.98	1.18	2.29	1.04	2.03	1.00

Table A5. Household Characteristics according to House Location and Tenure: Access to Running Water (%)

Tenure / Location	All Locations				Houses exclud. In slums				Houses in slums			
	2003		2009		2003		2009		2003		2009	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Owner of the house and the plot	0.86	0.35	0.88	0.33	0.86	0.35	0.88	0.33	0.88	0.32	1.00	-
Owner of the house only	0.82	0.39	0.88	0.32	0.77	0.42	0.87	0.34	0.94	0.24	0.97	0.18
Tenants	0.92	0.27	0.96	0.19	0.92	0.26	0.96	0.19	0.67	0.47	0.78	0.41
Occupant with payments of taxes/other expenses	0.81	0.39	0.84	0.36	0.81	0.40	0.84	0.36	1.00	-	0.83	0.38
In house provided by the employer	0.84	0.37	0.98	0.15	0.84	0.37	0.98	0.15	1.00	-	1.00	-
Occupant for free (with permission)	0.81	0.39	0.83	0.38	0.82	0.38	0.83	0.38	0.67	0.47	0.76	0.42
Occupant for free (without permission)	0.56	0.50	0.84	0.37	0.48	0.50	0.84	0.36	0.78	0.41	0.83	0.38
In legal succession	0.88	0.32	0.84	0.37	0.88	0.32	0.84	0.37	1.00	-	1.00	-
Another situation	0.82	0.38	0.85	0.36	0.82	0.39	0.90	0.30	1.00	-	0.48	0.50
All	0.86	0.34	0.89	0.31	0.86	0.34	0.89	0.31	0.87	0.34	0.88	0.32

Table A6. Household Characteristics according to House Location and Tenure: Bathroom for Exclusive Use (%)

Tenure / Location	All Locations				Houses exclud. In slums				Houses in slums			
	2003		2009		2003		2009		2003		2009	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Owner of the house and the plot	0.98	0.15	0.99	0.12	0.98	0.15	0.99	0.12	0.91	0.29	0.69	0.46
Owner of the house only	0.87	0.34	0.90	0.30	0.86	0.35	0.90	0.30	0.88	0.32	0.90	0.30
Tenants	0.93	0.26	0.97	0.18	0.93	0.25	0.97	0.16	0.39	0.49	0.53	0.50
Occupant with payments of taxes/other expenses	0.93	0.25	0.90	0.30	0.93	0.25	0.92	0.26	1.00	-	0.21	0.41
In house provided by the employer	0.95	0.21	0.97	0.16	0.95	0.21	0.97	0.16	1.00	-	1.00	-
Occupant for free (with permission)	0.83	0.37	0.88	0.33	0.83	0.37	0.88	0.33	0.80	0.40	0.93	0.25
Occupant for free (without permission)	0.82	0.38	0.78	0.41	0.76	0.43	0.71	0.45	1.00	-	0.98	0.13
In legal succession	0.98	0.15	0.93	0.26	0.98	0.15	0.93	0.26	1.00	-	1.00	-
Another situation	0.76	0.43	0.90	0.31	0.75	0.43	0.96	0.20	1.00	-	0.48	0.50
All	0.95	0.23	0.96	0.19	0.95	0.22	0.97	0.18	0.85	0.36	0.75	0.43

Table A5. Household Characteristics according to House Location and Tenure: Houses with Roof of Good Quality (%)

Tenure / Location	All Locations				Houses exclud. In slums				Houses in slums			
	2003		2009		2003		2009		2003		2009	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Owner of the house and the plot	1.00	0.06	0.99	0.08	1.00	0.06	0.99	0.08	1.00	-	0.96	0.19
Owner of the house only	0.96	0.21	0.98	0.15	0.97	0.18	0.99	0.10	0.92	0.27	0.89	0.31
Tenants	0.99	0.07	1.00	0.06	0.99	0.07	1.00	0.06	1.00	-	0.99	0.12
Occupant with payments of taxes/other expenses	1.00	0.04	0.98	0.13	1.00	0.04	0.98	0.13	1.00	-	1.00	-
In house provided by the employer	0.99	0.07	1.00	0.06	0.99	0.07	1.00	0.06	1.00	-	1.00	-
Occupant for free (with permission)	0.97	0.17	0.97	0.17	0.97	0.17	0.97	0.17	0.97	0.18	0.76	0.42
Occupant for free (without permission)	0.93	0.25	0.99	0.07	0.98	0.14	0.99	0.07	0.78	0.41	0.99	0.08
In legal succession	0.97	0.16	0.99	0.08	0.98	0.15	0.99	0.08	0.83	0.38	1.00	-
Another situation	1.00	-	0.99	0.10	1.00	-	0.99	0.11	1.00	-	1.00	-
All	0.99	0.09	0.99	0.09	0.99	0.08	0.99	0.08	0.95	0.22	0.93	0.25

Roofs of good quality are those with asphalt membrane, tile or metal sheet.

Table A6. Household Characteristics according to House Location and Tenure
Houses with Floor of Good Quality (%)

Tenure / Location	All Locations				Houses exclud. In slums				Houses in slums			
	2003		2009		2003		2009		2003		2009	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Owner of the house and the plot	0.84	0.37	0.85	0.36	0.84	0.37	0.85	0.36	0.61	0.49	0.22	0.42
Owner of the house only	0.30	0.46	0.51	0.50	0.33	0.47	0.54	0.50	0.23	0.42	0.33	0.47
Tenants	0.91	0.29	0.92	0.28	0.91	0.28	0.92	0.26	0.54	0.50	0.41	0.49
Occupant with payments of taxes/other expenses	0.76	0.43	0.77	0.42	0.76	0.43	0.79	0.41	0.57	0.50	0.17	0.38
In house provided by the employer	0.87	0.34	0.92	0.28	0.87	0.34	0.92	0.28	1.00	-	1.00	-
Occupant for free (with permission)	0.58	0.49	0.68	0.47	0.60	0.49	0.68	0.47	0.30	0.46	0.54	0.50
Occupant for free (without permission)	0.17	0.37	0.30	0.46	0.13	0.34	0.27	0.44	0.28	0.45	0.40	0.49
In legal succession	0.77	0.42	0.79	0.40	0.77	0.42	0.79	0.41	0.43	0.50	1.00	-
Another situation	0.81	0.40	0.75	0.43	0.83	0.38	0.73	0.44	-	-	0.89	0.31
All	0.80	0.40	0.83	0.38	0.81	0.39	0.84	0.37	0.38	0.48	0.36	0.48

Floors of good quality are mosaic (tile), wood or carpet.

Table A7. Household Characteristics according to House Location and Tenure
Houses with Ceiling (%)

Tenure / Location	All Locations				Houses exclud. In slums				Houses in slums			
	2003		2009		2003		2009		2003		2009	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Owner of the house and the plot	0.86	0.34	0.87	0.34	0.87	0.34	0.87	0.34	0.67	0.47	0.48	0.50
Owner of the house only	0.42	0.49	0.58	0.49	0.49	0.50	0.63	0.48	0.25	0.43	0.29	0.45
Tenants	0.90	0.29	0.91	0.29	0.91	0.29	0.92	0.27	0.35	0.48	0.18	0.38
Occupant with payments of taxes/other expenses	0.79	0.41	0.79	0.41	0.79	0.41	0.81	0.39	0.89	0.31	0.21	0.41
In house provided by the employer	0.89	0.32	0.92	0.28	0.89	0.32	0.92	0.28	1.00	-	1.00	-
Occupant for free (with permission)	0.64	0.48	0.69	0.46	0.64	0.48	0.69	0.46	0.46	0.50	0.54	0.50
Occupant for free (without permission)	0.26	0.44	0.52	0.50	0.33	0.47	0.55	0.50	0.05	0.22	0.44	0.50
In legal succession	0.77	0.42	0.77	0.42	0.77	0.42	0.76	0.42	-	-	1.00	-
Another situation	0.77	0.42	0.72	0.45	0.79	0.41	0.75	0.43	-	-	0.52	0.50
All	0.83	0.37	0.85	0.36	0.84	0.36	0.85	0.35	0.40	0.49	0.32	0.47

Table A8. Household Characteristics according to House Location and Tenure
Number of Persons per House

Tenure / Location	All Locations				Houses exclud. In slums				Houses in slums			
	2003		2009		2003		2009		2003		2009	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Owner of the house and the plot	3.37	1.90	3.33	1.85	3.37	1.90	3.33	1.85	4.28	2.32	3.90	1.73
Owner of the house only	4.31	2.20	3.98	2.23	4.25	2.12	3.87	2.16	4.48	2.39	4.54	2.51
Tenants	2.89	1.62	2.72	1.50	2.89	1.63	2.71	1.51	2.92	1.10	3.00	0.88
Occupant with payments of taxes/other expenses	3.48	1.56	3.41	1.91	3.46	1.54	3.36	1.89	5.39	2.05	4.73	2.20
In house provided by the employer	3.01	1.56	2.71	1.36	3.00	1.55	2.72	1.36	7.00	.	1.00	.
Occupant for free (with permission)	3.58	2.10	3.40	1.91	3.61	2.09	3.40	1.92	2.78	2.22	3.53	1.47
Occupant for free (without permission)	4.93	2.86	3.82	1.73	4.81	2.92	3.55	1.57	5.30	2.76	4.60	1.98
In legal succession	3.49	1.98	2.95	1.74	3.50	1.98	2.96	1.74	2.41	2.60	1.58	0.60
Another situation	3.24	2.07	3.25	2.11	3.22	2.10	3.46	2.12	4.00	.	1.80	1.57
All	3.34	1.91	3.25	1.84	3.32	1.89	3.23	1.83	4.17	2.37	4.05	2.14

Table A9. Household Characteristics according to House Location and Tenure
Number of Persons per Bedroom

Tenure / Location	All Locations				Houses exclud. In slums				Houses in slums			
	2003		2009		2003		2009		2003		2009	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Owner of the house and the plot	1.77	0.89	1.73	0.85	1.76	0.88	1.73	0.85	2.29	1.16	2.73	1.48
Owner of the house only	2.73	1.49	2.43	1.38	2.75	1.51	2.39	1.35	2.67	1.41	2.68	1.50
Tenants	1.87	0.94	1.79	0.88	1.86	0.94	1.78	0.87	2.60	1.10	2.40	0.74
Occupant with payments of taxes/other expenses	2.22	1.21	2.17	1.25	2.20	1.19	2.10	1.20	3.43	1.61	3.95	1.29
In house provided by the employer	2.23	1.20	2.13	0.93	2.22	1.20	2.14	0.93	3.50	-	1.00	-
Occupant for free (with permission)	2.47	1.56	2.24	1.30	2.50	1.55	2.24	1.31	1.88	1.55	2.18	0.93
Occupant for free (without permission)	2.95	1.76	2.41	1.27	3.05	1.90	2.33	1.18	2.63	1.17	2.65	1.47
In legal succession	2.00	1.15	1.68	0.88	2.01	1.15	1.68	0.88	1.82	0.89	1.54	0.56
Another situation	2.10	0.97	1.91	1.13	2.05	0.93	2.02	1.17	4.00	-	1.12	0.19
All	1.90	1.04	1.82	0.96	1.88	1.03	1.81	0.94	2.49	1.36	2.66	1.39

Table A10. Household Characteristics, Differences between Homeowners and Home Renters, Nationwide Sample

Variable	Owners		Renters	
	Average	Standard Deviation	Average	Standard Deviation
Houses				
Number of bedrooms (#)	3.20	1.18	2.90	1.20
Number of own bathrooms (#)	1.03	0.29	1.04	0.21
Number of bathrooms (#)	1.11	0.65	1.00	0.54
Have plumbing facilities (%)	0.92	0.27	0.93	0.25
Have flush toilet (%)	0.90	0.30	0.92	0.27
Have a kitchen (%)	0.98	0.14	0.97	0.18
Have gas in the kitchen (%)	0.55	0.50	0.51	0.50
Have hot piped water in the kitchen (%)	0.61	0.49	0.55	0.50
Have heating equipment (%)	0.82	0.38	0.78	0.42
Have electricity (%)	0.99	0.07	1.00	0.05
Have a telephone main line (%)	0.59	0.49	0.36	0.48
Have an elevator (%)	0.00	0.04	0.00	0.02
Have a doorphone (%)	0.07	0.26	0.05	0.21
Have a doorman (%)	0.00	0.04	0.00	0.02
Have private security personnel (%)	0.01	0.08	0.00	0.07
Have a garage (%)	0.38	0.49	0.27	0.44
Is it in a multi-unit residential building? (%)	0.05	0.22	0.04	0.20
Apartments				
Number of bedrooms (#)	3.09	1.18	2.38	1.05
Number of own bathrooms (#)	1.02	0.40	1.07	0.46
Number of bathrooms (#)	1.30	0.63	1.05	0.42
Have plumbing facilities (%)	1.00	0.06	1.00	0.06
Have flush toilet (%)	1.00	0.07	1.00	0.05
Have a kitchen (%)	1.00	0.05	0.99	0.11
Have gas in the kitchen (%)	0.93	0.26	0.87	0.34
Have hot piped water in the kitchen (%)	0.94	0.24	0.85	0.36
Have heating equipment (%)	0.93	0.26	0.81	0.39
Have electricity (%)	1.00	0.02	1.00	0.00
Have a telephone main line (%)	0.86	0.34	0.58	0.49
Have an elevator (%)	0.50	0.50	0.51	0.50
Have a doorphone (%)	0.72	0.45	0.67	0.47
Have a doorman (%)	0.41	0.49	0.41	0.49
Have private security personnel (%)	0.10	0.30	0.09	0.29
Have a garage (%)	0.24	0.43	0.16	0.37
1 - Story multi-unit bulding	0.16	0.37	0.22	0.41
2 - Story multi-unit building	0.18	0.38	0.16	0.37
3- and 4-Story multi-unit building	0.19	0.39	0.14	0.35
5- to 10-Story multi-unit building	0.27	0.44	0.31	0.46
More than 10-Story multi-unit bulding	0.20	0.40	0.17	0.37
Is it in a multi-unit residential building? (%)	0.17	0.37	0.07	0.25

Source: Authors' estimates based on ENGH Database.

Table A11. Sample Size: ENGH 96/97

Region	1		2			3		4		5	6		Total
Subregion	Capital Federal	Conurbano Bonaerense	Córdoba y La Pampa	Santa Fe y Entre Ríos	Resto de Buenos Aires	Jujuy, Salta y Tucumán	La Rioja, Catamarca y Sgo del Est	Misiones y Corrientes	Chaco y Formosa	San Juan, Mendoza y San Luis	Neuquén y Río Negro	Chubut, Santa Cruz y T. del Fuego	
Households	1287	3560	2127	2678	2879	2580	2216	1669	1623	3038	1370	1939	**26966**
Houses	325	3069	1938	2393	2515	2364	2138	1499	1541	2737	1174	1656	**23349**
Owners	258	2283	1451	1734	1943	1565	1674	1038	1112	1994	892	1161	**17105**
Renters	33	201	230	232	229	226	143	110	75	297	148	252	**2176**
Renters reported	32	194	218	226	226	224	141	107	72	293	143	251	**2127**
Others	34	585	257	427	343	573	321	351	354	446	134	243	**4068**
Apartments	962	491	189	285	364	216	78	170	82	301	196	283	**3617**
Owners	616	314	59	170	185	134	24	100	47	166	119	171	**2105**
Renters	267	110	97	73	135	62	20	55	22	100	56	91	**1088**
Renters reported	259	106	94	70	134	60	19	52	19	98	54	91	**1056**
Others	79	67	33	42	44	20	34	15	13	35	21	21	**424**

Source: Authors' estimates based on ENGH Database.

Table A 12
EPH: Housing Attributes Surveyed

Attribute	EPH punctual Until 2003	EPH continuous Since 2003
Located near a garbage bump		x
Located in a flooding area		x
Located in a slum	x	x
Number of bedrooms	x	x
Kitchen		x
Have running water	x	x
Have electricity	x	
Bathroom (inside or shared)	x	x
Outer wall material type	x	
Roof material type		x
Ceiling material type		x
Floor material type		x
Overcrowded	x	x

Table A13. Housing Demand Estimations/OLS Complete Results

Housing Demand Estimations 1/
OLS Complete Results 2/

	OLS Model I		OLS Model II	
	Column (1)	Column (2)	Column (3)	Column (4)
	All Households			
Permanent Income	**0.534** (***)	**0.508** (***)	**0.411** (***)	**0.382** (***)
Price	**-0.534** (***)	**-0.538** (***)	**-0.471** (***)	**-0.465** (***)
Positive Temporary Income 3/	**0.031** (***)		**0.036** (***)	
Negative Temporary Income 3/	**-0.010** (***)		**-0.011** (***)	
ln_age	0.196 (***)	0.187 (***)	0.219 (***)	0.209 (***)
gender	-0.053 (***)	-0.048 (***)	-0.065 (***)	-0.060 (*)
marital status	-0.025 (***)	-0.019 (**)	-0.021 (**)	-0.014 (**)
Number of obs	20299	20299	20299	20299
Adj R-squared	0.4201	0.3531	0.2965	0.2092
	Owners			
Permanent Income	**0.517** (***)	**0.501** (***)	**0.372** (***)	**0.353** (***)
Price	**-0.533** (***)	**-0.544** (***)	**-0.454** (***)	**-0.458** (***)
Positive Temporary Income 3/	**0.028** (***)		**0.033** (***)	
Negative Temporary Income 3/	**-0.005** (**)		**-0.005** (**)	
ln_age	0.143 (***)	0.124 (***)	0.149 (***)	0.127 (***)
gender	-0.028 (***)	-0.024 (***)	-0.037 (***)	-0.033 (***)
marital status	-0.061 (***)	-0.060 (***)	-0.063 (***)	-0.063 (***)
Number of obs	16940	16940	16940	16940
Adj R-squared	0.4498	0.3982	0.2786	0.2017
	Tenants			
Permanent Income	**0.663** (***)	**0.573** (***)	**0.649** (***)	**0.554** (***)
Price	**-0.522** (***)	**-0.402** (***)	**-0.513** (***)	**-0.364** (***)
Positive Temporary Income 3/	**0.055** (***)		**0.054** (***)	
Negative Temporary Income 3/	**-0.035** (***)		**-0.036** (***)	
ln_age	0.032	0.090 (***)	0.034	0.092 (***)
gender	-0.105 (***)	-0.075 (***)	-0.105 (***)	-0.075 (***)
marital status	-0.018	0.010	-0.013	0.017
Number of obs	3359	3359	3359	3359
Adj R-squared	0.4126	0.2573	0.398	0.2402

1/ Corresponds to a log lineal specification. Endogenous variable: natural log of rents. Model I corresponds to the hedonic price estimations with Permanent Income. Model II corresponds to the estimations without Permanent Income.

2/ Elasticities estimated except for the variables gender and marital status.

3/ Corresponds to income plus 1, to avoid the indefinition of the natural log.

(***) Statistically significant at the 1%; (**) statistically significant at the 5%; (*) statistically significant at the 10%.

Table A14. Heckman Selection Model

Heckman Selection Model 1/

	Owners Column (1)	Tenants Column (2)
Housing Demand (ln H)		
Permanent Income	**0.503** (***)	**0.714** (***)
Price	**-0.531** (***)	**-0.508** (***)
Positive Temporary Income 3/	**0.028** (***)	**0.050** (***)
Negative Temporary Income 3/	**-0.004** (**)	**-0.036** (***)
ln_age	0.070 (***)	-0.262 (***)
gender	-0.017 (**)	-0.083 (***)
marital status	-0.081 (***)	-0.113 (***)
Number of obs	22,152	22,152
Censored	5,481	18,814
Uncensored	16,671	3,338
Wald chi2	13,133	4,387
Prob > chi2	-	-
Select		
Permanent Income	-0.043	0.272 (***)
ln_age	1.653 (***)	-1.793 (***)
gender	-0.102 (***)	0.035
marital status	0.319 (***)	-0.213 (***)
lnmembers	0.226 (***)	-0.465 (***)
lnaedu_jefe	0.526 (***)	-0.079 (*)
_cons	-6.925 (***)	4.713 (***)
Mills ratio		
Lambda	-0.133 (***)	0.227 (***)

1/ Two steps Heckman (1979) estimators. Regression model with sample selecction. Hedonic price estimations with Permanent Income.

2/ Elasticities estimated except for the variables gender and marital status.
(***) Statistically significant at the 1%; (**) statistically significant at the 5%; (*) statistically significant at the 10%.
3/ Corresponds to income plus 1, to avoid the indefinition of the natural log.

Table A15. Current Tenure Choices

	Current Tenure Choices					% Good Quality		
Agglomerate	**Owners (1)**	**Renters (2)**	**Owners LQ (3)**	**Renters LQ (4)**	**Others (5)**	**Owners (6) =(1)/(1)+(3)**	**Renters (7) =(2)/(2)+(4)**	**(7)/(6)**
Gran La Plata	0.445	0.172	0.236	0.058	0.089	0.653	0.746	1.142
Bahía Blanca - Cerri	0.549	0.218	0.116	0.030	0.086	0.826	0.877	1.063
Gran Rosario	0.530	0.144	0.178	0.044	0.103	0.748	0.767	1.025
Gran Santa Fe	0.506	0.162	0.212	0.036	0.084	0.705	0.819	1.162
Gran Paraná	0.412	0.161	0.271	0.033	0.123	0.603	0.831	1.378
Posadas	0.443	0.118	0.275	0.039	0.126	0.617	0.752	1.218
Gran Resistencia	0.446	0.090	0.356	0.014	0.094	0.556	0.868	1.561
C. Rivadavia-Rada Tilly	0.437	0.156	0.247	0.065	0.094	0.638	0.705	1.104
Gran Mendoza	0.510	0.130	0.161	0.057	0.142	0.760	0.695	0.914
Corrientes	0.282	0.157	0.403	0.060	0.098	0.412	0.722	1.753
Gran Córdoba	0.425	0.195	0.186	0.083	0.110	0.695	0.700	1.007
Concordia	0.417	0.105	0.325	0.031	0.122	0.562	0.771	1.372
Formosa	0.537	0.058	0.295	0.017	0.094	0.646	0.777	1.203
Neuquén - Pplottier	0.512	0.154	0.215	0.046	0.073	0.704	0.772	1.096
S. del Estero - La Banda	0.440	0.030	0.479	0.014	0.037	0.479	0.674	1.409
Jujuy - Palpalá	0.457	0.066	0.235	0.074	0.169	0.661	0.471	0.712
Río Gallegos	0.354	0.238	0.147	0.139	0.122	0.707	0.631	0.893
Gran Catamarca	0.487	0.060	0.324	0.043	0.086	0.600	0.584	0.973
Salta	0.295	0.123	0.308	0.098	0.177	0.489	0.557	1.138
La Rioja	0.374	0.100	0.334	0.055	0.137	0.529	0.646	1.221
San Luis - El Chorrillo	0.574	0.119	0.181	0.043	0.083	0.760	0.737	0.969
Gran San Juan	0.463	0.053	0.279	0.056	0.150	0.624	0.483	0.774
Gran Tucumán - Tafí Viejo	0.305	0.151	0.354	0.035	0.154	0.463	0.811	1.751
Santa Rosa - Toay	0.555	0.220	0.116	0.046	0.063	0.828	0.826	0.998
Ushuaia - Río Grande	0.554	0.214	0.141	0.057	0.035	0.797	0.790	0.991
Ciudad de Buenos Aires	0.529	0.206	0.100	0.060	0.105	0.841	0.773	0.919
Partidos del GBA	0.400	0.063	0.343	0.055	0.139	0.538	0.535	0.995
Mar del Plata - Batán	0.514	0.156	0.132	0.034	0.164	0.796	0.821	1.031
Río Cuarto	0.525	0.217	0.131	0.064	0.063	0.800	0.772	0.965
S. Nicolás–V. Constitución	0.580	0.099	0.161	0.035	0.125	0.783	0.736	0.940
Rawson - Trelew	0.551	0.141	0.158	0.045	0.106	0.777	0.757	0.975
Viedma-C. de Patagones	0.491	0.107	0.289	0.049	0.064	0.630	0.684	1.086
Total	0.447	0.122	0.254	0.054	0.122	0.638	0.693	1.088

Source: Based on EPH 2009.

Annex 2. An Exercise to Appraise the Feasibility of a Comprehensive Housing Program for Urban Locations in Argentina

The consideration of an ambitious exercise for the housing market is useful to shed light on the main constraints of its operation. In this sense, our exercise has to be interpreted as an exploratory approach intended to analyze the scope and the limits of public intervention, identify the main variables involved in the making of the policy, and characterize the market actors to be engaged in a future development of a housing program.

Comprehensive housing policy exercise: The objective of the program is to reduce to a minimum the total housing deficit and to serve entrant households in order to keep future housing deficiencies under control at a low level. At the same time, the program should also broaden middle-income families' access to mortgage loans.

Policy initiatives are mainly aimed at reactivating the mortgage market and to providing social housing solutions under a decentralized, demand-side subsidized program. Our exercise will provide information on the size of the potential market to be compared to the current one and the relative importance of the main constraints (loan terms vs. housing unit costs; cost of subsidies vs. population coverage, etc).

The exercise proceeds as follows (See Table A18):

- The housing deficit is broken into its quantitative and qualitative components and corresponding households are identified by tenure and total income.
- A flow of new entrant households per year is estimated based on demographic data.
- Three prototype housing solutions are defined and their costs are estimated: a) housing unit of 50 sq meters including plot, b) idem excluding plot, and c) repair and expansion of housing unit.
- Financing of housing solutions are estimated under two modalities: a 12 year mortgage loan at 5 percent annual interest rate and a 30 year mortgage loan at 5 percent interest rate.

Our results focus on the total cost of investment in housing, the economic cost of the public intervention, the annual public funding needed for the program, and population

coverage. Four scenarios are computed. The first one combines shorter-term loans with full housing solution (housing unit plus plot); the second one includes only housing unit costs; the third and fourth ones extend the loan term to 30 years for the corresponding preceding cases. In each scenario, subsidy percentage on the loan is computed in order to maintain the household above the poverty line.

Notice that the social housing program is implemented through subsidies to the families that complement loan repayment pari passu, i.e., households and local housing authorities are both responsible for the repayment of the loan to the bank. In this sense, the bank's participation is included in order to reduce delinquency rates and to recreate the mortgage market in the long run through gaining scale and promoting private investor participation in new long-term funding at the pace that trust is rebuilt for the market.

Government participation as a co-debtor may appear as dysfunctional and costly in a demand-side, market-oriented proposal for housing policy. However, in the Argentine case, the disruption of the market caused by the government during the last crisis and the recurrent episodes of financial confiscation (including the nationalization of private pension funds) call for a major involvement of the government in securing the rule of law in these types of long-term contracts. An alternative could be to provide each family with a voucher for the whole amount of the subsidy, like in the Chilean standard model. Under the latter modality, coverage would be lower per year, and full recovery of the rule of law with respect to mortgage loan contracts should be provided from the beginning.

Naturally, both options could be available so that borrowers and banks could voluntarily enter any of them. Some incentives could be included in order to allow the system to converge to the less expensive solution (ideally, reducing government involvement in financing in the long run). Initially, the only long-term financing available in the economy is the National Pension Sustainability Guarantee Fund, which may be invited to participate as a long-term lender to this system in competition with alternative investment opportunities. The cost of the subsidy should be paid from current resources of the Fiscal Budget. The allocation of funds to the provincial and municipal housing authorities should be done under transparent mechanisms, including, among others, urban development plans, bidding mechanisms, and matching funds or the provision of urbanized plots.

The following table summarizes the results.

Table A16.Housing Program Costs

Housing Deficit (Households 2,454,396)					
		Scenario 1	**Scenario 2**	**Scenario 3**	**Scenario 4**
Investment in housing	Millons of AR$	350,072	216,699	342,307	54,271
	As % of GDP	25.7	15.9	25.1	4.0
Economic Cost	Millons of AR$	265,874	94,956	177,395	10,095
	As % of GDP	19.5	7.0	13.0	0.7
Annual Financial Cost	Millons of AR$	22,156	7,913	5,913	337
	As % of GDP	1.6	0.6	0.4	0.0
Mortgage (average amount)	AR$	189,961	120,256	275,642	174,496
Served Households		2,454,396	2,399,959	2,399,959	601,054
New Households (155,000 yearly)					
		Scenario 1	**Scenario 2**	**Scenario 3**	**Scenario 4**
Investment in housing	Millons of AR$	17,687	8,398	13,266	5,601
	As % of GDP	1.3	0.6	1.0	0.4
Economic Cost	Millons of AR$	14,188	5,862	12,329	4,217
	As % of GDP	1.0	0.4	0.9	0.3
Annual Financial Cost	Millons of AR$	1,182	488	411	141
	As % of GDP	0.09	0.04	0.03	0.01
Served Households		124,006	93,008	93,008	62,031

Scenario 1: corresponds to the value of the house and grounds with funding to 12 years.
Scenario 2: corresponds to the value of the house only with funding to 12 years.
Scenario 3: corresponds to the value of the house and grounds with funding to 30 years.
Scenario 4: corresponds to the value of the house only with funding to 30 years.

The main lessons of this exercise for future policy design are the following:

- Under the current inflation rate, recreating the mortgage loan market is not possible unless some level of indexation is admitted or the inflation rate is drastically diminished. Neither long-term funding for loans nor payment capacity by borrowers can evolve satisfactorily in the present scenario.
- Initial long term funding, especially for the social housing policy component, may be provided by the National Pension Fund. Once the system acquires some level of consolidation, the capital market should recover its role in funding part of the system through, for instance, *cédulas hipotecarias*, a kind of mortgage secured financial instrument already in use in Argentina.
- The amount of investment required to eliminate the total housing deficit is three to four times the annual investment in total housing construction.

Consequently, the social housing program should be developed over time. Annual financing of subsidies to repayment loans adds a constraint to the viable time schedule of the program. Five to eight years could be a plausible time schedule depending on coverage and investment costs.

- Housing costs are more binding in determining the cost of the program than the term of the mortgage loan. This fact underscores the importance of decentralizing the program in order to reduce costs by adapting the solutions to real needs, mobilizing local authorities to provide urban solutions and available plots at low or zero cost.
- The term of the mortgage loan is important to determine the annual cost of the subsidy, since lower monthly payments allow more households to repay without the risk of falling below the poverty line or the need for additional subsidies.
- Total population coverage is similar in the first three scenarios but falls dramatically in the fourth one, indicating that marginal incentives to the construction companies to increase productivity and a gradual extension in the term of the mortgage loan due to the consolidation of the private mortgage market could rapidly contribute to a reduction in the fiscal cost of the social program.
- Coverage of entrant households does not present a sizable problem once the mortgage market is in place and fully functioning. In the meantime, this cost should be added to the annual cost of the program to reduce the existing deficit.
- Finally, households owning or renting a standard dwelling may choose to acquire, expand, or improve their property using credit. Private sources have estimated that admitting loan indexation would allow the entrance of more than a million households to the credit market. Other aspects of the loan contract may also require reconsideration to expand access. However, many of them had already been reformed in the 1990s (admission of self declaration of income; reduction of down payment, increase of loan-to-value ratios, etc).