

# The Impact of Social Housing Program on the Demand for Housing in Turkey: A Cross-Section Analysis

Abuzer Pınar<sup>1</sup> & Murat Demir<sup>2</sup>

<sup>1,2</sup>Harran University, Faculty of Economics and Administrative Sciences, Şanlıurfa, Turkey.

Correspondence: Abuzer Pınar, Harran University, Faculty of Economics and Administrative Sciences, Osmanbey Kampüsü, Şanlıurfa, Turkey.

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## Abstract

This paper analyses the demand for housing in Turkey, incorporating public housing provision. The housing provision by Housing Development Administration of Turkey (HDA-the original name is Toplu Konut İdaresi-TOKİ) has been argued whether it effectively provides social housing for the poor. The question has been investigated by a model of demand for housing. A model of housing is established, wherein the demand for housing is assumed to be a function of income, price and population. Foreigners' demand and the ratio of mortgage credits have been included as explanatory variables. To test the impact of housing provision by HDA, the ratio of total houses provided by HDA has been included in the model. The model has been tested by provincial-based data. The results show that the regional income and wealth, population, and foreigners' demand have positive impact, and the price has negative impact on the demand for housing, while the mortgage loans appeared to be insignificant. Public housing towards low-income groups does not create any impact on the housing market, while the ones targeting middle-income groups seem to substitute 15% of market supply. The originality of this paper is twofold: Firstly, the paper establishes an original model to analyse the demand for housing in Turkey. Secondly, the impact of HDA housing is of value to analyze to what extent the Agency is a vehicle for social housing.

**Keywords** Turkey, Social housing programs, Public housing provision, Demand for housing

## 1. Introduction

Housing sector is of importance in terms of economic, social and financial aspects in all economies, and particularly in developing countries due to huge demand for houses as a basic need and an instrument for wealth accumulation (Coşkun, 2010; OECD, 2011). On the other hand, low income groups may face serious difficulties to access adequate houses, and a role may be unavoidable for governments to intervene in the housing sector. Governments in many developed and developing countries implement public housing programs in which houses are either owned or allocated by a public body (Chen *et al.*, 2014; Sengupta, 2015). Such a policy is employed either as an expansionary economic policy or as a social program to increase the living standard of the poor. This intervention may be a policy formulation such as the regulation of the mortgage market or subsidized interest rates. A step further is the direct government intervention to provide adequate accommodation for citizens on low prices or rents.

Government intervention in housing sector sometimes appears as direct house provision, and sometimes by indirect instruments such as tax incentives, adequate mortgage credits programs, zoning plans, and provision of low cost building materials. In the developing countries such public policies have important implications both for producers and buyers in housing sector (Quigley, 2006).

Housing policy is a controversial issue as governments may intervene in the sector as a social policy tool to provide accommodation for poor or the intervention may take place as an economic issue to correct market failure. So, two main views are to be considered in terms of housing sector: First is that housing may be regarded as an economic or investment good (Tse *et al.*, 1999). Secondly, housing may be viewed as a social good as a vehicle to satisfy accommodation needs of people (Davidson, 1999). The first approach would require least intervention whereas the second may force more radical intervention, depending on the rate of poverty (Olotuah and Bobadoye, 2009). The more important issue is that a public housing policy should be clear in target. Housing policy ought to be inspected whether it targets the poor, and if so, whether it creates any distortion in the housing market.

A justification for publicly provided housing would be its real effect on economic units. If the public housing programs simply transfer resources to the units that would be housed even in the absence of such a program, then the program should be regarded as wasteful and ineffectual. This is a type of crowding out effect well-known in economics. Most of the literature on this field is related to the US cases, analyzing the housing programs mainly implemented in 1960s and 1970s. Some recent articles investigate the impact of public housing programs in Korea, Hong Kong, and China.

A case study of US found that on average three government-subsidized units displace two units that would otherwise have been provided by the private market. It was also found that there was less crowd out in more populous markets, and more crowd out in places where there is less excess demand for public housing (Sinai and Waldfogel, 2005). Rental and homeownership units in the public sector constitute 50 percent of the entire housing stock in Hong Kong. Wong (2002) argues that the massive redistribution of housing resources did not improve inequality in Hong Kong, because the public sector housing policy failed to target scarce public resources at the lowest income segments. An empirical analysis for Korea shows that public and private housing investment Granger-cause each other with an asymmetric pattern; and the crowding-out effect rises with the housing availability ratio; it grows rapidly as the housing availability ratio gets closer to 100% (Lee (2007). Chen and Nong (2016) examines why and how public housing provision may affect the supply of market-based housing in urban China. Their empirical results show that the supply of public housing has moderate crowding-out effect on the supply of market housing in China, and the crowding-out effect varies substantially under different scenarios.

The housing sector in Turkey faces serious difficulties due to rapid urbanization as other similar industrializing countries. Wage level makes it difficult for people to cope with high rents and house prices. The mortgage system does not work due to low income level, and long-term credits are not provided (Yetgin and Lepkova, 2007). In fact, mortgage system is an effective way to cope with the financial bottle-neck in housing sector, and the mortgage law created high expectation in public.<sup>1</sup> However, high inflation rates, high and volatile interest rates, vulnerability of financial markets and macroeconomic indicators did not allow an efficient implementation of the system. The interest rates in the developed countries are much below unity, and inflation rates are quite low. Unless this problem is somehow solved, the industrialization process will face serious constraints. Public policies towards housing sector are of importance in this sense. Social housing is a way to cope with this housing shortage.

In this paper, we construct a demand model for housing incorporating public housing provision. The determinants of demand for housing vary according to incentive for owning a house (De Leeuw, 1971; Shiller, 2007; Watson, 2013). Given that housing is a basic need for dwelling, the population growth would directly increase the demand for housing. Depending on the environment and quality of houses, the income and prices naturally affect the demand, however, being a basic need, the income and price elasticity are not expected to be high (Lee and Kong, 1977; Glindro *et al.*, 2011). It should be noted that as household incomes rise, people tend to move to better dwellings. Also as an instrument for wealth accumulation, interest rates, the gains from alternative saving instruments, and tastes would also affect the housing demand.

The rest of the paper is as follows: Section 2 provides an overview of the housing sector in Turkey. Section 3 constructs a model of demand for housing, while the data and empirical analysis are presented in section 4. Some conclusions and further research are discussed in the last section.

## **2. An Overview of Housing Sector in Turkey**

High rates of population growth and urbanization lead the increasing demand for housing in Turkey. Apart from population growth rate and urbanization, there are some other reasons behind the increase in the demand for housing. The shortage of regulated lands seems to be an important constraint on the production of housing. Also the inadequate mortgage credits, unemployment, problems with income distribution, per capita income level are other factors creating pressure on housing supply.

There is not much to say for social housing in the period started from 1950 to 2000. This period can be characterized by rapid urbanization, and hence the regulation for housing are not sufficient and the existing legal framework has not been implemented sufficiently. The problem was mainly the insufficient housing in this period (Yetgin and Lepkova, 2007). The need for housing led people to live in slums, majority were in illegal status. After the 2000s, the problem has been put as low quality houses, rather than the supply shortage. Housing Development Administration of Turkey (HDA-TOKİ in Turkish) has been concentrated on the housing supply for the middle- and low-income groups.

Political stability is as important as economic stability in the development of housing sector (Ören and Yüksel, 2013). Turkey faced a massive financial crisis in 2001: more than 20 banks failed, thousands of companies closed down, the unemployment increased, and budget deficits reached to about 14 percent of GDP. Structural reforms in the aftermath of

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<sup>1</sup> Mortgage Law No 5582, 06 March 2007.

2001 crisis changed the risk perception in Turkey. Global investors have been more interested in Turkey, and the banks had the opportunity to provide more funds for housing sector. The mortgage loans have increased by about 7% in the period 2003-2005, and the house-related debts increased by about 50%. The expansion of funds in the era after the 2001 crisis provided opportunity for mortgage loans as well. The demand for housing and the prices rose.

The earthquake took place in 1999 provoked the debates in housing sector. The houses without building permit or the “fixed” permits, and the corruption in construction due to lack of audit, inspection have been subject to tempered debates. Also, the financial crises in 2001 in Turkey (and the 2008 global crisis) showed that the mortgage system can be quite vulnerable, as the households might not be able to pay mortgage installments (Coşkun, 2011).

The cultural transformation also affects the housing market. Rapid growth in population, urbanization (many cities exceed 1 million) increase the gap in housing sector. There is an increasing tendency in atomic family; youngsters leave their family in early ages (due to personal freedom, education, work etc.) increase the demand for housing. The housing supply in Istanbul and the coasts may have been come to a threshold; however there is a supply shortage in other rapidly growing cities. The public policies towards housing thus are of importance.

The housing stock in 2000 is about 16 million according to the Turkish Statistical Institute (TSI), about 84% in urban areas. About 33% has occupancy permit. In the period 2001-2013, about 5,5 million houses have been constructed by building permit. Since 2006, 500 thousands houses have been constructed every year. The fluctuations in exchange rates and rise in interest rates decreased the construction by about 20% in 2011, and this has slightly increased in 2012, and rose in the following years again by about 79%. This rise came through by the decreased cost of finance, and the expected increase in VAT on new houses. Thus, there seems to be about 22 million houses at the time being. The demand for housing is expected to rise, as the population over 30s is expected to rise from 38,8 million in 2013 to 47,1 million in ten years’ time. Hence, the number of houses is expected to rise to over 25 million, and the expected increase in the demand for housing is about 450 thousands annually on average. Some estimates are even higher. GYODER expect the need for extra housing by 7,7 million, which means 700 thousands extra houses every year (Smith, 2012).

About 24% of house purchases took place in Istanbul, 15% in Ankara, and 7% in İzmir in the period 2008-2012. The purchase of foreigners rose about 9% annually in the past decade. Istanbul is expected to be among the most preferred metropolitan in Europe. Meanwhile, the prices in housing sector rose about 10% annually due to the interest rates decline and VAT increases. The correlation between house prices and rents is about 0.99.

The ratio of mortgage loans to GDP is about 5,6% and 6% respectively in 2011 and 2012. This ratio is about 52% in EU-27. The ratio of mortgage loans to the households’ total loans is about 50% (50% in 2006, and 45% in 2013). The ratio has decreased in the aftermath of the 2008 global crisis. The government declared rent subsidy for 18 months and lower rate interest for homeowners particularly in the earthquake areas. However all those partial policy implementations are not enough to fuel the mortgage loans because of the volatility in economic indicators and low ability to pay compared with the monthly installments.

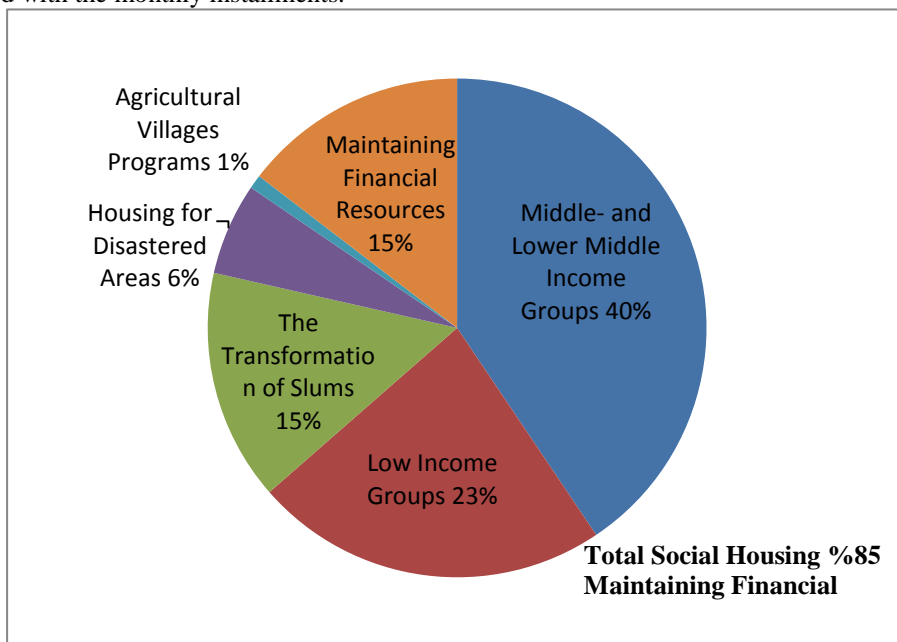


Figure 1. The Implementations by HDA in Turkey (2002-2014)

The performance of HDA in Turkey in the period of 2002-2014 is as follows: 631,141 thousand houses has been provided; about 23% for poor, 40% for middle- and lower-middle income groups, 15% for the transformation of slums, 6% for disaster areas, and 1% for agricultural villages programs. So, the ratio of social housing is about 85%. The rest (15%) consists of houses produced to maintain financial resources, and those are mainly provided to high income groups. This makes a sizable portion compared with the period 1984-2001; only about 43 thousands houses produced and credit support given to cooperatives (TOKİ, 2014).

The construction and housing sector is also important for macroeconomic performance. The share of government in the housing sector investments is about 2,4% after 2010, and the ratio of housing investment in total public investment is above 11%. The sector provides sizable employment, as the share of employment in the construction sector is about 7,4%. The ratio of housing in the construction sector is 75% in the period 2005-2014.

Table 1. The Ownership of Housing in EU and Turkey

	Owned %	Rented %	Social Houses %	Total Social Houses
Netherlands	54	11	35	2 400 000
Austria	55	20	25	800 000
Denmark	52	17	21	530 000
Sweden	59	21	20	780 000
UK	70	11	18	3 983 000
France	56	20	17	4 230 000
Ireland	80	11	8	124 000
Germany	46	49	6	1 800 000
Hungary	92	4	4	167 000
Turkey*	67	26	2	536 649

Source: Whitehead and Scanlon (2007: 9), and TÜİK (2013).

\*The social houses in Turkey include the provision by HDA in the period 2002-2014.

Compared with the EU countries the ratio of tenants in social houses is quite low in Turkey. Housing and rents account for about 27% of total household consumption spending in the period 2002-2013. Despite that, a ratio below 30% seems to be acceptable compared with the average of other countries, given the low per capita income, this ratio is high.

According to TÜİK report on population and housing, about 67% of households live in their owned properties, 24% in rented houses, 1,5% in free quarters (apartments provided for public officials). About 7% of the population do not own a house but do not pay rent (probably live in the houses belonged their families or relatives). The ratio of renters is highest in Istanbul by 31,5% (TÜİK, 2011). The ownership is high compared with the average developed countries; 41% in Germany, 60% in Japan, and 68% in USA for instance (Proxenos, 2001). The ownership is higher than countries with high per capita income and well-organized mortgage systems. This may be due to the quality of housing and building costs. It should also be noted that the rising availability of mortgage loans could increase house prices tremendously and hence decrease the affordability of houses. Also the size of households is quite different (individuals per households 3,8 in Turkey, 2,2 in Germany, and 2,5 in USA).

### 3. Model of Demand for Housing

The importance of housing sector is twofold: One is that housing is an essential need for households, and if so, the demand for housing is expected to rise with population increases, and it would be expected that the demand for housing is income and price inelastic. However, as the quality and environmental characteristics of houses may differ, then as the income level rise, people prefer to move to better houses. Also, as the house prices decline, people would tend to change houses. On the other hand, house as an important component of real estate, may be a saving instrument, depending on the economic environment (see Megbolugbeet *al.* (1991) for a theoretical discussion).

Based on the abovementioned framework, and following a similar approach by Lee and Kong (1977) and Goodman (1988), let  $D_h$  be the demand for housing, a log-linear model of demand for housing can be formulized as follows:

$$D_h = e^\alpha Y^\beta P^\theta N^\pi \quad (1)$$

where  $Y$ ,  $P$ , and  $N$  represent income, house prices, and population respectively. Taking natural logarithm of (1), and adding a set of taste variables ( $Z_i^{ii}$ ,  $i=1, 2, \dots, n$ ) and an error term, the model will be as follows:

$$\ln D_h = \alpha + \beta \ln Y + \theta \ln P + \pi \ln N + \sum_i^n \lambda_i Z_i + u \quad (2)$$

The coefficients in (2) represent the elasticities of demand for housing:  $\alpha$  is the constant term,  $\beta$  is the income elasticity,  $\theta$  is the price elasticity,  $\pi$  is the impact of population on the demand for housing. The demand for housing may be affected by some other variables, such as households' tastes, interest rates, extra demand by foreigners, and public housing policies.

Equation (2) may be estimated by time-series (Lewis-Bynoe *et al.*, 2008; Halicioğlu, 2005; Lebe and Akbaş, 2014), cross-sectional data (Leeuw, 1971) or household-based micro data (Alkay, 2008; Onder, 2010). The income may be the current real income, while in time-series analysis the permanent income is also considered (Attanasio *et al.*, 2010). The house prices also may vary in time, and the house price indices may be above or under the average price level in the economy (Özsoy and Sahin, 2009). The price bubbles are usually tested in such a case.

The taste variables are unavoidably chosen according to the estimation method. For instance, a time-series data for a country cannot include personal tastes, as the data are aggregated. On the other hand, the interest rate will be implicitly included in the constant term in a cross-sectional analysis if the interest rate is the same in all the regions of a country.

### 3.1 Data and Empirical Evidence

The data used in this study is mainly from the Turkish Statistical Institute (TSI) in 2013. TSI publishes the data on the house sales on the provincial base. The data on population and regional value-added is also available. The data for social housing are collected from the Housing Development Administration of Turkey (HDA). The data on prices are only available at macro level as a housing sector price index, but it is not available either on average or as an index on the provincial or local base.<sup>2</sup>

The housing price data for provinces was collected from various advertising sources from internet. This data covers 1730 cases including 59 provinces. It should be noted that those prices are "ask prices", and it is assumed that the structure of the price data does not change even if the houses sold on a bargaining process. The average of the provinces is computed and an average price is determined for each province. The median has also been tested in the model.

The raw data included prices for flats and self contained houses. However, the range of prices for self-contained houses appeared to be very high. This is because all villa and slums are considered to be self contained houses, despite that those two types of houses are quite different in appliances and prices. So, the self-contained houses were excluded from the data. The data used in this study includes flats only. The data collected from İstanbul, Ankara, and İzmir each consists about 10% of the total sample (there consists about 30% of the whole). Those provinces were followed by Bursa, Trabzon, Manisa, Malatya, Tekirdağ, Aydın, Antalya, Bilecik and Mersin. The average price of flats in Turkey in the last quarter of 2013 is about 175,000 Turkish lira (about 60,000 dollar), and the median is 145,000 Turkish lira. The average size of flats is about 140 m<sup>2</sup> (4 rooms on average). The average age of apartments is about 8 years

Table 2. Descriptive Statistics

	Mean	Median	Std. Dev.	Minimum	Maximum
D <sub>h</sub> (house purchase)	18.690	8.487	35.646	369	234.789
Y (regional value-added)(Thousands)	38.847	28.047	41.913	7.685	312.438
IW(Income&Wealth)	0.43	0.45	0.165	0.02	0.88
P (house prices)	151.008	141.000	44.079	82.400	289.000
N (population)(Thousands)	1.180	707	1.947	76	14.160
F(purchase by foreiners)	201	0	802	0	5548
M <sub>h</sub> (Purch. by mortgage)	0,36	0,36	0,07	0,22	0,48
S <sub>h(total)</sub>	0,405	0,176	0,918	0,000	6,595
S <sub>h(low-income)</sub>	0,122	0,092	0,114	0,000	0,498

As seen in Table 2, about 18 thousand houses were purchased on average. Maximum sales have taken place in İstanbul, the biggest metropolitan city by over 14 million populations. Bayburt, the smallest city by about 75 thousands population, seems to be the smallest housing market. According to the regional income (measured by value-added),

<sup>2</sup> The Central Bank of Turkey started to provide house price index for all provinces in 2015. However our data has been collected in the last quarter of 2013.

İstanbul is the richest city, while Kars takes the lowest value. İstanbul seems to be the most expensive city in terms of average house prices (289.000TL), and Bilecik is the cheapest city by 82.400TL.

Most of the houses purchased by foreigners are in Antalya, a touristic city in Mediterranean, followed by İstanbul, Muğla, and Aydın. Apart from İstanbul, all those cities are in the coast. Houses owned by mortgage credits consist about 36% of the total houses. The least mortgage credits demanded in Van, and the most in Denizli. The average ratio of social housing provided by HDA (TOKİ) is about 40%. The maximum ratio of social houses is in Van, the city where a severe earthquake took place in 2011. In some cities, such as Artvin, Isparta, Yalova, Aydın, and Mersin, HDA does not exist in housing market. About one-third of those houses were built for low-income groups. About half of the social houses are for low-income groups in some cities such as Van.

To establish a systematic relationship between those variables, equation (2) has been estimated by OLS technique, and the results are reported in Table 3. The model seems to fit quite well; F-statistic is significant at 1% level and adjusted R2 is above 0.80 in all regressions.

The model including income, price and population is estimated firstly (Reg.1). The results are as expected in the theory of demand; the income level of the region affect the demand for housing positively, and it is significant at 5% level. The magnitude of the coefficient shows that the income elasticity of demand for housing is below unity, reflecting that it is income inelastic. Coefficient on house prices seems to affect the demand for houses negatively as expected; however, it is also below unity, reflecting price inelastic demand.

House ownership is also related to wealth accumulation, and the wealth effect may be even more important than the income effect. To test for the wealth effect, we have included a income &wealth (IW) index in the regressions. This data is provided by the Turkish Statistical Office, and it includes both income and wealth. In Reg.2 both income and income &wealth index have been included in the estimation. The effect of income &wealth index offsets the impact of income, as it includes the income too. The impact is significantly positive and the magnitude of the coefficients is much higher than the coefficient for income only. This result shows that the effect of wealth is higher than the effect of income. This is consistent with the fact that the housing demand is at least partly related to wealth accumulation.

Table 3. Regression Analysis

Variables	Reg. 1	Reg. 2	Reg. 3	Reg. 4
Constant	-3.45 (3,13)	0.62 (3,15)	0,51 (2,44)	0,59 (2,44)
lnY	0,28** (0,13)	-0,005 (0,12)		
IW		1,95*** (0,56)	1,94*** (0,54)	1,92*** (0,56)
lnP	-0,49** (0,22)	-0,60*** (0,23)	-0,60*** (0,22)	-0,60*** (0,22)
lnN	1,03*** (0,08)	1,14*** (0,08)	1,14*** (0,08)	1,14*** (0,07)
lnF	0,06*** (0,02)	0,03* (0,02)	0,04** (0,02)	0,04** (0,02)
M <sub>h</sub>	-0,66 (1,00)	-1,53 (0,79)	-1,53 (0,75)	-1,50 (0,71)
S <sub>h(total)</sub>	-0,15*** (0,05)	-0,13** (0,05)	-0,13** (0,05)	-0,15** (0,07)
S <sub>h(low income)</sub>	-0,14 (0,77)	-0,18 (0,67)	-0,19 (0,64)	
R <sup>2</sup> (Adjusted)	0.84	0.88	0.88	0.89
S.E. of regression	0.4844	0.4189	0.4147	0.4111
Sum sq. resid.	11.967	8.7720	8.7724	8.7895
Log-likelihood	-36.654	-27.491	-27.493	-27.550
F-statistic	44.683***	54.570***	63.610***	75.503***

The results are based on the White heteroskedasticity-consistent standard errors & covariance.

Asterisks denotes significance at \*10%, \*\*5%, and \*\*\*1% levels.

The population affects the demand positively and significantly as expected and the elasticity is about unity. So, a 1% increase in population is associated with about a 1% rise in demand for houses. Although the size of the families may have impact on the number of dwelling in provinces, in a cross-section analysis, this result seems to be reasonable.

An extra demand comes from the foreigners particularly in the metropolitan cities and the coasts. The number of houses bought by foreigners has been included in the regressions, and the results show that a 1% increase in the demand by foreigners increases the total demand for houses about 0,06 %. This result is significant at 5% level in all regressions.

The mortgage system is expected to increase the home ownership. Despite that the system has been inserted in the financial system of Turkey in 2007, the implementations still work as a simple credit system. This also may be regarded as an incentive for house owning. The ratio of houses sold on mortgage to total houses sold has been included in the regressions, and it seems to be insignificant. In various studies, interest rates has been used as an explanatory variables and found to be significant; while the interest rate decreases, the demand for house rises, and vice versa. However, in such a provincial based cross-section analysis, it is obvious that the interest rate is about the same in the whole country, and the share of mortgage credit does not seem to create any impact on the demand for housing (see İbicioğlu and Karan (2012) for a time-series analysis of Turkey).

Social housing provision is regarded to be more important than other policy tools towards housing sector, because it is a direct intervention. This has been implemented by the Housing Development Administration, providing houses to middle- and low-income groups (both included in Reg.3). The houses built for low-income groups do not seem to be significant, despite its negative sign. However, the ratio of total houses is negative and significant showing that a 1% increase in provision by HDA decrease the demand about 0,15% (Reg.4). The HDA model is regarded to function as an umbrella rather than a competing body in the housing sector of Turkey.<sup>3</sup> It seems that the houses targeting the low-income groups does not create any competitions with the private sector in housing sector. However, HDA does compete with the private sector by providing houses to the middle income groups. It seems that the housing program substitute about 15% of the market supply.

#### 4. Conclusion

The demand in housing sector has been increasing in Turkey, fuelled by population growth, urbanization, and the demand by foreigners. As the construction sector is one of the main factors stimulating economic growth, government ought to take it serious, and implement adequate regulations and policies towards the sector. The most important steps taken in the last decade are the insertion of the mortgage system and public housing. The mortgage system works as a simple loan system, since the financial system is not as deep as expected. Unless the securitization of the system, the mortgage system would not significantly stimulate the housing sector. Our findings support this.

The other debate is the main task of the Housing Development Administration of Turkey (HDA). The main task recognized in public is the support for social housing for low- and middle-income groups. Those groups' income level is not high enough to own houses through a mortgage system, as the installments are high compared with their monthly wages, and the period for reimbursement is short. Our findings support the argument that the low-income groups would not have been able to own a house, unless the HDA did not provide apartments on convenient conditions. It seems that the public provision is unavoidable to provide adequate housing for low income groups, and to sustain an appropriate urbanization. On the other hand, the publicly provided houses targeted middle-income groups create crowding out effect on the housing market.

It should be noted that further studies should be implemented to establish a more systematic policy recommendations. We have carried out this study by the municipal-based data. Household-based studies are required to analyze the issue in more details. Given the high growth rates and increasing population and urbanization, the issue is going to be on the agenda for few decades. So, a research agenda should include more details regarding the housing sector in Turkey. No doubt that the public housing will be a significant part of such an agenda.

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<sup>3</sup>See the web-site of HDA (<http://www.toki.gov.tr/english/index.asp>).

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