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STUDYING THE INFLUENCE OF CONSTRUCTION PROJECTS OF TEHRAN MUNICIPALITY ON THE COST OF HOME IN IRAN-TEHRAN

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Abstract *The influence of various effective factors on urban economy is manifested in the cost of house and land. Population changes, large scale and regional policymaking, performing urban projects and labour market developments are among the most important and influential issues on the economy of land and urban housing. On the other hand, changes in the cost of land and house cause changes in supply of house or construction in the whole land and house market.*

In the literature of economy, cost is the most important factor which determines the behaviour of the customerwho tries to optimize hisdemand and favourability based on his budget and goods' cost. Construction projects like building roads, highways, tunnels, bridges, etc. contribute to the cost of housing in a region.

This research is an analysis of influential factors (land cost, total municipal costs, municipal construction costs, the construction costs of each region, total costs in each region) on the cost of house (regardless of factors like liquidity, coin and exchange rate, demand growth, etc.) over the period of 2005 to 2011.

In this research, we have used housing cost based on the econometric model through Minitab 16 software. To test the hypothesis, the basic data about 22 municipal districts of Tehran were examined using collinearity test and Breusch–Pagan autocorrelation test.

The results suggest that there is a negative meaningful relationship between tax avoidance and corporate transparency and also firm value.

Keyword: *Municipal Construction Costs, Econometrics, Housing Cost, Construction Projects*

INTRODUCTION

Housing, as the smallest element which makes human settlements, is the most important need of mankind and it is considered to be one of the phenomena that creates geographical phenomena in each area (Ziari & Dehghan, 2003). As urbanization and urban population increase, supplying houses becomes one of the greatest issues in each region (Zarenejad & Anvari, 2006). On the other hand, issues like population growth, formation of new families, migration from villages, demolition and renovation of buildings due to depreciation of old buildings, shrinking the size of old houses and other similar issues have doubled the housing problems (Khosh Akhlagh *et al.*, 2008).

However, technical and scientific advancements in construction and social reform conditions and the importance of fulfilling humans' vital needs have made construction of lasting buildings a necessity which is now felt greater than ever (Javadi, 1999).

Iranian economy has experienced greatest fluctuations in housing costs over the last 2 decades. Great stagnations and prosperity in housing section have left harmful effects on this section and other sections of economy (Naji Meidani *et al.*, 2010).

As housing section is one of the most notable and fluctuated parts in Iranian economy, great analysis of housing market and good recognition of influential factors on it can help planners and policymakers with correct analysis and prediction and provide solutions in accordance to it. In this research, we have studied the influence of Tehran municipal construction projects on the housing cost in the city of Tehran.

REVIEWING DOMESTIC AND FOREIGN STUDIES

To study the influence of housing costs on construction projects, reviewing the studies conducted about this issue in

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Table 1: Reviewing Domestic Studies on Influential Factors on Housing Cost

Author	Year	Research title	Research methodology	Research results
AlaviZerang	2002	The role of Bank Maskan facilities on house market fluctuations in Iran	Statistical data were studied in to quarterly and annual method under two scenarios. Autoregressive and Angle-Granger long-term convergence	Banking facilities and national revenue fluctuations over short and medium time, and fluctuations in the wholesale cost of building materials make the greatest contribution to house market fluctuations
Khiabani	2003	Determining factors of housing cost in Iran	From 1992 to 2001 through AEDL method	The actual quantity of money, actual production, actual cost of exchange and stock cost determined housing behaviour over a long time, and actual quantity of money, actual production, actual stock index were factors which determined the cost of house in short time.
Akbari et al.	2004	Studying the determining factors of house cost in Meshad	Using spatial econometrics approach and Hedonic pricing method	The existence or absence of spatial dependency in Hedonic model based on the type of houses and scope of inframarkets specified for them is different.
Esfandiari	2004	Studying and determining the influential factors on the cost of residential units in Isfahan	From 1992 to 1998 through Hedonic function approach and time sequence data	Physical factors like facilities influence the cost of residential units more than spatial factors like access to wide streets.
Eskandari	2006	The relation between housing cost and business cycles	From 1942 to 1998 through autoregressive pattern and error correction	Construction cost or workforce efficiency in industry and service sections has direct relation with per capita capital. It also has an indirect relation with workforce efficiency in construction section.
Zarepour	2006	Studying the influence of social and economic factors on Iranian housing cost	From 1970 to 2003 through minimum ordinary squares estimation method	Urbanization rate, rent rate, annual revenue, unemployment rate, building material costindex and housing tax have direct influence over housing cost while GNP and the number of building licenses issued have adverse influence on housing costs
Jafari Samimi et al.	2007	Effective factors in housing costindex	From 1994 to 2005 through ARDL method	Household per capita income, stock costindex, building service costindex, number of completed buildings, monetary level and inflation rate have good distributive power for determining the behaviour of housing costindex in Iran.
Chegini&Asgari	2007	Studying the influential factors on housing cost in urban areas of Iran	From 1991 to 2006 through panel data approach	Stock index, general level of costs in the previous period, land cost, construction cost, oil cost, and bank interest rate influence housing cost in long time; and housing cost over the last period, number of people in a household, gold cost, etc. determine the costs in long time.
Gholizadeh & Kamyab	2009	Studying the influence of monetary policy on housing cost bubble in prosperity and stagnation period in Iran	From 1992 to 2006 through ARDL method	Interest rate variable has a stronger influence on forming bubbles in the period of prosperity. Monetary policies variables are among the most important variables, while GDP variables are among the least important ones which influence the housing bubble.
Varesi&Mousavi	2010	Studying the influential factors on the housing cost of Yazd's third district	Through Hedonic cost model using Eviews software	Area of land, area of infrastructure, and number of floors were identified as the most important influential factors on housing in Yazd.
Nasrollahi et al.	2010	Studying the manner of Dutch diseases and the influence of banking facilities on housing cost in Iran	From 1971 to 2004 based on ARDL	Oil revenues and building costs have a positive influence on housing real cost, while GDP and the growth rate of banking facilities have a negative influence on housing real cost.

Gholizadeh & Kamyab	2010	Studying the reaction of monetary policies about housing cost bubble	From 1992 to 2006 through ARDL method	Appropriate reaction from monetary authorities requires a consideration of housing cost in the rules of monetary policies, and consideration of this variable minimizes social losses.
Naji et al.	2010	Studying the influence of macroeconomic factors dynamism on housing cost fluctuations in Iran	From 1990 to 2007 based on quarterly data and error and correction pattern	Positive and meaningful influence of macroeconomic variables like quantity of money, GDP, consumer cost index and exchange rate on the behaviour of housing cost index in Iran.

Iran and other foreign countries seems a necessity. In this part, we will discuss studies on national and international scales. In this paper, we have explained the influences of all economic variables which can affect the housing cost.

Foreign Studies

Domestic Studies

What is observed in foreign studies is the influence of macroeconomic factors on housing cost and also the influence of housing cost on macroeconomic factors.

INFLUENTIAL FACTORS ON HOUSING COST

As we can observe in the history of domestic and international studies, there are various factors that cause fluctuations in housing cost. These factors are categorised to three major groups: factors caused by house demand, factors caused by house supply, and factors caused by macroeconomic variables.

Influential Factors on House Demand

Income: Since changes in income cause changes in house demand; thus gaining more income sources for families contributes to more demands for house.

Population: If population in a country has an increasing trend, then demands for house will rise and influence housing cost.

Expectation: In consumer's view, house is a product without substitute and dedicates a large portion of family's budget to itself (some 30% of the family's budget). Thus during inflation period, house will be subject to agitate actions. So people get into house market to keep their purchase power (Rahimpour&Ghahani, 2011).

Bank loans: Financial security through housing loan helps more applicants improve their financial power. As the share of bank loan in improving people's financial power increases, their purchase demand goes up.

Influential Factors on House Supply

Land Cost: Land cost is an influential factor in house cost and its fluctuations. If house cost increases, the purchase power of families will decrease and house market will experience stagnation. Land cost increase causes higher (while supply is constant) housing cost in short time. Considering the results of researches, the reaction of housing cost to land cost in short time is 0.72 and in long time is 0.63 (Asgari & Almasi, 2007).

Building Service Cost: Building cost index is a general index. It includes the index of an experienced bricklayer, index of daily payment of simple building worker, index of the asphalt man's payment, index of pitman's payment, index of cementman's payment, index of tile worker's payment, index of plastworker's payment, index of skilled plumber, and index of skilled electrician. In other words, this general index includes the costs of workforce in various levels of construction and building.

Cost of Building Materials: As the cost of building materials increases, the cost of building grows higherand, thus, increases the total cost of house.

Bank Interest Rate: The interest rate of bank loan is an influential factor in determining housing cost, because financial supplement of most buildings is made possible by loans and banking facilities. Increasing the cost of using such facilities increases the final cost and, consequently, each square meter of a residential unit.

Area and Density Index: In a study that compared Tehran metropolis to other 19 metropolises of the world, land supply in Tehran is insignificant and this factor contributes to more density and higher housing costs of residential units (Rahimpour & Ghahani, 2011).

Coin and Oil Market: Oil cost in short time and gold cost in long time play a major role in housing cost. Studies indicate that 1 one-percent increase in oil cost causes a 0.03 percent increase in housing cost (Nasiri, 2004).

Table 2: Reviewing Foreign Studies on Influential Factors on Housing Costs

Author	Year	Title	Research Methodology	Research Results
Bonnie	1998	The influence ofmacroeconomic variables on housing cost and sold houses	Autoregressive pattern	House market is sensitive to occupation shocks and mortgage rate in national and regional level.
Chen et al.,	1998	Housing cost dynamism: an analysis of new Thai housing market	Thai housing costs from 1971 to 1993 is studied.	Housing cost is a function of actual interest rate, actual stock cost index, building cost and per capita revenue.
Ortalo-Magne and Rady	1999	Young households and housing cost cycle	With revenue diversity and credential restrictions, housing costs can act as a balance response to revenue shocks and credit market.	Early 80s financial liberalization was very important in helping young households to afford house.
Lastraoes	2002	Evaluating housing cost dynamism reaction to money supply shocks	Market dynamism balance pattern	Monetary shocks have positive and real influences on house market.
Lang and Neukirchen	2002	Macroeconomic variables in housing costs of Australia	It has studied the influence of long-term interest rate, household revenue, GDP, exchange rate and population on housing cost boom.	Population changes and interest rate have respectively the highest and lowest influence on prosperity and stagnation of house section.
Apergis	2003	Housing cost and macroeconomic factors with a view of Greece	Using VAR and error correction pattern and studying the influence of some macroeconomic variables dynamism on the cost of new houses in Greece	Inflation and employment rate have a positive influence on real housing cost, while interest rate has an adverse influence. Variance analysis shows the highest distribution power for interest rate among variables.
Ortok and Terrones	2005	Features of housing international costs dynamism, interest rate and macroeconomic factors in industrial countries	Through VAR pattern	Macroeconomic factors such as actual production, consumption and housing investment do not have much influence on fluctuations in housing costs, while housing cost influences macroeconomic factors.
Davidoff	2005	The influence of macroeconomic variables and land on housing cost	Housing cost is a function of stock cost, land cost and new investments in housing section.	The cost elasticity of land is nearly great and meaningful compared to payments. It has a small and negative elasticity compared to actual interest rate, while it has a meaningful cost elasticity compared to stock value.
Delnegero and Otrok	2007	Monetary policy and housing cost in the US	The influence of monetary expansion policy on the rise of housing cost using VAR model from 1986 to 2000	Monetary policy shocks on housing costhavebeen insignificant against recent fluctuations.
Delucia	2007	Does the monetary expansion policy employed by federal bank causes housing cost bubble?	American economy quarterly data from 1975 to 2005 werestudied in the form of VAR within two different samples.	The reaction of housing cost against interest rate has been different over the period, yet no change is seen in reaction of interest rate to inflation.
Selim	2008	Determining the housing cost in Turkey: Hedonic regression against artificial nervous network	Using Hedonic pattern and artificial nervous network	Artificial nervous network can be a better substitute for prediction of housing cost in Turkey.
McQuinn and O'Reilly	2008	Evaluating the role of revenue and interest rate in determining housing cost in Ireland	Demands of house depend on the loan people can get from financial institutes.	There is a long-term relation between actual housing cost and the loan people get.
Beltratti and Morana	2010	Fluctuations of macroeconomy and international housing cost	It studies the relation between macroeconomic factors and house market in member states of Group Seven	Compared to consumption and production, investment shows a stronger reaction to housing cost shocks.
Gimeno and Martinez	2010	Relations between housing cost and housing loan: Spain	Determining the deviation of variables from their balance level through error correction model	Bothe variables are dependent upon one another in long time and both variables remain above their balance level until the end of study period.

Table 3: Influential Factors on Housing Cost (Source: Authors)

Influential factors on house demand	Influential factors on house supply	Factors caused by macroeconomic variables
• Revenue • Population • Expectations • Bank loans	• Land cost • Building service cost • Building material cost • Bank interest rate • Area and density index • Gold market • Stock market	• Inflation rate • Exchange market • Oil market • GDP • Money and liquidity volume

Factors Caused by Macroeconomic Variables

Inflation Rate: Generally, general cost levels and inflation rate have considerable influences on housing cost. Based on the experts' researches, the inflation rate in Iran is mostly due to budget shortage in high liquidity, construction needs and great projects are made possible through budget supply in macro level through Rial expenditures (Varesi & Mousavi, 2010).

Events in Exchange Market: As the exchange rate increases, the national money loses her value. In this condition, people will turn to lasting goods like house to preserve the value of their properties (Economical Studies Group, 2010).

GDP: There is a positive relationship between actual GDP and housing cost. Increasing the growth of GDP raises the real housing costs. Housing prosperity occurs with high growth of GDP. However, decline in housing cost leads to stagnation of GDP cost (Kamyab & Gholizadeh, 2009).

Growth in Money and Liquidity Level: Huge monetary growth based on liquidity shocks is one factor that drives housing cost. Merchandisingactivities in housing section increases itscost even more (Samimi*et al*., 2007).

The growth rate of various influential factors on housing cost in Tehran from 2005 to 2012isrepresented in Table 4. As we have observed in majority of domestic and foreign studies, the influence of various variables on housing cost has been studied; yet no research has been conducted about the influence of urban construction projects on housing cost. In this paper, we seek to study the influences of construction projects undertaken by Tehran Municipality from 2005 to 2012 on housing cost.

THEORETICAL PATTERN OF THE RESEARCH

In this research, the relation of housing cost as the variable dependent to land cost, total municipal cost of Tehran and

Table 4: The Growth Rate of Influential Factors on Housing Cost

Year	Inflation rate	Liquidity	Population (million)	Dollar rate	Coin	Oil revenue	Stock	Housing cost	Interest	Revenue	Bank loan	GDP	Building services	Building materials
2005	10.4	34.3	-	3	35.8	-	60.9	12	13	25.1	50	6.19	17.1	11.6
2006	11.9	39.4	13.4	1.7	130.6	14.8	220.9	28	11.5	26.7	-	7.32	17.8	20.1
2007	18.4	27.7	-	1	45.4	32.6	-53.7	81.5	13.36	20	-	7.84	37.9	17.7
2008	25.4	15.9	-	6.3	2.2	0.37	-49.8	23	15.07	14.3	-	0.83	24.8	29.8
2009	10.8	23.9	-	1.7	22.2	-24.3	374.2	-23.9	14.57	-2.1	-	3.16	6.6	-5.4
2010	12.4	25.2	-	2.8	43.4	19.35	44.2	-	13.64	16.5	11.1	6.38	11.6	-
2011	21.5	19.4	12.2	12.6	107.5	52.7	63.4	-	16.29	25.01	-	2.3	21.8	-
2012	30.5	30.8	-	94.5	76.3	-55.75	40.2	-	-	-	-	-	44.5	-

(Source: Central Bank of the Islamic Republic of Iran; Iranian Economy Website www.iraneconomy.ir; Tehran Press website www.tehranpress.com; Mashregh News www.mashreghnews.ir; Statistical Center of Iran)

the construction cost of Tehran municipality as independent variables were studied.

Main Goal of Research

The main goal of research is to evaluate and study the explanatory level of independent variables like land cost, total and construction costs in Tehran municipality and total and construction costs of districts on average housing cost in each district. In mathematical terms, the model's equation is defined as:

Equation (1): PR=f(PL,TC,CC,tc,cc)

Model (1): $PR=\alpha + \beta1(PL) + \beta2 (TC) + \beta3 (CC) + \beta4 (tc) + \beta5 (cc)$

To use the benefits of logarithmic functions in estimating tractions for econometric pattern, the second model was rewritten as:

Model (2): $LN(PR)=\alpha + \beta1LN(PL) + \beta2 LN (TC) + \beta3 LN (CC) + \beta4 LN (tc) + \beta5 LN (cc)$

Research Hypothesis

Solving many of the scientific problems is made possible through research hypothesis, thus a hypothetical relation is defined between the two variables for this subject in such a way that five main hypotheses are assumed for describing the influence of construction projects. We will study them one by one.

1. The cost of one square meter of land in the t period in Tehran influences the housing cost in Tehran.
2. The total costs of Tehran municipality in the t period influences the housing cost in Tehran.
3. The total construction costs of Tehran municipality in the t period influences the housing price in Tehran.
4. The total costs of municipality in the t period and idistrict influences the housing price in Tehran.
5. The construction costs municipality in the t period and idistrict influences the housing price in Tehran.

Research Variables

Research variables include housing price variable as a dependent price and other variables in Table 5 as independent variables.

RESEARCH METHODOLOGY

The research methodology is that of description and survey. The information used in this research consists of two parts. The first part includes information about housing prices for each of the 22 municipal districts of Tehran and price of land in Tehran based on the statistics drawn from Iranian center of statistics which gives information about average square meter price of land from 2005 to 2011 (Iranian statistics center, statistical yearbook). The second part contains information about the total and construction-used prices of Tehran municipality for each of the 22 districts from 2005 to 2011. This information are drawn from municipal budget preparation reports which are considered to be the most credible document of spending budget in Tehran municipality (Tehran municipality budget preparation report, various years).

This research is an analysis of influential factors (land cost, total municipal costs, municipal construction costs, the construction costs of each region, total costs in each region) on the cost of house (regardless of factors like liquidity, coin and exchange rate, demand growth, etc.) over the period of 2005 to 2011.

Econometrics as a result of a specific approach of economy consists of using mathematical statistics in economic data for providing empirical evidence to confirm models made by the economy of mathematics and to gain numerical results. In other words, econometrics is a branch of economy which tries test the correctness of economic theories with the aid of statistical interpretation and quantitative data from the real world (Abrishami, 1390). In common econometric methods

Table 5: Independent and Dependent Variables of Research

Variable	Nature of variable	Variable's title	Collection source
PR_{it}	Price of one square meter residential unit in period t and districti	Dependent	Iranian Center of Statistics
PL_t	Price of one square meter land in period t in Tehran	Non-dependent	Bulletins of ministry of housing
TC_t	Total costs of Tehran municipality in period t	Non-dependent	Tehran municipality budget preparation report
CC_t	Construction costs of Tehran municipality in period t	Non-dependent	Tehran municipality budget preparation report
tc_{it}	Total costs of Tehran municipality in period t and districti	Non-dependent	Tehran municipality budget preparation report
cc_{it}	Total construction costs of Tehran municipality in period t and districti	Non-dependent	Tehran municipality budget preparation report

and ordinary squares, the general form of linear regression equation is as follows

$$Y = \beta 1 + \beta 2\ X + U$$

which is indicative of this fact that dependent variable Y is linearly related to explanatory variable X, yet their relation is not necessarily accurate and determined and its shape depends upon the changes in individual cases. U as a small disruption or error is also a random variable which has specific possible properties. In other words, U could indicate all forces which are not clearly taken into consideration yet influence the dependent variable Y.

To determine the housing price based on econometrics model with formulas 1 and 2 in this research, we used Minitab 16 software. To test the hypothesis', data bout Tehran's 22 municipal districts were gauged using collinear tests and Breusch–Pagan autocorrelation test.

RESULTS ANALYSIS

In this research, information about four districts in north (District 1), south (District 18), east (District 4) and west (District 5) were analyzed (it is necessary to mention that this information were studied for the whole 22 districts, yet to better understand the influence of projects on housing prices, information of these 4 districts were studied). Tables 6 to 13 show information about prices and costs in various urban districts. To better use econometrics patterns, tables related to logarithm are also utilized.

Table 14 shows testing results of various tests. Using both collinear and autocorrelation tests, information of the all four districts was studied and we arrived at the following conclusions:

Table 6: Information About District 1

Year	Housing price (thousand rials*)	Price of land (thousand rials)	Total costs of Tehran municipality (billion rials)	Construction costs of Tehran municipality (billion rials)	Total cost of the district (billion rials)	Construction cost of the district (billion rials)
2005	13920	6477	5013	3012	353	243
2006	19950	8494	7372	4429	519	357
2007	32472	18287	9291	7988	678	565
2008	42179	15433	19292	17597	1322	1164
2009	28401	15252	19960	16647	1712	1417
2010	27520	15924	29680	25531	3002	2651
2011	35645	20870	38009	32979	4720	4404

* The Currencies of Iran

Table 7: Information About District 1(use the Logarithmic Functions)

Year	Housing price (thousand rials)	Price of land (thousand rials)	Total costs of Tehran municipality (billion rials)	Construction costs of Tehran municipality (billion rials)	Total cost of the district (billion rials)	Construction cost of the district (billion rials)
2005	9.5	8.8	8.5	8.0	5.9	5.5
2006	9.9	9.0	8.9	8.4	6.3	5.9
2007	10.4	9.8	9.1	9.0	6.5	6.3
2008	10.6	9.6	9.9	9.8	7.2	7.1
2009	10.3	9.6	9.9	9.7	7.4	7.3
2010	10.2	9.7	10.3	10.1	8.0	7.9
2011	10.5	9.9	10.5	10.4	8.5	8.4

Table 8: Information About District 18

Year	Housing price (thousand rials)	Price of land (thousand rials)	Total costs of Tehran municipality (billion rials)	Construction costs of Tehran municipality (billion rials)	Total cost of the district (billion rials)	Construction cost of the district (billion rials)
2005	4204	6477	5013	3012	231	141
2006	5017	8494	7372	4429	340	207
2007	9050	18287	9291	7988	354	298
2008	11076	15433	19292	17597	608	533
2009	9138	15252	19960	16647	857	718
2010	9169	15924	29680	25531	1021	857
2011	10436	20870	38009	32979	886	704

Table 9: Information About District 18 (use the Logarithmic Functions)

Year	Housing price (thousand rials)	Price of land (thousand rials)	Total costs of Tehran municipality (billion rials)	Construction costs of Tehran municipality (billion rials)	Total cost of the district (billion rials)	Construction cost of the district (billion rials)
2005	8.3	8.8	8.5	8.0	5.4	4.9
2006	8.5	9.0	8.9	8.4	5.8	5.3
2007	9.1	9.8	9.1	9.0	5.9	5.7
2008	9.3	9.6	9.9	9.8	6.4	6.3
2009	9.1	9.6	9.9	9.7	6.8	6.6
2010	9.1	9.7	10.3	10.1	6.9	6.8
2011	9.3	9.9	10.5	10.4	6.8	6.6

Table10: Information About District 4

Year	Housing price (thousand rials)	Price of land (thousand rials)	Total costs of Tehran municipality (billion rials)	Construction costs of Tehran municipality (billion rials)	Total cost of the district (billion rials)	Construction cost of the district (billion rials)
2005	6173	6477	5013	3012	379	217
2006	8960	8494	7372	4429	557	319
2007	14787	18287	9291	7988	654	560
2008	19638	15433	19292	17597	2330	2210
2009	16411	15252	19960	16647	2032	1775
2010	16928	15924	29680	25531	2717	2363
2011	20145	20870	38009	32979	2534	2117

Table 11: Information About District 4(use the Logarithmic Functions)

Year	Housing price (thousand rials)	Price of land (thousand rials)	Total costs of Tehran municipality (billion rials)	Construction costs of Tehran municipality (billion rials)	Total cost of the district (billion rials)	Construction cost of the district (billion rials)
2005	8.7	8.8	8.5	8.0	5.9	5.4
2006	9.1	9.0	8.9	8.4	6.3	5.8
2007	9.6	9.8	9.1	9.0	6.5	6.3
2008	9.9	9.6	9.9	9.8	7.8	7.7
2009	9.7	9.6	9.9	9.7	7.6	7.5
2010	9.7	9.7	10.3	10.1	7.9	7.8
2011	9.9	9.9	10.5	10.4	7.8	7.7

Table12: Information About District 5

Year	Housing price (thousand rials)	Price of land (thousand rials)	Total costs of Tehran municipality (billion rials)	Construction costs of Tehran municipality (billion rials)	Total cost of the district (billion rials)	Construction cost of the district (billion rials)
2005	7423	6477	5013	3012	308	211
2006	10594	8494	7372	4429	453	311
2007	17088	18287	9291	7988	667	596
2008	20107	15433	19292	17597	1475	1374
2009	16565	15252	19960	16647	1247	1016
2010	17510	15924	29680	25531	3709	3449
2011	21210	20870	38009	32979	3390	3091

Table 13: Information About District 5(use the Logarithmic Functions)

Year	Housing price (thousand rials)	Price of land (thousand rials)	Total costs of Tehran municipality (billion rials)	Construction costs of Tehran municipality (billion rials)	Total cost of the district (billion rials)	Construction cost of the district (billion rials)
2005	8.9	8.8	8.5	8.0	5.7	5.4
2006	9.3	9.0	8.9	8.4	6.1	5.7
2007	9.7	9.8	9.1	9.0	6.5	6.4
2008	9.9	9.6	9.9	9.8	7.3	7.2
2009	9.7	9.6	9.9	9.7	7.1	6.9
2010	9.8	9.7	10.3	10.1	8.2	8.1
2011	10.0	9.9	10.5	10.4	8.1	8.0

Table 14: Results of Administering Collinearity and Autocorrelation on Various Urban Districts

Test name	Index studied	District 1	District 18	District 4	District 5
Collinearity					
VIF		14.93	336.196	20.667	16.632
Breusch–Pagan autocorrelation					
F		0.425	0.3	0.26	19.8
LM		4.76	4.2	3.99	6.93
R2		0.68	0.6	0.57	0.99

Analysis of the Information

Table 14 shows the results of collinearity and autocorrelation test about the influence of construction projects on housing price in various urban districts. To better understand the above table, those indexes are explained in detail:

District 1

Collinearity Test: As the VIF value for price of land (PL), total and construction costs of Tehran municipality (CC & TC) and total and construction costs of district 1 municipality (CC1 & TC1) are more than 10, thus there is great collinearity between data.

Breusch-Pagon Autocorrelation Test: Breusch-Pagan autocorrelation test was used to study the existence of Variance anisotropy in the data. As R^2 value for district 1 information is 68.7% and n=7 and k=5, LM values equals 4.76 which is less than the value reached at Chi-square distribution table (). Thus, there is no variance anisotropy.

District 18

Collinearity Test: As the VIF value for price of land (PL), total and construction costs of Tehran municipality (CC & TC) and total and construction costs of district 18 municipalities (CC18 & TC18) are more than 10, thus there is great collinearity between data.

Breusch-Pagon Autocorrelation Test: Breusch-Pagan autocorrelation test was used to study the existence of Variance anisotropy in the data. As R^2 value for district 1 information is 60% and n=7 and k=5, LM value equals 4.2 which is less than the value reached at Chi-square distribution table (). Thus, there is no variance anisotropy.

District 4

The same things hold true for District 4 and there is no variance anisotropy for this district either. Thus, research hypothesis is confirmed for this district.

District 5

The VIF and LM values reached indicate high collinearity and the absence of variance anisotropy. Thus, research hypothesis is confirmed for this district.

CONCLUSION AND SUGGESTIONS

In recent years, various studies have been conducted about the influential factors on housing price in house market, including income, population, expectation, bank loans, building service costs, etc.

Using statistical tests, we studied influential factors on housing price in Tehran with a view of construction projects implemented by municipality from 2005 to 2011. Based on the theoretical principles of the research, factors like price of land, total municipal costs, municipal construction costs, construction costs of each district, and total costs in each district were highlighted as influential variables on housing price in Tehran.

The conclusion drawn from the results of this research is that housing price in Tehran depends on total municipal prices and municipal construction costs. Yet, their resulting influence on housing price in municipal construction costs is more obvious. This fact means that spending municipal budget for construction and providing urban life infrastructures make great contribution to urban prosperity and, inevitably, economic prosperity in cities. As a result, housing price which is one of the major costs in the cost basket of citizens increases, too. For example, construction of Chitgar Lake in District 22 has increased the housing price in that district in recent years, and as there are worn textures in area 9 and 10, it can contribute to raising the housing price in these districts.

Tehran municipality and municipalities of its 22 districts are recommended to divert their costs to construction and infrastructure costs which will bring about economic prosperity. The more they reduce their running costs, the more prosperous and lively will the city be. Furthermore, paying attention to the southern districts of Tehran and

spending construction and infrastructure budgets in this district helps reduce the gap between the north and south of the city and brings about social justice.

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