SPECIFYING THE EFFECTIVE DETERMINANTS OF HOUSE PRICE VOLATILITIES IN IRAN

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ABSTRACT

The housing sector is one of the key sectors in an economy and its fluctuations could be accompanied with stagnation or expansion in other parts of an economy. Additionally, this sector has an intra-economic role in near to 120 sub-industries which therefore indicates its importance in an economy. Hence, this study examines the effective determinants of house price volatilities using the Engel Granger co-integration technique after modeling the price volatilities under the E-Garch model for the period 1973-2008 in Iran based on Eviews and Mathematica Software. The findings indicate that all variables, including coin price, GDP proxy, volume of money, inflation rate, and house interest rate have a significant impact on the volatilities.

Keywords: House Price, Elasticity, Volatilities, Iran.

JEL: C22, C5

1. INTRODUCTION

The house sector, because of having a great role in absorbing liquidity, generating jobs and so on, is recognized as a forerunner part of every economy and statespersons and politicians always try to solve the problems of this sector in order to enhance the economic growth. The Iranian housing sector has experienced inflationary crises and inefficient demand in recent years due to its large price deviations. Hence, identifying its affected variables should be considered to the corresponding officials in order to stabilize their economies. A lot of studies have been done in external and internal limits about instigating the effective determinants on house price. But the main point which is important here is that, there are several direct and indirect effective factors in this sector.

For example, Zarehpour (2006) applied some variables such as: the rate of house rent, urbanization rate, per capita income, bank credits, house tax, GNP deviations, government expenditures, unemployment rate and number of housing permits. The other study which was conducted by Davidof (2006) considered the house price as a function of land price, investment rate in house sector, and index of shares price.

The house price has had remarkable fluctuations in 40 years in Iran so that its largest growth goes back to the year 1977 after the rise of global oil prices that pour considerable liquidity into the Iranian economy. The second largest growth of house prices is relevant to the period 1995-1998 which was due to backwardness of house price from the inflation rate. Though the growth of house price had a decreasing trend by year 2005, after this time its trends had its highest level in 2008. The inflation rate and price of house sector increased from 100 to 413 and 536.6 respectively during the period 1997-2007 (Abbasinejad and Yavari 2009, pp. 61-44).

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Hence, this study looked for the main factors of house price volatilities by modeling the volatilities under the E-Garch model and using the Engel co-integration approach in order to measure the level of the its importance besides their symptoms on the volatilities over the period 1973-2008.

2. THEORETICAL BASIS

Household per capita income

Theoretically the rise of per capita income shifts the household budget line to right and increases demand of house commodity (consumption demand). On the other hand, the rise of the income leads to increased demand of house as a capital commodity. With respect to the Keynesian theory, the rise of income increases marginal propensity of saving so that it is expected to enhance household tendency to invest. The house market as an appropriate location can absorb some parts of these investments for households. The investments could have a significant impact on the supply side of house market through constructing and building by the private sectors or households (Jafari Samimi et al. 2007, pp. 33).

Oil revenues

Importance of the oil sector as an integral part of the Iranian economy has had a considerable role in both stagnation and expansion periods. According to the Dutch disease it can be said that there are three main reasons of a positive oil shock existence in the increase of relative prices of non-tradable goods and commodities such as houses than of tradable goods. Firstly, people's need for tradable goods is fulfilled through import while this cycle is not common for non-tradable commodities such as houses. Thus, the employed workers of such markets, housing, industries and services, move toward the oil sector which has more returns. Secondly, increase of nominal and real wages in the oil sector causes to raise the total costs of house construction, which consequently results in the increase in the house price. Thirdly, when these higher profits and wages happen in the oil sector, then it is caused to shift these changes in some markets such as housing and increases its expenditures. In other words, the inflation caused from total expenditures increment is compensated through imports in tradable sector while the compensation does not happen in non-tradable sector by imports. Hence, the intensity of the house price increase is exacerbated (Abbasinejad and Yavari 2009, pp. 62-68).

Alternative Markets of House Commodity

Financial markets and some assets like foreign currency, and gold are substitutes of house commodity. The price change of any of these alternatives can shift demand of house commodity and investors portfolio (Gholizade and Kamyab 2008, pp.58).

Inflation

Since inflation generates uncertainty for resource allocation, it can be considered as the main variable among the nominal variables. There are various views about inflation and its definition in the relevant literature. Uncertainty of future prices leads to interruption in policy making for investment and saving, because of incorrect prediction of real and nominal values (Mohammadi & Taleblo, 2010). The rise of public price levels has different effects: its negative effect decreases people purchasing power and its positive effect works in a manner that when the households see that the flow of price rates is volatile they decide to stabilize their assets and look for opportunities that have more return rate of capital. Thus, investment in house sector may be one of these opportunities (Abbasinejad and Yavari, 2009).

Liquidity

Liquidity shocks are one of the stimulus factors of financial assets that cause financial

instability. Therefore, allocating appropriate volume of money given the need of society is an important issue that monetarism theories consider positive relationship between volume of liquidity and price of property and particularly price bubbles of the property (Gholizade and Kamyab 2008, 56).

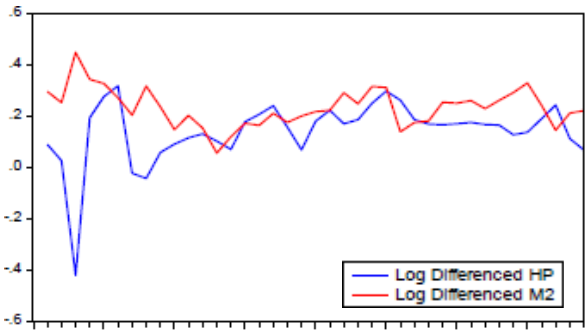

Figure 2.1. Trend of logarithm of House price and Volume of Money (M2) indices in Iran during the period

3. THE LITERATURE REVIEW

Naji et al. (2010), using the GARCH model and employing the Johansen-Josilous approach in order to estimate the model coefficients, found that volume of money, Consumer Price Index (CPI), GDP and exchange rate have a significant impact on the volatilities in the long run.

Bonnie (1998), using the vector auto regressive technique, examined the effect of four key macroeconomic variables on the housing sector nationally and regionally. The results from decomposing the volatilities variance show that the macroeconomic elements, especially employment rate and interest rent rate of housing sector, have a significant impact on the volatilities.

Lastrapes (2002), by using the general equilibrium pattern, tried to appraise the dynamic reflect of house price relative to the shocks of supply of money. Finally he confirmed a positive and significant effect on the volatilities.

Neukirchen and Lange (2002), investigated the impact of some macroeconomic variables such as long run interest rate, household income, gross domestic products, exchange rate, and population in increasing the price of house sector. His findings demonstrate that population deviations have the biggest impact on the house price while the interest rates are not effective paradigms for explaining the increase in the house price.

Ortok and Terrones (2005) studied the dynamic traits of international house price, interest rates, and macroeconomic variables in the industrialized countries. Their results show that although the macroeconomic variables, including investment and consumption at the house sector don not have an effect on the house price volatilities but the house price has a significant impact on the macroeconomic variables.

Selim (2008) by employing two artificial neural networks and hypothetically examined the main determinants of house sector in the Turkish urban and rural areas. He found that water system, size of rooms, local traits, pool and housing type have a significant effect on the house price. Moreover, he claimed that artificial neural networks approach is the best model to forecast the Turkish house price.

Gimeno and Martinez-Carrascal (2010), attempted to study the relationship between the house price and house mortgages in Spain according to the VECM model. Their estimates state that two respective variables have a correlated relationship to each other in the long run.

4. EMPIRICAL RESULTS

Modeling volatilities

Examining the stationary level of main variable, house price, is the first step before modeling the volatilities. The results gained from the Augmented Dickey Fuller (ADF) test; show that it is stationary after the first

difference with both intercept and trend at 0.05 significant level.

The two mean and variance equations of house price volatility are specified as follows:

Mean equation:

(1)

$$hpi = c_1 + c_2 hpi(-1) + c_3 hpi(-2) + c_4 hpi(-3) + c_5 v(-1) + u_t$$

and Variance equation:

(2)

$$\log(garch) = c_6 + c_7 \left| e(-1) / (\sqrt{garch(-1)})^2 \right| + c_8 \left| e(-2) / (\sqrt{garch(-2)})^2 \right| + c_9 e(-1) / (\sqrt{garch(-1)})^2 + c_{10} \log garch(-1)$$

Where *hpi* is the house price; *vt* is the first lag of residual; *garch* is the housing sector volatilities; term *e* indicates the residual component of model. Thus, in order to quantify these volatilities under the E-GARCH model, the following output of E-views is shown:

Table 4.1. Quantifying the Housing sector volatilities under the E-GARCH Model

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	15.46333	23.91319	0.646644	0.5179
AR(1)	0.448116	0.111508	4.018680	0.0001
AR(2)	0.252297	0.075550	3.339479	0.0008
AR(3)	0.278785	0.098040	2.843578	0.0045
MA(1)	-0.322820	0.161308	-2.001272	0.0454
Variance Equation				
C(6)	0.298060	2.89E-05	10323.10	0.0000
C(7)	1.031635	0.028190	36.59516	0.0000
C(8)	-1.259251	0.001545	-815.1264	0.0000
C(9)	0.306743	0.149306	2.054458	0.0399
C(10)	0.967691	0.021353	45.31854	0.0000
R-squared	0.402440	Mean dependent var		7.466667
Adjusted R-squared	0.306404	S.D. dependent var		7.693740
S.E. of regression	6.407533	Akaike info criterion		4.426235
Sum squared resid	2299.163	Schwarz criterion		4.758001
Log likelihood	-136.0658	Hannan-Quinn criter.		4.557332
F-statistic	4.190497	Durbin-Watson stat		2.773888
Prob(F-statistic)	0.000356			

Applying the Engel Granger Co-integration Approach

At this part of the study, in order to specify the main determinants of the house price volatilities, we applied the Engel Granger co-integration approach because all variables were stationary at the first difference. Additionally, because the stationary order of residuals terms is zero, thus the co-integration approach is offered. Eventually the model is specified and estimated as bellow:

(3)

$$VOL_t = C_0 + C_1 COIN_t + C_2 M2_t + C_3 GDP_t + C_4 H_{rate_t} + C_5 INF_t + U_t$$

Table 4.2. Estimating the model coefficient under the Engel Granger Co-integration Approach

Variable	Coefficient	t-statistic	prob
C	28.28938	2.77920	0.0098
COIN	-0.647056	-8.628177	0.0000
M2	0.26	3.721892	0.0009
GDP	-0.288417	-2.843948	0.0084
INF	1.661492	1.895837	0.0687
H_{rate}	-1.079087	-2.991212	0.0059

Source: Author's findings.

As it is seen in the Table 4.2, the coin, M2, GDP, INF and H_{rent} indicators have a significant impact on the house price volatilities under their gained probabilities values. Coin price variable as a substitute commodity of house commodity indicates that where its value increases 1 percent, it is caused to decline house volatilities about 0.647 percent on average. Volume of money proxy is the second investigated variable; its value indicates that where this proxy inclines 1 percent, it raises the volatilities about 0.26 percent on average directly. The relationship between the volatilities and GDP proxy is negative so that when the Iranian economic growth increases, it means high rate of house production, and as a result lower price and finally little volatilities. As it is shown, the symptom of inflation rate variable relative to the volatilities is positive and significant so as where the inflation rate rises 1 percent it lets volatilities to be extended near to 1.66 percent on average directly. Eventually, the sign of house interest rate to the volatilities is negative and significant. In other words, where the rate increases, it sparks the house price volatilities close to 1.07 percent on average.

5. CONCLUSION AND RECOMMENDATIONS

This study attempted to examine the effective determinants of house price volatilities using the Engel Granger co-integration technique

after modeling the house price volatilities under the E-Garch model for the period 1973-2008 in the Iranian economy. According to the results gained from the co-integration approach and examination of the main determinants on the house price volatilities, it can be concluded that all investigated variables including coin price, GDP proxy, volume of money, inflation rate, and house interest rate have a significant impact on the volatilities.

The symptom of the liquidity variable was positive. Thus, the sign indicates that the central bank of Iran as the responsible economic body has not been able to control the liquidity which resulted from the considerable earned oil reviews during the period. Because the Iranian government has intense dependency on oil revenues and since the Central Bank of Iran is not a separate part from the government structure, the role of liquidity control has not been accomplished appropriately. Moreover, the permanent inflation problem of Iranian economy confirms this reality theoretically. Besides, the outputs come from the model estimates show that the inflation rate is another influential factor that is affected by the lack of liquidity control on the economy. Hence, it is recommended that the officials pay more attention to the matter of liquidity control and try to separate the Central Bank from the government structure if they want a more efficient monetary apparatus for the economy.

There are several alternative markets such as exchange market and financial market for the house commodity. Here we considered the coin market as a substitute for the house commodity. The relationship between this alternative market and volatilities proxy was negative and significant. The reason behind the negative symptom goes back to the instability of alternative markets. It means the importance of the Western sanctions imposed in recent years besides the weakness of government supervision in addition to the speculating role of the intermediate individuals which has a negative impact on the markets in Iran. All these issues are caused to enhance the volatilities through replacing the liquidities within the markets in order to gain more profits. Thus, controlling the fluctuations by the government supervision and interaction with the Western powers can create more stability and confident in the markets and prevent destructive speculations.

The house interest rate is the other negative and significant variable which has an effective impact on the volatilities. The rise of the interest rate in this market is caused to reduce the number of useless roles of the intermediates and finally decrease the volatilities in the house market. This is while a change negatively in the interest rate has a positive influence to absorb the individual intermediates and liquidity of the other markets.

Eventually, pertaining to the gross domestic products variable symptom, it can be said that increase in the GDP means grater supply of the commodity and therefore lower price. As a result, uncertainty in lower prices is less than the upper prices.

Recommendation for the further research can be directed as follows: to consider the other substitute markets like exchange and financial markets for the house commodity in the model, to employ the other form of volatilities patterns including TGARCH; ARCH; ARMA in the model and to examine the effect of house volatilities on the Iranian economic growth which has been modeled by the Classics, Neoclassic and the Endogenous Growth models.

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