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The study of correlation between exchange rate volatility, stock price and lending behavior of banking system (Case Study Maskan Bank)

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Abstract

Since many economic sections especially housing section requires getting loan from banks, changes in bank lending behavior due to changes in key economic variables may encounter their enterprises with serious hazards.Therefore, in this study lending behavior in Maskan Bank during the period 1991-2011 was modeled, using(VAR) model. The results of estimated long-term VECM model, showed that among key economic variables, changes in total money supply, inflation rate, exchange rate and stock price volatility in long term, has an inverse effect, and changes in exchange price has a direct effect on in Maskan Bank lending behavior . Also the results showed that in estimated short-term VECM(Vector Error Correction Model) model, Changes in total money supply, in short-term, has a direct effect, and inflation rate, exchange rate and fluctuations in stock price, has no significant effect on in Maskan Bank lending behavior . Thus, according to the results of this study, based on lending behavior effect in Maskan Bank from Volatility of key economic variables, it is suggested that experts and authorities in housing action, consider the findings of this study to meet appropriate decisions.

Keywords: exchange rate, volatility of stock price, Maskan Bank lending behavior , Vector Error Correction Model. (VECM)

1.Introduction

Banks are one of the most important investment institutions, mobilization and allocation of financial resources and this role has made them as an effective factor in economic development. However, it should be noted that there are certain capacities for banks to mobilize financial resources and allocate them to investment. Regardless of the source of income or economic policies in Iran, the willingness of banks to distribute loans and their privileges to their many clients, are in crisis (Olokoyo2011).

Lending, which can be short- run, mid-run or long- run, is one of the services banks provide for their clients. In other words, banks lend to individuals, economic institutions and government to enable them to invest and expand their enterprises and thus they particularly help growth of a section and generally help economic development of Iran. It is accepted by everyone that banks play a crucial role in economy. Banks are expertise in meeting financial problems of society due to valuable information from borrowers. So it is not surprising that bank lending cuts encounters private section with problems. For example, small institutions not efficient enough in a short run or can't attract confidence to get loans, are severely affected by any changes in bank lending behavior. On the other hand, economic variables behavior in housing section, especially financing, are affected by macroeconomic conditions, and also have significant effects on downward trends and economy development . housing finance is a major component of housing market, and is important economically and socially.

On one hand, banks and banking system allocate part of its assets to currency, and on the other hand growth of the national currency against foreign currency relates with exchange rate volatility(Shaygany and Abdullahi Arani, 155,2011). Thus it is so important to do a study in order to investigate the relation between exchange rate volatility, stock price and Maskan Bank lending behavior.

Socially, issue of housing for low income households and how to finance them, as they can't afford residential units, is one of government's major challenges in housing section. economically, market mortgage rates, the volume of funds and facilities devoted to this section, directly affects the supply and demand for housing. Moreover, financing housing section and the volume of investment in this section, has had a significant effect on housing price and macroeconomic variables, particularly consumption. And on the other hand, macroeconomic and financial conditions also affect prices and financing. Therefore, a study should define interaction between lending behavior of Maskan Bank with other factors, and also influence lending behavior of this Bank from other factors, and that is so important.

2.Research Background

In recent years, advances in the field of science and technology, especially in the financial system and financial and monetary institutions, founded a great evolution and is the origin of changes in attitudes and behavior towards the environment. (Saidi, 2009,193-167).

The lending behaviour of banks is crucial for the transmission of monetary policy in Nigeria mainly because of the elevated function which the banks play in conveying monetary policy impulses. Exchange rate is pivotal with respect to determining money supply in Nigeria for the fact that monthly monetization of the foreign exchange earnings is a major source of funding for government expenditure. (Mbutor, 2010,252).

Housing finance system in Iran, is based on banks, so it has several limitations including: maximum facility, fix rate, repayment time limits, and imbalance of facilities with collateral value. Finance market in Iran generally concludes money market, which is a short market, due to non-spreading and deepening capital market. (Kiumarsi, 2005,22)

Gerlach and Peng investigated the correlation between residential building prices and bank lending in Hong Kong: They considered this study noticeable for three reasons: First, swings in property prices have been extremely large and frequent in Hong Kong. Second, under the currency board regime, monetary policy can not be used to guard against asset price swings. Third, despite the collapse in property prices since 1998, the banking sector remains sound. While the contemporaneous correlation between lending and property prices is large (Gerlach,2002,1).

Tsatsaronis and Zhu investigated importance of mortgage in housing prices fluctuations in 17 nations. Their results showed that the key variables related to mortgage mainly banking facilities and the real interest rate, explain almost a third of long-term fluctuations in housing price.

The main point is that in micro-credit program, the issue of employment and poverty reduction are so important. Micro-credit mechanism aims to create a new small business unit or develop it, that in the first case, to supply fixed capital, and consequently create at least one job opportunity for the operator of that unit, and in the second case, to provide working capital, and to reduce production cost.(Gomez and Santor, 2003)

Thus, micro-finance on one hand provides social and financial services that develops social capital, and on the other hand, using appropriate methods and good supervision, reduces poverty and social exclusion. Thus providing micro-credit to employees, and rural farmers as a strategy, can reduce poverty and increase overall development. (Hassanzadeh et al, 2006).

Before Islamic Revolution in Iran, housing was the first and second projects. No special period and credit was allocated to it. Since the third project housing mattered in five - year terms. After Islamic revolution, there were no more constrains in urban development.(Ahari,1996)

In a study, Amidu investigated the correlation between monetary policy and bank lending in Ghana. The results showed that bank lending behavior in Ghana is significantly affected by economic enterprises of the nation and changes in the money supply.

In a study using national data from America , McGibany and Nourzad investigated mortgage as a mechanism through which interest rate can affect housing demand. The results of the study showed that, in the long-term, there is a negative significant correlation between housing prices and mortgage interest rates. However, when in the short term, the variables "income" and "newly sold homes" enter into the model, the correlation is not negative anymore.

In a study using data of commercial banks and instability of macroeconomics in period of 1996-2005 , Somoye and Ilo investigated the unstable macroeconomic variables on bank lending behavior in Niagara banking section. The results of the study showed that bank lending has a long-term correlation with unstable macroeconomic variables, using integration and framework of vector error correction model(VECM). Thus this study suggests that as banks should consider Specific characteristics of the short-term and long-term lending enterprises, their concern the instability of macroeconomic variables should be limited to long-term results of lending behavior.

In a study, using a vector error correction model, Zare and Rezaie recognized and explained the effects of three markets; currency, coin and housing based on price index of Tehran stock exchange during the fourth quarter From 1995 Since 2003. The variables to be used are: stock price index logarithm, exchange rate logarithm, gold coin price logarithm, and housing price index logarithm in Tehran. the result of model estimation shows that the variables of housing price index logarithm and gold coin price logarithm have a direct correlation and variables of exchange rate logarithm and stock price index logarithm have a significant diverse correlation in the confidence interval of 95%. Also estimation of vector error correction model shows that about 43% of imbalance can be adjusted in each period.

In an article using vector error correction model, Naji Meidani et al. (2010), investigated the dynamic effect of some macroeconomic variables such as; money, gross domestic product(GDP), consumer price index(CPI), and exchange rate on behavior of housing price index, in Iran. The results using long-term Johnsson-Jvsylyvs convergence method, based

on the data during the period of 1990-2007 showed that all these variables have a significant positive correlation with housing price index. Analyzing anticipation error variance showed that until fifth period, a lot of these changes in housing price will be justified by this variable, and with increasing of interval periods, variables of GDP, exchange rate, money and CPI, will affect the increase of house price index. House price index equals one Standard deviation as an increasing index in the mentioned variables, and after 10 periods, it will have a stable level. Error correction coefficient is statistically significant, -0/17. Thus, in each period, about 17 percent of the imbalance in housing prices can be modified. According to nature of housing section in Iran, slow adjustment seems quite reasonable.

In a study titled "An analyze about housing lending role in rural development,(case: rural district of Seyed Ebrahim Dehloran) ", the policy of "rural house lending", Afrakhte and Havasi (2011), analyzed success, reasons and effective factors. The case study is rural district of Seyed Ebrahim in Dehloran. Due to the structure of this rural district, 60 households were randomly selected as sample study, and the questionnaires were completed by meeting them in person. The data was analyzed and conducted according to descriptive statistics and comparative study. The results show that rural lending policy has not been successful enough, as it has not been systematically and comprehensively planned for rural development. It is not either consistent with empowerment goals. So the most important strategy to achieve rural development is empowering the society with regional and human potential.

Reviewing domestic and foreign researches shows that, in Iran no study has been done about the consequences of stock price volatility and exchange rate on Maskan Bank lending behavior, so we are determined to do this study.

3. The Research Method

1-3. population and variables

In this study, the population is Maskan Bank which collects the data about endogenous variables (related to Maskan Bank) (1.total capital of Maskan Bank; A) , (2. ratio of deposits to capital; D/K), (3. ratio of mortgage payment to Maskan Bank capital; L/K), and exogenous data (unrelated to Maskan bank) (1. changes in total money supply; GM_2), (2. inflation rate; r), (3. exchange rate volatility; xrv),and (stock price volatility; si) for the period 1991-2011 according to Census Bureau, Maskan Bank data, Central bank databases of Islamic Republic of Iran.

In this study we used a model in which bank lending behavior is associated with two vectors of variables. The first vector relates topical factors and lending behavior, and the second vector studies macroeconomic environment affects on lending behavior. Therefore, the mathematical form of the model is as follows:

(1) $$L^s = \beta X_t + \hat{g} Y_t$$

So that:

L^s represents bank lending behavior of Maskan Bank, and is measured by the ratio of this Bank 's loan to its assets in a period.

X_t the vector of endogenous variables (related to Maskan Bank),

Y_t vector of exogenous variables (unrelated to the Maskan bank and macroeconomic variables are included),

β represents the coefficient vector of endogenous variables (indicating the sensitivity of Maskan Bank lending behavior to its variables).

$\hat{g}$ represents coefficient vector of exogenous variables(indicating the sensitivity of Maskan Bank lending behavior to macroeconomic variables).

Vectors X_t and Y_t variables are as follows :

A) vector X_t includes variables related to Maskan bank and determines its ability of bank lending (regardless of macroeconomic conditions). This vector includes Maskan Bank total assets (A), the ratio of Maskan Bank deposit to capital (D / K) and the ratio of Maskan Bank loans to its capital (L / K).

B) vector Y_t contains the exogenous variables (unrelated to the bank) and it includes macroeconomic indicators. This vector includes growth of money supply (gM_2), inflation rate (r), exchange rate volatility (xrv) and stock price volatility (si).

So the full form of the model used to investigate the effect of factors on bank lending behavior of Maskan Bank is as follows:

(2)

$$L^s = \beta(A, D/K, L/K) + \hat{g}(gM2, \hat{r}, xrv, si) + et$$

3-2 - Econometric models of vector auto regression (VAR)

When in a model the behavior of several time variables is examined, their interaction is important, too. One way to do this is to estimate the simultaneous equations model. If the equations contains variables interval, it is called dynamic simultaneous equation system model. In this model, some variables are endogenous, and some are exogenous or predetermined(exogenous plus endogenous with interval. Before estimating this model, it is necessary to ensure that the equations of this system are identified (or exactly identified) or over identified. So the researcher should recognize the type. It should be assumed that a number of predetermined variables exist in just some model equations. Thus two steps should be taken in advance First, model equations are classified into two categories: endogenous and exogenous. Second, to

recognize model type, there should be some modalities on variables coefficients. Such decisions are usually made optionally by the researcher, but has been seriously criticized by Sims(1980). The system of simultaneous equations usually have more than two endogenous variables and variables interval numbers are more than one. K is endogenous variable, and P is interval, so vector auto regressive model in matrix form will be as follows:

(3) $Y_t = a_1.y_{t-1} + \ldots + a_p.y_{t-p} + u_t \quad u_t \sim IN(0, \sum)$, i=1, 2…, p

Y_t is variable model and interval, U_t is vector, K.1 is sentence error, A_i is matrix ,and K.K is model coefficients. System (3) is a modified form, for any variable y_t may be based on its own variable interval and other variables within the model. Therefore OLS is an efficient method for estimating the coefficients of each equation model, because, the variables on the right of the equation, are predetermined variables (Greene, 2002).

Usually when a vector model is estimated, all the estimated coefficients related to variables intervals, are not statically significant, but the coefficients based on F test, may statically be significant. In this study, economic methodology and vector auto regression known as VAR have been used to investigate the effect of explanatory variables on Maskan Bank lending. Vector auto regression is one of the most common time series model in numerous studies. It is a multi equation model which privileged simultaneous equation model for some reasons:

A) Using this model, we can assess long-term equilibration between variables, and obtain long-term coefficients.

B) Using this model, we can assess momentums effect as scheduled. To do this, it is necessary to calculate Impulse Response Function or IRF. In fact, this criteria is used to assess the dynamics of economic system. This criteria can affect momentum impulse, and its maximum effect after momentum occurs. The other criteria is Variance Decomposition that is briefly shown as VD. This criteria is used to determine each variable's contribution and consequently, the changes in other variables. Thus, policymakers can identify momentums effect on economic system, and use them in police.

C) Using this model, we investigated the cause and effect relationship the variables. Therefore, when long-tern ım is confirmed, we can estimate vector error correction model or VECM, and consequently assess cause and effect relationship (Granger cause) between these variables and other model variables. Well, it is also needed to assess the issues such as; stability, convergence, and optimal interrupt rank.To account fully for all sources of variation in the forecasts, we would have to revise the forecast variance to include the variation in the forecasts of the exogenous variables and the variation in the parameter estimates (Greene, 2002,578).

4. Results and Discussion

4-1- Static Evaluation and Response Functions

To estimate econometric functions, at first, time series static used in the model , should be tested and evaluated. Used variables in the model must have the feature of return to the mean. Therefore, in this study, to estimate vector auto regression(VAR), in Maskan Bank lending behavior, at first, stability or reliability of time series generalized, using Dickey Fuller unit root test, and then Schwartz - Bayesian criteria was assessed. Table 1 shows the results of the test on function of Maskan Bank lending behavior during the period 1991-2011:

Table 1: Results of unit root tests on studied variables

A			L/K			D/K			The dependent) L/A (variable		
Difference Rank	Dickey Fuller Static	Schwartz - Bayesian	Difference Rank	Dickey Fuller Static	Schwartz - Bayesian	Difference Rank	Dickey Fuller Static	Schwartz - Bayesian	Difference Rank	Dickey Fuller Static	Schwartz - Bayesian
DF	-12,7	6653	DF	-12,3	6453	DF	-11,3	5973	DF	-12,9	6789
ADF(1)	-12,5	6655	ADF(1)	-12,1	6455	ADF(1)	-11,1	5939	ADF(1)	-12,7	6788
ADF(2)	-12,5	6654	ADF(2)	-12,1	6454	ADF(2)	-11,2	5938	ADF(2)	-12,8	6787
ADF(3)	-12,7	6650	ADF(3)	-12,3	6451	ADF(3)	-11,3	5935	ADF(3)	-12,9	6783
ADF(4)	-12,3	6649	ADF(4)	-12,0	6450	ADF(4)	-11,0	5934	ADF(4)	-12,6	6782
si			xrv			r			gM_2		

Difference Rank	Dickey Fuller Static	Schwartz - Bayesian	Difference Rank	Dickey Fuller Static	Schwartz - Bayesian	Difference Rank	Dickey Fuller Static	Schwartz - Bayesian	Difference Rank	Dickey Fuller Static	Schwartz - Bayesian
DF	-13,1	6742	DF	-12,7	6540	DF	-11,7	6017	DF	-13,4	6877
ADF(1)	-13,3	6791	ADF(1)	-12,9	6587	ADF(1)	-11,9	6060	ADF(1)	-13,6	6927
ADF(2)	-13,2	6725	ADF(2)	-12,8	6523	ADF(2)	-11,8	6001	ADF(2)	-13,5	6860
ADF(3)	-13,1	6714	ADF(3)	-12,7	6513	ADF(3)	-11,7	5992	ADF(3)	-13,4	6848
ADF(4)	-13,0	6709	ADF(4)	-12,6	6508	ADF(4)	-11,6	5987	ADF(4)	-13,3	6843
Dickey Fuller test critical values at the 95% level by taking the generalized intercept value = - 6/52											
Dickey Fuller test critical level of 95% with respect to the generalized trend of the intercept value = - 8/24											

Reference: study results

The above table shows that the dependent variable (Maskam Bank lending behavior) is in static level. It also shows that explanatory variables used in the study(endogenous and exogenous variables), are static after differencing for one time . Thus, the total degree of explanatory variables in the study equals one. Because maximum Schwartz-Bayesian is obtained in difference rank of 1 and absolute t-statistics is larger than generalized Dickey Fuller critical value.

The results of studying optimal interval show that Akayyk, Schwartz-Bayesian, Hanan Queen statics has the lowest value in the first interval, and log likelihood test , has the highest value. Thus, all the above criteria indicate a lag in VAR model.

Therefore, based on conducted tests, VAR model is estimated as follows:

L/A= 28/182+2/124 L/A(-1) +1/571 D/K (-1) -1/236 L/K(-1)+ 4/452
6/24 3/13 4/12 -3/25 2/85
A(-1)+3/326 GM_2(-1) -1/296 r(-1)+1/965 xrv(-1)- 2/934 si(-1)
3/56 -1/23 2/12 -1/85
F = 261/110 , R2 = 0/9621 , DW = 2/12 , N = 21

To interpret the results, it should be noticed that primarily in estimates of equations, coefficients and percentage of respondents describing the model parameters, are not as important as single-equation methods, and it is not expected that estimated coefficients of variables lag, be statically significant. But the statistic F makes the coefficients significant. Thus, impulse-response functions and variance decompositions are used to analyze the results. The below table shows the response of Maskan Bank lending behavior to a shock standard deviation in explanatory variables of study. In other words it shows that if a shock or a sudden change occurs as the size of a standard deviation in study variables, how Maskan Bank lending behavior will be in the next periods

Table2: response of Maskan Bank lending behavior to shock in different study variables

Period	xrv	r	GM_2	A	L/K	D/K	L/A	si
1	0/168	-0/182	0/294	0/596	-0/298	0/475	0/288	-0/512
2	0/124	-0/143	0/212	0/561	-0/271	0/402	0/261	-0/489
3	0/102	-0/112	0/168	0/503	-0/212	0/368	0/239	-0/441
4	0/086	-0/096	0/131	0/486	-0/196	0/321	0/201	-0/385
5	0/075	-0/073	0/102	0/421	-0/167	0/289	0/189	-0/326
6	0/023	-0/028	0/046	0/398	-0/102	0/221	0/124	-0/281
7	0/005	-0/008	0/011	0/331	-0/091	0/185	0/098	-0/221
8	0/014	-/019	-0/013	0/289	-0/069	0/134	0/076	-0/286
9	0/025	-0/028	-0/011	0/241	-0/036	0/096	0/032	-0/323
10	0/009	-0/011	-0/008	0/198	-0/015	0/067	0/011	-0/318

Reference: findings of the study

The findings f impulse-response function shows that a sudden shock in endogenous variables of the study(except the ratio variable of loan to capital), rises the ratio of loan to Maskan Bank's asset(lending behavior) and this effect gradually reduces. On the other hand, the effect of sudden shock in money supply changes shows that that this variable has a direct relation with Maskan Bank lending behavior in short term, and an diverse relation in long term. The effect of sudden shock in inflation rate shows that this variable has an inverse relation with lending behavior of banking network in Iran, in short term and long term. So that in short time the diverse effect reduces, and in long time it rises. The effect of sudden shock in exchange rate shows that this variable has an direct relation with lending behavior of banking network in Iran, in short term and long term and this direct relation reduces in short term and rises in long term. Finally the effect of sudden shock in stock price volatility shows that has an inverse relation with lending behavior of banking network in Iran and this diverse effect reduces in short term and rises in long term.

And also as the case study model concludes eight variables, there might be seven relation between them. To assess the test results, accumulation in intercept and trend in the vector co integration is needed. Appropriate model must be selected that in this case, five models were tested. All these models are evaluated, from the first one as the most useful till the fifth as the least useful, and the fourth one (with intercept and linear trend) is the best for accumulation analyze in this study. Also based on effect tests, and special maximum values, there should be an accumulation vector for model study.

4-2 - Estimating VECM model in long term for Maskan Bank lending behavior

As optimal interval for VAR model equals one, difference interval for variables in VECM model equals zero. In fact, in this study, Maskan Banks lending behavior in vector error correction model in long term, equals zero for impulse in variables difference. The table below shows the results of estimated vector error correction model(VECM), which represents normalized coefficients equation in optimal vector. It also shows loan variable ratio to asset ratio(Maskan Bank lending behavior):

Table 3: Results relation between VECM model and Maskan Bank lending behavior in long term

statistics t	vector coefficients Normalized	Variable
-----	1/0000	L/A(-1)
*2/8523	0/1124	D/K (-1)
*-2/6516	-0/0934	L/K(-1)
*3/9317	0/3294	A(-1)
**2/0185	-0/0134	GM_2(-1)
***1/8492	-0/0206	r(-1)
**2/0537	0/0183	xrv(-1)
**2/0813	-0/2083	*si*(-1)
*4/2543	7/9175	Intercept
* 3/6227	4/8137	Trend

Significant in level %1 ___ **Significant in level %5 ___ ***Significant in level %10 ___ *ns* non-significant

Reference: findings of the study

The findings of long-term VECM model shows that changes in total money supply variables (GM_2), has a negative sign and so is statically significant at the level of %5. It means that changes in total money supply in long term, has an inverse effect on Maskan Bank lending behavior. It can be justified that with change and growth of money supply, economic instability occurs in long term, thus Maskan Bank feels uncertain and tries to be more cautious in paying facilities. (inverse effect on lending behavior). Moreover, the coefficient of this variable shows that, in fixed conditions, if changes in total money supply has a rise of one unit, the ratio of loan to Maskan Bank's asset(lending behavior), has a fall of 0/0134 units. Also, variation rate(r), has a negative sign so is statically significant at the level of %10. It means that instability of inflation rate in long term has an inverse weak effect on Maskan Bank lending behavior. Similarly, It can be justified that with change and growth of money supply, economic instability occurs in long term, thus Maskan Bank feels uncertain and tries to be more cautious in paying facilities. (inverse effect on lending behavior). Moreover, the coefficient of this variable shows that, in fixed conditions, if changes in total money supply has a rise of one unit, the ratio of loan to Maskan Bank's asset(lending behavior), has a fall of 0/0206 units. Exchange rate variable (xrv) has a positive sign so is statistically significant at the level of %5. It means that changes in exchange rate in long term, has a direct effect on Maskan Bank lending behavior. It can be justified that with exchange rate growth, production

cost of businesses increases(due to increased cost of imported raw or intermediate materials), and thus there would be more demands for facilities in banking network of Iran). Moreover, the coefficient of this variable shows that, in fixed conditions, if growth (changes) in exchange rate has a rise of one unit, the ratio of loan to Maskan Bank's asset(lending behavior), has a rise of 0/0183 units. Finally, stock price volatility variable (si), has a negative sign , so is statistically significant at the level of %5. It means that stock price volatility in long term has an inverse effect on Maskan Bank lending behavior. It can be justified that, with stock price volatility, economic instability occurs in long term, thus Maskan Bank feels uncertain and tries to be more cautious in paying facilities. (inverse effect on lending behavior). Moreover, the coefficient of this variable shows that, in fixed conditions, if volatility has a rise of one unit, the ratio of loan to Maskan Bank's asset(lending behavior), has a fall of 0/21 units.

4-3 - Estimating VECM model in short term for Maskan Bank lending behavior

To correlate short- term volatility of changes with their long-term values, vector error correction modes(VECM), is used. The model is estimated by the following equation:

Table 4: Estimating VECM model in short term for Maskan Bank lending behavior

Statics t	Coefficient	Variable
1/8423***	0/2234	D(L/A(-1))
2/6452*	0/3059	D(D/K (-1))
-2/0816**	-0/1934	D(L/K(-1))
2/8963*	0/4764	D(A(-1))
1/8496***	0/1273	D(gm_2(-1))
-1/5321 ns	-0/1084	D(dr(-1))
1/6328 ns	0/0951	D(dxrv(-1))
-1/0793 ns	-0/3682	D(dsi(-1))
3/6981*	3/6519	Intercept
-5/6924*	-0/0914	ECM
Significant in level of 1% — ** significant in level of 5% — ***significant in level of 10% — *ns* non significant		

Reference: the findings of study

The findings of above table represents that impulse variable in total money supply changes (DGM_2(-1)), has a positive sign, so is statistically significant at the level of %10. It means that impulse variable in total money supply changes, in short term has an inverse weak effect on Maskan Bank lending behavior. It can be justified that with change and growth of money supply from Central (Markazi) Bank, Maskan Bank does not have enough time to response in short time and cannot significantly rise facilities supply. Moreover, the coefficient of this variable shows that, in fixed conditions, if total money supply changes, has a rise of one unit, the ratio of loan to Maskan Bank's asset(lending behavior), has a rise of 0/1273 units. Also, impulse variable in inflation rate changes (Ddr(-1)), has a negative sign, so is statically non - significant. It means that instability of inflation rate in short term, has no significant effect on Maskan Bank lending behavior. Similarly, It can be justified that with growth and change of inflation rate, Maskan Bank does not have enough time to response in short time. Impulse variable of inflation rate (Ddxrv(-1)), has a positive sign, so is statically non - significant. It means that instability of inflation rate in short term, has no significant effect on Maskan Bank lending behavior. Similarly, It can be justified that with change and growth of inflation rate, Maskan Bank does not have enough time to response in short time. Finally, Impulse variable of stock price volatility(Ddsi(-1)), has a negative sign, so is statically non - significant. It means that stock price volatility in short term, has no significant effect on Maskan Bank lending behavior. Similarly, It can be justified that, with stock price volatility , Maskan Bank does not have enough time to response in short time. Also if ECM coefficient is negative and its absolute value is smaller than one, the system will reach equilibrium in short term, and if ECM coefficient is positive, it shows that adjustments are divergent, and in each period, the distance from equilibrium path, will be as ECM coefficient value. The ECM coefficient represents if in short term a momentum enters the model, will system reach equilibrium in long term? The results in the above table represent that, ECM coefficient has a negative sign, so it is significant at the level of %1. It means that after one period, short-term model, reaches the equilibrium of 0/0914 units in long term.

5. Summary and conclusion

Results of static variables study using Dickey Fuller's generalized test showed dependent variables are static, and explanatory variables are static after they are differenced for one time. Also to determine the impulse optimal number, " AKayyk Schwartz-Bayesian, and Hanan Queen" tests have the minimum

statics value and "Likelihood ratio" test, has the maximum statics value in the first impulse, which indicates an impulse in the VAR model.

The findings of impulse-response function showed that a sudden shock in endogenous variables of study(except loan to capital variable) increases loan ratio to Maskan Bank's asset(lending behavior) and this effect gradually decreases over time. On the other hand, the effect of sudden shock in total money supply changes showed that this variable has a direct relation in short term and an inverse relation in long term with Maskan Bank lending behavior. Also, the effect of sudden shock in inflation rate showed that this variable has an inverse relation in short term and long term with lending behavior of Iran banking network. So that this diverse effect decreases in short term and increases in long term. The effect of sudden shock in exchange rate showed that this variable has a direct relation with lending behavior of Iran banking network, in long term and short term, and this direct effect decreases in short term and increases in long term. Finally, the effect of sudden shock in stock price volatility showed that this variable has an inverse relation with lending behavior of Iran banking network, and this diverse effect decreases in short term and increases in long term.

The results of effect tests and maximum values, showed that there is an accumulation vector for case study model and the fourth model(with intercept and linear trend) was selected as the best model.

The results of estimated long-term VAR model(normalized VECM), showed that if in long term, total money supply changes, inflation rate, exchange price changes, and stock price volatility have a change of 1 unit, the loan ratio to Maskan Bank's asset(lending behavior), respectively changes as -0/0134, -0/0206, +0/0183 ,and -0/0208.

The results of estimated short-term VECM model showed that if in short term the difference of total money supply changes, have a change of 1 unit, the loan ratio to Maskan Bank's asset(lending behavior), increases as 0/1273 units. Also, inflation rate difference, exchange rate changes difference, and stock price volatility difference in short term has a non-significant effect on loan ratio to Maskan Bank's asset(lending behavior). Moreover, ECM coefficient has a negative sign and is significant at level of % 1. It means that after a period of short-term model, it reaches the equilibrium of 0/0914 in long term.

6. Suggestions

Since many economic sections especially housing section requires getting loan from banks, changes in bank lending behavior may encounter their enterprises with serious hazards. The results of this study show that bank lending behavior in long term is influenced by fluctuations in macroeconomic variables, such as: total money supply, inflation, exchange rate, and stock price. It is suggested that experts and authorities in housing section, consider the findings of this study to meet appropriate decisions. Moreover it is suggested that researchers in bank sections, consider the presented model in a more widespread issue of endogenous and exogenous variables. This way they can continue this study path and also notice a native model in estimating Maskan Bank lending behavior.

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