The effect of monetary policy on price bubble in the Tehran Stock Exchange

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Abstract: Monetary policy refers to some processes by which financial experts change the general liquidity of economy through the available legal mean in order to stabilize the price level and decrease the gap between actual and potential output. Moreover, the deviation of stocks value from its long-term balance value is called bubble. The impact of monetary policies on the bubble in Tehran Stock Exchange as well as the behavior of investors from 2009 to 2013 was reviewed in this research. All the estimations of the predicted model were made in Eviews6. Furthermore, the estimation of model was performed with the regression of Ordinary Least Squares (OLS). Study results showed that the volume of money had a positive impact on the stock market bubble in Iran, where as quasi money had negative impacts on it.

Introduction

Monetary policies and partial liquidity changes are the important tools which politicians would use to improve economic indicators. However, they act shockingly and bring many problems such as high inflation. In such circumstances, monetary markets act like shock absorbers and protect real variables. Monetary markets can downsize through shock in a large scale, and also change this force in some part of economy indicators through decreasing the price of capitals and turning it into an efficient force. On the other hand, it is only possible to use monetary and financial policies in monetary markets. It has always been highly important to study the capital market as the main concentration point of researchers because some people believe that the economy of capital market is the economic heart of a country, so its fluctuations would influence the country's economy (Momeni and Ghayoomi, 2012).

One of the controversial topics of economy is that whether the development and expansion of capital market would result in economic growth or not. In other words, can the capital market measure and evaluate the economic activity? From the traditional perspective, capital market is a predicting economic index, and many people believe that high decrease in stock price will lead to a fall in the future, while its rise will result in economic growth (Tabrizi, 2004).

Considering the strategic, monetary and economic importance of stock market, it will be really difficult to move and distribute the monetary resources of the country at the time of a large deviation and perturbation. The stock market reflects the economy of country. However, today the economy has been disconnected from the stock exchange in many developing countries. One of the factors involved in creating these fluctuations in the price of capital and creating the bubble, in particular, is stock price. Price fluctuations are considered to be deniable part of the market; however, these fluctuations sometimes become unusual. Being replaced with the sudden increase or decrease, they may cause irreversible damages in stock exchanges. Nevertheless, the important problem is the unusual quality or quantity of these fluctuations. Generally, fluctuations in the price of capital include two parts:

1. The traditional section and basic price changes which are influenced by macro variables or traditional changes in supply and demand.

2. Non-traditional sections or false price changes which are called speculative bubble in the stock market (Tabrizi, 2004).

The economists defined bubble in the most common way as follows: the price increase resulting from increased expectations which would attract new purchasers, so negative expectations and severe price reduction causing the monetary crisis would result from such increase. The basis and essence of a price bubble is based on the interaction which occurs in response to the price increase. Therefore, price increase would encourage the investors more and elevate demands, so the prices would rise again. Increased demand for the capital results from public

mentality about high security in the past and their optimism on gaining more interest in the future. This feedback is price increase which would make the prices exceed the natural level once again (Fish Butcher *et al*., 2013).

Research Objective

The research aimed at studying the impact of monetary policies on bubbles in Tehran Stock Exchange and the behavior of investors (tendency towards investment).

Literature Review

In a study titled *The Impact of Financial Information Transparency on the Behavior of Shareholders in Taiwan Stock Exchange*, Hisu (2006) investigated the role of transparency dimensions of financial information in increasing the amount of investment in market. The results showed a significant and positive relationship between the investors' perception of transparency dimensions of financial information and their behavior. Transparency of ownership structure had the greatest impact among all transparency dimensions. Moreover, the investors' perceptions of transparency dimensions are different, given their demographic variables, and there is a positive significant relationship between experience in stock investment and their behavior. In another study titled "*How do American and Japanese Shareholders Process the Information and Behave in Accordance with Their Expectations of Future*", Hisu evaluated the efficiency of capital market and its impact on the expectations of investors. The results indicated that the expectations of shareholders were more in efficient markets, and they paid more attention to the presentation of more information on companies. Given this information, they would determine their investing strategies and decisions.

In a study titled *The Theoretical Views of Beneficiaries about Organizational Performance and the Impact of Informational-Communicative Technology: Conceptualization and Model Test*, two researchers investigated the relationship between information and communication technology and its impact on financial and non-financial performance of the company. Their results showed a positive relationship between informational-communicative technology of company and its financial and non-financial performance. Given this result, the companies which could collect the necessary information in the best way and provide the shareholders with it had better financial performance. This indicated the tendency and behavior of shareholders (Dimowski & Eskerlavach, 2004).

Blanchard's theory of rational bubbles (1979) indicated that the asset price might vary from the fundamental values of market in spite of John Muth's rational expectations (1691). The growth of rational bubbles would reflect the existence of self-increasing expectations resulting from future rises in asset price. These bubbles are the features of markets. It means the purchase of an asset by an investor- who can predict that another investor would also like to purchase the same asset at a higher price to resell it at a higher price.

Hamilton and Whiteman (1985) proposed a type of empirical strategy for stability tests in order to investigate the existence of explosive rational bubbles without any possible deterrence impacts of invisible variables on the fundamental value of market.

Using the models of conventional accumulation and threshold accumulation, Nans & D. A. Silva (2007) studied the existence of rational bubbles in 81 stock markets. According to the estimated results of both models, there were explosive bubbles in the stock markets in Chile, Indonesia, Korea and the Philippines, whereas there were collapsing bubbles in the stock markets in China, Brazil, Venezuela, Columbia, Chile, Indonesia, Korea, and the Philippines.

Arash Mirshamsi (1378) studied the importance of investment and capital accumulation in economic growth and introduced the local stock exchange for doing it. The researcher concluded that the existence of rational bubbles would reflect inconsistency of the two above-mentioned points. This study was meant to see whether this would occur in Tehran Stock Exchange and to explain its causes and prevention methods.

Koroush Moadelat (2002) explained the actual form of changes in stock price index and studied the existence of price bubble in Tehran Stock Exchange, using state-space method from 1999 to 2000. The estimations indicated the existence of price bubble in Tehran Stock Exchange from 1995 to 1998 and also from the middle of 1998 to 2000. In fact, the unexpected price changes intensified the likelihood of price bubbles in this market. Although some of the booms of this market can be explained by cases such as management changes, regional and commodity exchanges and so on, a considerable part is also related to the existence of bubble in this market.

Mehrani *et al*. (2008) evaluated the investors' under-reaction in Tehran Stock Exchange. Using short-term intervals, they assessed the hypothesis of under-reaction of investors in this study. Unlike many foreign studies, their results indicated lack of slow reactions and under-reactions of investors in Tehran Stock Exchange.

In their study, Nikbakht & Moradi (1384) evaluated the overreaction of ordinary shareholders to new information released in Tehran Stock Exchange.

Their results confirmed the overreaction of investors to new information released in Tehran Stock Exchange.

Research Hypotheses
Main Hypothesis
Monetary policies influenced the bubbles in Tehran Stock Exchange.
Subsidiary Hypotheses
1. The volume of money influenced the bubbles in Tehran Stock Exchange.
2. Quasi money influenced the bubbles in Tehran Stock Exchange.
Methodology
This is an applied regression analysis. The statistical population included all the companies listed in Tehran Stock Exchange from 2009 to the end of 2013. Their qualifications were as follows:
1. They should be continuously active in Tehran Stock Exchange, and at least 50% of working days of their stock should be traded.
2. The price fluctuations in the stock of these companies in Tehran Stock Exchange should be more than the entire market.

3. The financial information of these companies should be released in Tehran Stock Exchange.
The information of these companies was collected from Rahavard Novin and Tadbir Pardaz Applications. Using computer networks and library references, the subject was studied in the section of subject literature.
Research Model
OLS test was used in order to estimate the final research model. The general model is as follows:
BUB=f (MON, MSI)

Statistical Population and Sample
In this research, the statistical population included all the companies listed in Tehran Stock Exchange whose transactions did not stop more than 4 months. With this assumption, the number of companies was 27 in the statistical sample. They were all among the companies listed in Tehran Stock Exchange. Their three-month data of these companies between 2009 and 2013 was used in this study.
Descriptive Statistics

Table 1 – Descriptive Statistics for the Companies with Bubble

Variable	Number of Samples	Minimum	Maximum	Mean	Standard Error
BUB	27	-1965.55	4956.66	365.659	1603.769
MON	27	$1.06*10^2$	$5.6*10^2$	$2.9*10^2$	$1.4*10^2$

Data Analysis and Hypotheses Testing
1- The first stage of data analysis was to study the constant status and to conduct the unit root test for variables. The unit root test results were presented in Table 2. Most of macroeconomic time series are in line and move in the same direction. The reason is a procedure which is common in all of them. If the variables of time series which are unsteady are used to estimate the coefficients of the pattern, they may result in a false regression. It is because this trend is observed in the variables which bear this process so that they represent a strong correlation even in cases in which there is no significant economic relationship between them. Briefly, it can be said that if a linear combination of several unsteady variables with similar accumulation degree can be found to be steady, those variables are stacked. In this case, the pattern can be estimated through OLS method. Therefore, not only are the estimations faced with problems, but they are also efficient (Tavakoli, 1999).

Table 2 – Unit Root Test

Variable	Critical Values of Test	Dickey-Fuller Test	Results
BUB	1.86	3.68	BUB has one unit root in exogenous factors
MON	3.59	6.008	MON has unit roots in exogenous factors: it has a constant linear trend.

Table 3 – The Test Results and Estimation of Final Model

	All the Variables			Y– Intercept Separation			Exclusion of Irrelevant Variables with a value less than 1		
	Probability	Coefficient	t-static	Probability	Coefficient	t-static	Probability	Coefficient	t-static
MON	0.005	$4.82*10^{-6}$	3.04	0.007	$4.56*10^{-6}$	3.004	0.004	$4.61*10^{-6}$	**3.39
MSI	0.037	$-1.35*10^{-6}$	-2.46	0.026	$-8.86*10^{-6}$	2.39	0.015	$1.01*10^{-6}$	**-2.7
C	0.53	-1365.68	-0.68	-	-	-	-	-	-
R^2		0.36			0.35			0.34	
R.Adj		0.289			0.296			0.422	
F-statis		3.264			3.025			5.69	
Prp (F)		0.019			0.29			0.004	
D.W		2.5			2.5			2.39	
LM		0.1426			0.1423			0.24	
ARCH		0.79			0.63			0.79	
J-B		0.006			0.05			0.01	

The Results of Hypotheses Regression Testing

Given the table pertaining to the test of hypotheses, it is observed that the explanation coefficient R^2 of the first case indicated that independent variables justified 36% of the changes in dependent variables. Since R^2 was low, the model was tested after deleting Y-intercept constants.

In this case, the value reached 0.35. Then the model was tested with the tests of classic assumption after deleting the variables which were smaller than 1 and not related to t-statistics. In this case, the final model in which R^2 reached 34% was specified. It indicated that 34% of dependent variables were covered by variables such as volume of money, the nominal value of money and consumer price index.

The value of F-statistic was equal to 3.264 in cases where Y-intercept and irrelevant variables existed, and its probability was about 0.019 indicating the significance of the general model.

Moreover, the value of F-statistic was equal to 5.69 in the final research model, and its probability was equal to 0.004 indicating the significance of the final model.

Durbin-Watson statistic was equal to 1.5 with Y-intercept, whereas it was equal to 2.5 in the case where Y-intercept constant was deleted. However, after deleting irrelevant variables in the final model, it was equal to 2.39. Since 2.39 locate between 1.5 and 2.5, it could be stated that there was no correlation in the components of model.

The Results of Autocorrelation Test

To test whether the independent variables were auto-correlated or not, two hypotheses were considered as follows:

H_0 = There is no autocorrelation between variables.

H_1 = There is an autocorrelation between variables.

To test these hypotheses, autocorrelation test LM was used. According to the results mentioned in Table 1, no autocorrelation was observed between independent variables of the research.

The Results of Heterogeneity Test

To check the existence of heterogeneity, heterogeneity test was used in the model. Two hypotheses were considered as follows:

H_0 = There is no heterogeneity between variables.

H_1 = There is heterogeneity between variables.

To test these hypotheses, ARCH method was used in this research. As presented in Table 1, Hypothesis 0 was confirmed, so the model was not heterogeneous.

The Results of Normality Test of Model

To control the normality of model, the following hypotheses were considered:

H_0 = Model distribution is not normal.

H_1 = Model distribution is normal.

J-B (Jarque-Bera) test was used to check these hypotheses. According to the results in Table 1, Hypothesis 1 was confirmed. It means that the distribution of model was not normal. The model was normal when Y-intercept constant and irrelevant variables were deleted from the final model.

Summary and Description of Research Findings

At 95% reliability level, the research results on the hypotheses are as follows:

Table 5 – Summary of Findings

No.	Hypothesis	Confirmation or Refutation
Major	Monetary policies influenced the bubbles in Tehran Stock Exchange.	Confirmed
1	The volume of money influenced the bubbles in Tehran Stock Exchange.	Confirmed
2	Quasi money influenced the bubbles in Tehran Stock Exchange.	Confirmed

Recommendations

The above-mentioned results indicated that the variables of volume of money and quasi money influenced the bubble in stock exchanges. Since this market is new and many people are unfamiliar with it as the source of working capitals, it is suggested that monetary policies should pay special attention to this market in microeconomic planning. So the capitals of such people would enter the market.

1. The impact of monetary policies on other companies and institutes which are not listed in stock exchange along with basic and OTC market.

2. Studying the impacts of monetary policies on the price bubbles and behaviors of investors in Tehran Stock Exchange.

3. Studying the role of economic growth in price bubbles and behavior of investors in Tehran Stock Exchange.

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