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## THE STUDY OF THE EFFECT OF MONETARY POLICIES ON IRAN'S STOCK MARKET BUBBLE

Fatemeh Masoumi Soureh<sup>1</sup>, \*Rasoul Baradaran Hassanzadeh<sup>2</sup>, Mohammadreza Nahidi<sup>3</sup>

<sup>1</sup>Department of Accounting, College of Humanities, East Azarbaijan Science and Research Branch, Islamic Azad University, Tabriz, Iran

<sup>2</sup>Department of Accounting, College of Management Economics and Accounting, Tabriz Branch, Islamic Azad University, Tabriz, Iran

<sup>3</sup>Department of Economics, College of Management Economics and Accounting, Tabriz Branch, Islamic Azad University, Tabriz, Iran

\*Author for Correspondence

### ABSTRACT

This main objective of the present research is to investigate the effect of monetary policies on Iran's stock market bubble in the period 2001-2008 (in the form of quarterly data). All the model estimates have been based on using Eviews software, and model estimation has been done using Ordinary Least Squares (OLS) regression. The results show that money volume had positive effect on Iran's stock market bubble and quasi money and consumer price index had negative effect on it. And the long-term five-year bank deposit interest rate and sales volume of bonds had no effect on stock market bubble.

**Keywords:** *Monetary Policies, Bubble, Stock Market, Index, Stock Price Index, Money Volume, Quasi Money*

### INTRODUCTION

In economics, financial markets are as shock absorbers. If the shock of a hundred-billion demands is directed to financial markets, it can be adjusted with little and tolerable change in stock exchange index, or its effect on the actual body of the economy will be delayed (Momeni and Ghaiyoomi, 2012).

Monetary policies and liquidity changes are important tools, in the hands of politicians, for improving economic indicators. But they are as shocks which sometimes bring problems such as severe inflation with them and create problems in the part of real variables.

Under such circumstances, financial markets can act as shock absorbers to protect the real variables. In this way, in addition to adjusting the force by distributing the shock force on a large scale, financial markets can also change this force, by decreasing capital costs, into an effective force in the part of economic indicators.

From another perspective, the application of monetary and financial policy is possible only with the existence of financial markets. In other words, like financial and monetary policies which are as old as the history of discovery of money, financial markets, like commodity and labor markets, also exist in any economy. Regarding the performance of financial markets can reinforce positive functions and reduce its negative functions.

Studies in the area of capital market have always been of great importance and the main focus of attention by financial and academic researchers, because some people believe that capital market is the heart of the economy of a country and its fluctuations should be affected (Tabrizi, 2004).

One of the controversial issues in the field of economy is whether the development of capital market will lead to economic growth. In other words, can capital market measure economic activity? Capital market traditionally is considered as "predictor index" of the economy and many people believe that dramatic decline in the stock price represents a downturn in the future, and, conversely, its increase suggests economic growth in the future (ibid.).

Regarding the strategic, financial and economic importance of stock market, when a massive disruption and deviation occurs in it, the mobilization and allocation of financial resources of the country will be faced with a serious problem. Stock market is the mirror of the country's economy, but nowadays, in

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many developing countries, status and indeed the relationship between the economy and the stock exchange has been cut. One of the factors causing these issues is fluctuations in asset prices and especially the formation of stock price bubble. Price fluctuations are inherent component of the market, but sometimes these fluctuations are removed from their normal state and replaced by uncontrollable rising and sudden falls, and they cause irreversible damage to the stock exchange. However, the important issue here is the abnormal quality and quantity of these fluctuations. In general, fluctuations in the prices of financial assets are often composed of two main parts: one is the conventional section and fundamental price changes which is affected by the basic macroeconomic variables or conventional changes of supply and demands and the other is unconventional sections or false changes in prices which are known as speculative bubbles in the stock market.

There are many definitions for the term bubble proposed by economists, but the most common definition of bubble is increase in price due to rising expectations which attracts new buyers. Following these kinds of price increases, often negative expectations and sharp decline in prices will arise, usually leading to financial crisis (ibid.).

Indeed, the basis and essence of price bubble is based on a reaction taking place in response to increase in prices. Thus, increase in prices will lead to increase in investors' enthusiasm and increase in demand, and therefore, prices will increase again. Increase in demand for assets is the result of people's minds about high yield on securities in the past and their optimism about receiving high yield in the future. This is the feedback of increase in prices which causes the prices to increase again more than normal level.

The first research into stock market bubble has been carried out by Shiller (1990) under the title of "Are stock price changes dependent on cash dividend flow values of the present and the future or not?" Shiller, in this article, using annual data of the years 1871-1986 and Variance Bound Test concluded that changes in prices cannot be explained by changes in present value of cash dividend flow.

There has been much research done by researchers to investigate the effect of macroeconomic variables and monetary policies on stock market, stock market returns and stock price index both inside and outside the country, but the effect of these variables on bubble and stock market boom and deflation has not been investigated. In 2012, for the first time, Fischbacher and his colleagues investigated the effect of monetary policies on stock market bubble and business conduct in an experiential asset market.

In line with research done by Fischbacher and his colleagues, this research is trying to investigate the effect of monetary policies on Iran's stock market bubble and to answer the question: What is the effect of monetary policies on Iran's stock market bubble? In order to do this, the effect of money volume variables, quasi money, long-term and short-term bank deposit interest rate, sales volume of bonds and consumer price index on stock market bubble has been investigated, and the seasonal information variables of the years 2001 to 2008 has been used.

## **Research Background and Literature**

### **Research Literature**

#### **- Monetary Policy**

Monetary policy refers to the set of processes through which monetary authorities change liquidity of the whole economy, through available legal means, in order to stabilize the price level and reduce the gap between actual and potential production. To better understand the influence of money on the economy, it is necessary to review briefly the tools and techniques of the application of monetary policy and its objectives.

A: Volume of Open Market Operations: these operations refer to the set of processes through which the central bank, in order to change the money volume, makes changes in its portfolio and also changes the amount of bonds in its portfolio. We should bear in mind that the real strength and durability of an open market policy is, by the central bank, within the volume of bonds available in the society. Its effects are considered as direct, fast and therefore as an important and useful monetary policy tool.

B: Legal Deposit: To avoid irregularities in the money market and in order to have money volume controlled by the monetary authorities in most of the countries, banks are required to entrust a portion of the funds, that customers give them, to the central bank. Percentage of the funds that are legally required

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to be maintained by the central bank determines the amount of liquidity of high powered money by the following formula:

$$M_2 = H/rr$$

H: representing the monetary base

rr: representing percentage of bank deposits whose maintenance is legally required to be entrusted to the central bank.

C: Re-discount Facilities: In order to improve the efficiency of banking system and increase bank deposits interest, banks are able to borrow from the central bank. These borrowings are carried out with interest which is usually less than the interest available in the money market. This is the so-called re-discount.

The most important feature of this tool is that, by reviewing it, the central bank can simply understand the resultant of money market forces.

Its most obvious limitation is that it is considered as a passive tool which is not a good tool to control the money market.

#### *- Monetary Policy Tools in Iran*

How to determine monetary tools, or generally, policy tools, is also one of the important issues in a process of monetary policy making. Although in economic circles, independence of central bank in setting goals is less agreed, operational independence in determining monetary tools after setting goals has been almost agreed by economists and central bankers, and in this respect, proper monetary management requires independence and authority of monetary authority in the use and configuration of available tools.

In implementation of monetary policy, the central bank can directly use its regulation power or use indirectly the effect on the conditions of money market as emitting high-powered money (notes and coins in flows and deposits in central bank). Accordingly, there are two types of monetary policy tools:

Direct tools (not dependent on market conditions) including the control of bank interest rates and credit maximum and indirect tools (based on market conditions) which include legal deposit ratio, central bank bonds and also special deposits of banks in central bank.

#### *- Objectives of Monetary Policy*

The main objectives of monetary policy in economics can be summarized in acceleration in economic growth, full employment, stabilization of general price level and equilibrium in the balance of foreign payments. Due to discrepancies between some of the objectives, monetary policy alone cannot accomplish the above objectives, and fiscal policy also needs to be employed to achieve the objectives.

#### *- Factors Affecting Stock Price*

In an efficient market, the stock price in stock exchange is determined by the intersection of seller's supply and buyer's demand. In fact, there is no specific rule that explaining the behavior of the stock price, but there are several identified factors affecting the stock price changes whether upward or downward. These factors fall into three broad categories: fundamental variables, technical variables and emotional variables.

In another classification, factors affecting stock price can be divided into internal and external factors:

##### a- Internal Factors:

Internal factors include those factors associated with company operations and decisions made at the company such as earnings per share (EPS), dividend per share (DPS), ratio of price to income, capital gain, stock splits and ...

##### b- External Factors:

External factors include those factors outside the company's management authority which affect the company's activity. These factors can be divided into two categories:

1- Political Factors: factors such as interruption of political and economic relationship with other countries, war, peace, change in political organs, the rise of rival political parties and ... are issues that have a major effect on stock prices.

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2- Economic Factors: affect stock market boom and deflation so severely that during the economic boom, investment in stocks of firms with growth will increase, and this will lead to the increase in their stock prices (Gujarati, 1999).

#### - Definition of Rational Price Bubble

Several definitions have been proposed for price bubble and some of them are mentioned in the following:

1) In the economics literature, deviation of the commodity price from its long-term equilibrium price is called bubble. In fact, when the commodity or service price is different with its expected price in the future, the subject of bubble is discussed. In other words, if the commodity price is higher than its intrinsic value, it is said that there is a rational bubble.

2) The deviation of stock value from the long-term equilibrium value is called bubble. In order to exactly understand the phenomenon of bubble, first, the intrinsic value as the present value of expected returns from holding a share is defined as follows:

$$P_t = \sum_{i=0}^{\infty} a^i E_t d_{t+i} \quad a = \frac{1}{1+r}$$

$$\bar{P}_t = P_t + b_t$$

$P_t$  is the intrinsic value of stock price,  $\bar{P}_t$  is the current value of stock price and  $b_t$  is the bubble. As the above equation shows, if the current value of stock at time (t) is greater than its intrinsic value, the difference between these two is due to bubble ( $b_t$ ) (Abbaszadeh, 2007).

3) Campbell and his colleagues (1997) stated that rational bubbles indicate that stock price and dividend should not be co-integrated. The economic concept of co-integration refers to a situation in which two or more variables of time series are associated with each other based on theoretical basics in order to form a long-term equilibrium relationship- although these time series may have a random process (to be stable), over time they follow each other well so that their difference is stable.

4) In stock market, the intrinsic value is equal to the present value of all future cash flows or dividends. In this market, bubble means possible deviation of stock price from its intrinsic value.

5) Margaret and Gary stated that bubble refers to a situation where the market price of an asset exceeds its present value of expected cash flows.

#### - The Famous Price Bubbles

#### - The Great Crisis of 1929

This crisis which began in the early days of October in the U.S. and spread to most domains of West until about 1933 is known as the great crisis due to its extent and extensive damage. It is undoubtedly the most critical crisis which the capitalistic world has ever faced. This crisis began with the collapse of New York Stock Exchange on October 23rd. On this day, reduction in stock value which had begun since October tenth, led to the sharp increase in stock supply so that about 13 million shares were traded on that day. Excessive stock supply to the market caused the prices to fall further in the market. On October 29th, more than 16 million shares were traded, while the average of traded shares, on the days before the crisis, barely reached 4 million shares. From October 23<sup>rd</sup> to October 29<sup>th</sup>, all one-year return on stock market was destroyed. And finally, the stock market index fell more than 89 percent. In order to prevent excessive fall of the market, trading was very limited by NYSE (New York Stock Exchange) officials. They also limited trading hours to three hours per day.

The collapse of the U.S. Stock Exchange had coincided with the economic recession in the U.S. so that production indices, the whole prices of sales of goods and services and the individual income index, during two months of October and November, decreased 20, 5, 7 and 5 percent respectively. And this reduction continued during a year later so that these indices had decreased 26, 14, 16 percent respectively in October 1930 compared to November (Abbaszadeh, 2007).

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Despite the increase in indices since 1926, the collapse of New York Stock Exchange undoubtedly indicated the ailing economy and economic recession of these countries, but the occurrence of it also triggered the ailing status of the economy. The stock exchange crisis was drawn to the U.S. banks which were the foremost providers of capital of speculators who were active in the stock exchange. It also brought a chain of bank failures. In November 1930 a total of 256 banks and in December of the same year 352 banks, due to the influx of people to receive their deposits, were declared bankrupt, and one of them was the “U.S.” bank which was the largest commercial bank of the United States at that time. People considered their financial losses as the result of deception of those involved in the firms. After the first downturn, the U.S. Stock Exchange was involved in the crisis for three years, and the Dow Jones index reached its minimum, i.e. 41 units in 1933, and it took 25 years to reach its primary level, i.e. 381 units.

The great crisis gradually spread to all Europe and even all the world (except the Soviet Union and Eastern Bloc). The severity of the crisis was so much that economists of the time considered it as the inevitable end of capitalism, but the leaders of capitalism had also responsibilities. Teachings and practice of the recession period then and now has formed much of the economics. The teachings which prescribe government intervention in the economy and consider reformed economy as the important issue of economy. The experience gained in dealing with the crisis in these years, later and in dealing with other crises such as the crisis of 1987, greatly assisted the economic officials of developed countries.

#### **- The 3000-percent dividend of 3M Company**

In 1994, a Russian speculator called “Sergei Mavrodi” after founding 3M Corporation declared that he pays 3000 percent of dividend to stockholders! At the beginning the company was very successful. The stock price of the company reached 51 dollars (105,000 rubles) in July 1994 from 1 dollar (1600 rubles) in February 1994. The number of stockholders of the company had reached 10 million, and the number of its branches across Russia had reached 140 agencies. Interestingly, the company did not perform any productive activity or services. The Russian government and even Boris Yeltsin warned people about the company’s profit, but the company’s dreamy profit, especially during the economic recession in Russia, had sent crowds of people to the company’s agencies until the company finally faced bankruptcy. The amount of the company’s debt to people was so much that a state of emergency was declared across the country, and in some areas conflicts occurred.

### **Research Background**

The first research on price bubble in the stock market has been conducted by Robert Shiller (1981) with an article entitled “are stock price changes so much that cannot be associated with dividends?” Shiller, in this article, using annual data of the years 1871-1986 and Variance Bound Test or the excessive volatility of prices concluded that changes in prices cannot be explained by changes in present value of cash dividend flow. However, before Shiller, some research into hyperinflation in Germany has been carried out by Flood and Garber (1980) under the title of “the fundamental value of the market against price bubble”. In this research, Flood and Garber has used the statistical data of the years 1919-1923, and by examining inflation variables, money supply and money demand, they finally concluded that there is no price bubble. Larsen (1997) has investigated price bubbles in Norway Stock Exchange and its effect on the country’s economy from 1982 to 1997. He has rejected the efficient null hypothesis *EMH* during the study period, which is the hypothesis referring to the absence of price bubbles, using two methods of West’s detection test (1987) and Shiller’s variance test (1981). Chang and Tay (1998) studied the causal relationship between macroeconomic variables and total stock price index in Korea using the monthly data for the period (1992-1998). In this research, using Engel-Granger co integration methodology, the long-term relationship between total stock price index as the dependent variable and variables of exchange rate, production index, trade balance and money volume as the independent variables has been investigated. The results of the research indicate the positive relationship between total stock index and production index and trade balance and its negative relationship with exchange rate and money volume. They concluded that total stock index in Korea is not a leading index for macroeconomic variables. Siegfried’s study (2000) shows that implementation of monetary policy, through changes in interest rate,

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has no significant effect on investment. In addition, the credit channel in periods, during which contractionary monetary policy is applied, is more important than interest rate. Christophe (2003), using Blanchard Watson test (1992) in the short term, confirmed the existence of rational inflationary bubbles in the U.S. stock market from 1871 to 2001 and in France from 1951 to 2002, but using MTAR model in the long term, he has rejected the existence of rational inflationary bubbles for the United States and France in the aforementioned period. Zubeydi and Azali (2001) have presented an article entitled “Stock Market and Economic Activities” in which the effect of five variables of money volume, nominal income, price level, interest rate and exchange rate on stock price index in Malaysia Stock Exchange has been investigated. The results of this research indicate that interest rate and money volume lead the stock price and are considered as its Granger causality, but regarding the price levels, nominal income and exchange rate, the causal relationship is from stock price towards the three above-mentioned variables. Thus, they conclude that stock market boom, nowadays, represents a high nominal income in the future. Ramachandran (2004) studied the relationship between money volume, production and prices for the period 1951-2001 for India and proved the existence of a stable relationship between the variables of the model in the mentioned period. Ramachandran concluded that changes in money volume causes changes in prices in the short term. Therefore, in the short term, the policies should be adopted with caution so that it will not cause severe volatility in prices in the long term. Hussam *et al.*, (2008) showed that if the parameters are variable, the experienced people also create bubbles. Kirchler *et al.*, (2012) showed that the main factor of bubbles in the market is that individuals are wrong about the base value reduction. Azizi (1999) in a study entitled “identification of macroeconomic variables affecting stock price index” for the period (1990-1997), came to the conclusion that changes in macroeconomic variables in Iran cannot explain changes in stock price index. Kiyani and Shamsi (2000) in an article under the title of “rational bubbles in Tehran Stock Exchange”, used the arbitrage relationship, which is one of the fundamental relationships in asset pricing, and have introduced bubble price and bubble component. In this article, using econometric methods, the information needed to test the presence or absence of bubble has been produced on a monthly basis. After this step, using two methods of testing the stability of the ratio of price to earnings per share, the bubbles in the stock price of 17 companies have been investigated. The results of the two tests (tests of stability and convergence) to detect bubbles in the prices of these companies are not consistent with each other, and the stock prices of some companies, which had been identified as having bubbles in the first test, have been identified as not having bubbles in the second test. The tests were conducted over the period 1991 to 1997. Mehrabian (2001) in a study entitled “the sensitivity of stock market to monetary and financial volatility”, tried to identify the effect of shocks resulted from macroeconomic variables on the stock market and investigated the effect of shocks on the stock market using VAR model. The results indicate that in the short term, the monetary variable has had the most effect on stock price index, but in the long term, first the gross domestic product and then inflation has the most significant role in justifying stock price index. Samiromi (2005) has investigated the existence of rational inflationary bubbles over the years 1961-2004. In this research, two exogenous hypotheses of lack of money supply with respect to inflation by Granger causality test and the hypothesis of absence of rational inflationary bubbles by West method (1987) have been investigated. Based on the findings, the money supply has been exogenous compared with inflation, and during the study period, rational inflationary bubbles have existed. Godari (2006), in a study entitled “the investigation of price bubble in Tehran Stock Exchange in recent years (2004-2005)”, has defined bubble as the sharp and continuous rise in the price of assets or set of assets. The initial rise in prices is due to expectations of rising prices resulted from attracting new buyers. This rise in prices is often associated with negative expectations and severe decline in prices which has led to financial crises. In this research, the nature of bubble has been investigated from the perspective of psychology, general system theory and financial economics, and through using the stability test of price with respect to earning and also using unit root test, the existence of bubble in the market in 2004 has been proved. This thesis has investigated bubble in stock prices of 23 active companies in the stock exchange. Zadeh (2007), in a study under the title of “the investigation of causal relationship between stock price index and economic growth in Iran”, has studied

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Granger causality between price indices of stock exchange and the index of economic growth in Iran for the period 1992-2004, and after estimating research models using Eviews software and Granger causality method, has come to the conclusion that there is a two-way causal relationship between total stock index and index of economic growth, so the total stock index is a leading index as compared to the index of economic growth. Also, there is a two-way causal relationship between price index and Tehran Stock Exchange return and the total index, so that price index, as compared to total index, is a leading index. Ultimately, there is no causal relationship between two variables of industry index of Tehran Stock Exchange and total index, and the two variables are independent. Poor (2007) has studied and analyzed the existence of rational price bubbles in Tehran Stock Exchange for the period 2000/3 to 2007/3. In order to do this, 3 different tests has been used in this research. They include: unit root test, co-integration test and collective deficit test. Using unit root test and co-integration test, the existence of bubble in Tehran Stock Exchange has been confirmed. However, the results of the collective deficit test indicate that data has the properties of being back to the mean. Thus, the existence of bubble in Tehran Stock Exchange is rejected. Toriki (2008) in a study entitled “bubbles of prices and capital market in Iran”, using RALS technique and the application of Monte Carlo simulation method, has investigated the presence or absence of price bubbles in the stock market in Iran and shows that the stock price has deviated from the long-term equilibrium path (the present value of expected future profits). Hence, the existence of bubble in the capital market of Iran is proved.

## **MATERIALS AND METHODS**

In the present research, data collection tools include databases, archives of the stock exchange, archives of the central bank and also publications of stock exchange and central bank.

The final analysis of the data has been carried out with the help of Excel 2010 and Eviews6 software. Dickey Fuller test has been used for testing the stationary status of variables. ARCH method for studying heteroscedasticity, (F-Static) model for the significance of overall model and LM and JB tests respectively have been used for determining autocorrelation and normality between independent variables of the research. Then, using OLS test, the model has been estimated and the hypotheses have been tested.

### ***The Independent Variables of The Research Include:***

1. Money volume (MON): money volume includes all the cash encompassing notes and coins and visual and non-visual deposits in commercial banks (Abbaslou, 2010).
2. Quasi money (MSI): the asset which can be used like money as the criterion of accumulation of value, but it cannot be used as the facilitation factor of exchange such as documents and bonds and different types of saving accounts. These assets are readily convertible to cash. However, the distinction between which assets form money is a subject which has caused disagreement among economists. Thus, there many differences in economists’ opinions over the definition of money supply (ibid.).
3. Five-year and long-term bank deposit interest rate (ROD): rate of interest on account of deposits in state banks is based on percentage. In the present research, the one-year short-term and five-year long-term investment interest rate has been used.
4. Sales volume of bonds (TSB): the securities sold are those which have been issued by companies and governmental and non-governmental institutions and are in the hands of investors. Bonds are issued for two purposes:
  - 1- Financing the companies and governmental and non-governmental institutions. It can be said that this is only a kind of cash transfer, and if not used properly, it can increase the risk of inflation in the future.
  - 2- For contractionary monetary policies which are offered to the market merely because of controlling liquidity.Bonds in the past few years has often been issued for attracting resources, funding government development projects and, in some cases, for semiprivate projects.
5. Consumer price index (CPI): consumer price index or index of commodity price and consumer services is one of the important price indices for measuring inflation rate and the purchasing power of domestic currency of each country. This index is used for designing welfare programs and social security,

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adjusting wages and drawing up bilateral contracts. In order to choose goods and services, which are the basis of calculation, first the coefficients of goods and services are calculated using household budget survey results. Then, considering their weight and pricing capability, they are placed in fiscal ped.

#### The Dependent Variables of the Research are:

1. Stock market bubble (BUB): In the economics literature, deviation of the commodity price from its long-term equilibrium price is called bubble. In fact, when the commodity or service price is different with its expected price in the future, the subject of bubble is discussed (Barzandeh, 1998).

In stock market, the difference between the current value of stock price and intrinsic value of stock price is called bubble which is calculated according to the following equation:

$$BUB_t = P_t - F_t$$

$BUB_t$  = Stock price bubble

$P_t$  = Current value of stock price at time (t)

$F_t$  = Intrinsic value of stock price at time (t)

$$P_t = (1 + r)^{-1} E_t(P_{t+1} + \alpha d_{t+1} + u_{t+1})$$

$$F_t = \sum_{j=1}^{\infty} (1 + r)^{-j} E_t(\alpha d_{t+j} + u_{t+j})$$

r = is a real stable interest rate for discounting expected capital incomes.

$E_t$  = is the Conditional Expectation Operator for the information at time (t).

$\alpha$  = is a positive stable value which measures the expected dividend divided by expected capital incomes.

$d_{t+1}$  = is the real dividend before the payable taxes to the stockholder between dates (t) and (t+1).

$d_{t+j}$  = is the real dividend before the payable taxes to the stockholder between dates (t) and (t+j).

$u_{t+1}$  = is the variable which is observed or created by the market factors but not observed by the researcher.

#### Statistical Community and Sample of the Research

In the present research, the statistical community includes all the listed companies in a stock exchange whose trading halt is not more than four months. With this assumption, the number of companies of the statistical sample of this research is 60 companies which are among the listed companies in the stock exchange. And the quarterly data of the companies for the years 2001 to 2008 has been used in this research.

#### Hypotheses

The present research includes one main hypothesis and five minor hypotheses which are as the following:

##### The Main Hypothesis:

Monetary policies have effect on Iran's stock market bubbles.

##### The Minor Hypotheses:

1. Money volume has effect on Iran's stock market bubbles.
2. Quasi money has effect on Iran's stock market bubbles.
3. Five-year long-term bank deposit interest rate has effect on Iran's stock market bubbles.
4. Sales volume of bonds has effect on Iran's stock market bubbles.
5. Consumer price index has effect on Iran's stock market bubbles.

#### Research Model

In the present research, in order to estimate the final model of the research, OLS test has been used, and the overall model is as follows:

$$BUB_t = f(MON_t, MSI_t, DROD_t, TSB_t, CPI_t)$$

After calculating bubble, the descriptive statistics of the research, providing an overview of the status of research data, are presented in Table 1.



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**Table 1: Descriptive Stats**

Variable	Number	Minimum	Maximum	Mean	Std. Dev
BUB	32	-1988.92	5766.32	392.9869	1706.626
MON	32	1.15×108	5.36×108	2.86×108	1.33×108
MSI	32	1.48×108	1.38×108	5.75×108	3.79×108
DROD	32	-0.06	0	-0.001875	0.010607
TSB	32	0	38830134	7714661	8826364
CPI	32	172.3	374.9	287.9250	73.08880

**Data Analysis and Research Hypotheses Test**

**a-** The first step in data analysis is studying the stationary status and testing unit root of the variables. The results of unit root test are presented in Table 2.

**Table2: Unit root test**

Variable	Test critical values	Augmented Dickey-Fuller test Statistic	Results
BUB	1.952	3.72	BUB has a unit root in Exogenous: None
MON	3.587	6.009	MON has a unit root in Exogenous: Constant, Linear Trend
MSI	1.955	5.045	MSI has a unit root in Exogenous: None
DROD	3.568	5.409	D(ROD) has a unit root in Exogenous: Constant, Linear Trend
TSB	1.952	3.569	TSB has a unit root in Exogenous: None
CPI	1.952	2.053	CPI has a unit root in Exogenous: None

**b- Hypotheses Test Results and Model Estimation**

Results of tests related to the hypotheses, in which classic assumptions tests has been used, are presented in Table 3.

**Table 3**

	All the variables			Remove intercept			removing irrelevant variables with smaller that 1		
	Prob	Coefficient	t-static	Prob	Coefficient	t-static	Prob	Coefficient	t-static
MON	0.005	4.78×10-5	3.041	0.006	4.59×10-5	3.004	0.003	4.61×10-5	3.26
MSI	0.026	-1.16×10-5	-2.36	0.025	-9.97×10-5	-2.38	0.015	-1.01×10-5	-2.6
DROD	0.507	-171391.9	-0.67	0.414	-20763.02	-0.83	-	-	-
TSB	0.803	8.48×10-6	0.253	0.681	1.35 × 10-5	0.416	-	-	-
CPI	0.13	-18.6636	-1.56	0.002	-24.7705	-3.38	0.002	-24.193	-3.5
C	0.52	-1327.92	-0.65	-	-	-	-	-	-
R2		0.39			0.38			0.36	
R.Adj		0.276			0.291			0.322	
F-statis		3.368			3.045			5.774	
Pro(F)		0.017			0.28			0.003	
D.W		2.5			2.5			2.38	
LM		0.1368			0.1304			0.2391	
ARCH		0.7887			0.6469			0.7826	
J-B		0.008			0.05			0.01	

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### OLS Regression Test Results

Considering the hypotheses tests table of the present research, the coefficient of determination ( $R^2$ ) in the first case showed that the independent variables explain 39% of changes in dependent variable. Due to the low  $R^2$  value, the model was tested after eliminating the constant of intercept. In this case, its value was equal to 38%. Then, after eliminating irrelevant variables with t-Statistics smaller than one, the model was tested with classic assumptions test. And in this case, the final model of the research was estimated, and in the final model,  $R^2$  value was equal to 36% which indicates that 36% of dependent variable is covered by the variables of money volume, quasi money and consumer price index.

The (F-statistic) value, in cases where there are intercept and irrelevant variables, is equal to 3.368 and the Prob value related to it is equal to 0.017 which indicates the significance of the overall model. Also, (F-statistic) value, in the final model of the research, equals 5.774 and its Prob value equals 0.003 which indicates the significance of the final model of the research.

Durbin-Watson statistic of the research in the first case where the model was tested with intercept and in the case of eliminating the constant of intercept, equaled 2.5. But after eliminating irrelevant variables of the research, it was equal to 2.38 in the final model of the research. And since it is between 1.5 and 2.5, so there is no correlation between the components of the model.

In order to examine autocorrelation between the independent variables, some hypotheses are formulated as follows:

$H_0$ : There is no autocorrelation between variables.

$H_1$ : There is an autocorrelation between variables.

In order to test the above hypotheses, the LM autocorrelation test has been used in this research. And based on the mentioned results of this test in Table 3, there is no autocorrelation between independent variables of the research.

### The Results of Heteroscedasticity Test

In order to investigate the presence or absence of Heteroscedasticity Test in the model, the following hypotheses have been formulated:

$H_0$ : There is no Heteroscedasticity Test.

$H_1$ : There is Heteroscedasticity Test.

To investigate these hypotheses, ARCH method has been used in this research, and based on its results presented in Table 3, the  $H_0$  hypothesis is confirmed, i.e. there is no Heteroscedasticity Test in the model.

### Results of Testing the Normality of the Model

To check the normality of the model, some hypotheses are formulated as follows:

$H_0$ : Model distribution is not normal.

$H_1$ : Model distribution is normal.

In order to investigate these hypotheses, J-B (Jarque-Bera) test has been used. The results, confirming  $H_1$  hypothesis, were stated in Table 3. And the model, when there was constant of intercept and when intercept and irrelevant variables were eliminated and in the final model, was normal.

## RESULTS AND DISCUSSION

The results of research on hypotheses at 95% confidence level were as follows: **The First Minor Hypothesis** at this level, the variable of money volume is significant and has a positive effect on stock market bubble, i.e. this hypothesis is confirmed so that one unit increase in money volume will cause  $(4.59 \times 10^{-5})$  unit increase in Iran's stock market bubble. **The Second Minor Hypothesis** Quasi money, at this level, has a significant and negative effect on stock market bubble so that one unit increase in quasi money will lead to  $(-1.01 \times 10^{-5})$  decrease in Iran's stock market bubble. Thus, this minor hypothesis of the research was also scientifically confirmed. **The Third Minor Hypothesis** at this confidence level, the five-year long-term bank deposit interest rate is insignificant, and this variable was eliminated from the model. This hypothesis was not scientifically confirmed. **The Fourth Minor Hypothesis**: at this confidence level, sales volume of bonds is insignificant and does not affect the stock market bubble. Therefore, this hypothesis was rejected and the variable was eliminated from the model. **The Fifth Minor Hypothesis**,

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Consumer price index, at this confidence level, is significant and has a negative effect on stock market bubble so that one unit increase in consumer price index will cause (-24.19) unit decrease in Iran's stock market bubble. In the present research, after classic assumptions test and model estimation, the results indicate that money volume had a positive effect on Iran's stock market bubble, and quasi money and consumer price index had a negative effect on it. And five-year long-term bank deposit interest rate and sales volume of bonds had not effects on stock market bubble. Considering the fact that variables of money volume and quasi money of monetary policies had effects on stock market bubble, and since this market is a new one and the majority of people are not familiar with stock market as the important source of capital turnover in the economy of any country, it is suggested that policy makers pay special attention to this market in the application of macroeconomic planning so that people's capital is led to this market. Thus, we will see the demand for corporate stock, arrangements for the increase in company production and ultimately increase in economic growth. Also, due to significant effect of consumer price index on stock market bubble, the officials of the stock exchange can prevent the price level and inflation from increasing, in collaboration with the central bank and money and credit council, with the adoption of necessary policies and advertisements and with transfer of surplus funds to the market. Moreover, they can enhance growth and prosperity of the stock exchange with the adoption of these policies.

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