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The Impact of Money Supply on Stock Returns: Evidence from Tehran Stock Exchange

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ABSTRACT

Monetary policies refer to the set of measures and decisions that are taken through the central bank to control the supply of money and credit, so that changes in the supply of money affect the flow of society's expenses. As observed in recent years, the successful performance of the stock market can have a significant effect on the economic growth of countries, and on the other hand, the increase in the amount of money affects economic activities. This research examines the effect of the money supply volume on the stock returns of 247 listed companies on the Tehran Stock Exchange (TSE). In the present research, the relationships between the two variables are examined on a monthly basis during 2002-2007. Probit models in Stata software wete used to investigate the relationship between the stock returns and the money supply volume. The results do not show a significant relationship between the money volume and stock returns.

KEYWORDS: Money volume; stock returns; Tehran Stock Exchange (TSE)

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1. INTRODUCTION

For economic growth and development, investment is a key factor. Almost all economists emphasize the formation and accumulation of capital as one of the main drivers of economic growth and development. In this regard, investment companies and financial institutions that play a major role in the financial markets have a special position. One of the important functions of these companies is to direct the continuous and relatively low-cost flow of financial resources from savers to final users or investors. In this way, the individual investor, while benefiting from complete diversity of the asset portfolio, receives cash dividend and capital gains at the lowest risk. Considering the magnitude of investment of these firms in securities, their risk and return depend on a variety of factors including monetary policy (Rahnama et al, 2014).

Monetary policies are part of the country's overall economic policies within a framework coordinated with other economic policies, by which the authorities try to control the money supply in a way that suits the country's goals. The monetary authorities using monetary policy tools can control the cash flows and influence economic growth and development by properly directing the investment towards productive sectors (Ghaffaripour, 2004). Therefore, monetary policy is a set of measures and decisions taken by the central bank to control the money supply and credit and influence the flow of spendings through changes in the volume of money in circulation and thereby help achieve the overall economic goals. Since investors seek to make profit and eventually maximize their wealth, they invest in assets with higher returns and lower risks. Basically, stock yield refers to the amount of income obtained from the investment in stocks or other types of investment (Alefian, 1999), which is influenced, among others, by monetary policies that affect stock returns.

2. Theoretical framework

Stock return is the ratio of the total profit or loss from investment in a given period to the amount of capital that was invested to generate this profit (income) at the beginning of the same period. This income includes the change in the price of the principal capital and the profit belonging to this capital (Ghanbarpour, 2007). Banknotes and coins outside of depository institutions in addition to the reserves deposited by these institutions are called the monetary base. In other words, the monetary base is the collection of funds outside banks and reserves kept by the banking system (the money kept at banks and banks' deposits with the central bank). Money is the collection of banknotes and demand deposits. In the broader definition, term deposits and securities of the stock market, which are called pseudo-money, are part of money. Circulating money consists of banknotes and coins in the hands of people in a country, i.e. the sum of all the banknotes and coins issued minus the banknotes and coins kept with the banking system. The money volume is the amount of banknotes and coins in the hands of people, plus demand deposits of the private sector with banks. Demand deposits are considered as part of the money volume as they can be received upon the demand of the account owner or exchanged for checks (Farahani Fard, 1999).

Monetary policy, as a type of economic policy, is the use of certain monetary tools to achieve specific goals, and more precisely, monetary policies refer to the set of measures and decisions made by the central bank to control the amount of money and credit. It is employed to influence the society's spendings through changes in the money supply, and thereby, to facilitate the achievement of the set economic goals. Expansionary monetary policy is an increase in the real volume of money supply in circulation aiming to increase the general demand (purchase and spending). This policy consistently seeks to provide greater access to credit at reduced interest rates. Contractionary monetary policy, on the other

hand, limits the amount of money in circulation, seeking to reduce public demand (purchase and spending), while limiting credits and raising bank interest rates and re-discount rates.

Jones and Noel (1987) investigated the relationship between stock returns and money supply from May 1974 to December 1983 in U.S. using the Granger causality test. Their test results supported the notion that the stock market is efficient in the sense that current and past information with regard to the money supply is fully reflected in current security prices. Hence, investors are not able to develop profitable trading rules with information on changes in the money supply.

Asprem (1989) investigated the relationship between stock prices, asset portfolios and macroeconomic variables in ten European countries, Germany, England, Italy, Switzerland, France, Sweden, Finland, Netherlands, Norway and Denmark. The results of the estimate showed a negative correlation between interest rates of long-term bonds and stock prices in all these countries, and a positive relationship between money supply and stock prices.

Chang Keon, Tai Shine and Frank Bakoun (1997) investigated the relationship between market stock returns and macroeconomic variables in less developed countries. Three regression models were used to test the relationship between stock returns and macroeconomic variables.

3. Research method

In this research, the information published by the Tehran Stock Exchange (TSE) and the statistics and various publications of the Central Bank on the money supply and liquidity were used. The statistical sample consisted of 247 TSE-listed companies with actively traded stocks on the stock exchange during the 6-year period of 2002-2007. To examine the effect of money volume on stock returns and estimate the regression models, the econometric method probit model in Stata software was used.

To convert qualitative variables into quantitative ones, as required in regression analysis, dummy variables are used to which the values of 0 and 1 are assigned, depending on whether an attribute or quality is present or not (i.e. 0 when absent and 1 when present). These variables are also called virtual variables. One of the methods that uses such variables is the probit model. The probit model is a type of econometric model with qualitative dependent variables. The probit model was proposed by Chester Ittner Bliss in 1934 in an article published in Science. The probit model is as follows:

$$Ii = \beta 0+\beta 1Xi+Ut \qquad (1)$$

In this study, money volume is the independent variable and stock returns the dependent variable. Stock returns are influenced by a variety of factors including:

1. A rise in stock price, itself being a function of different factors such as quantitative and qualitative changes, new investment, and inflation, etc.
2. Paid cash dividend; a company that pays a lower cash dividend spends its funds on new investments with an increase in liquidity, which ultimately results in appreciation of the company's share price (Ghasemi Tazehabadi, 2007).

Thus, the yield of a stock held for one year is equal to the sum of the yield from the received dividends and the yield from capital gain or loss, which can be expressed as follows:

$$Rit = \frac{Pit - Pit-1}{Pit-1} + \frac{Dit}{Pit-1} \qquad (2)$$

Where Rit is the rate of stock return of company i at time t, Pit the share price of company i in the first period, Pit is the share price of company i at the end of period t, Dit is the ownership interest resulting from the dividend, Pit-Pit-1/Pit-1 is the return from capital gain or loss, and Dit/Pit-1 is the return obtained from dividends.

Money supply: consists of bills and cash in the hands of people, as well as the demand deposits of the private sector with banks.

Research hypothesis and model

Hypothesis. An increase in the money supply increases the probability of the stock return increase on Tehran Stock Exchange.

To examine the relationship between money supply and stock returns, the probit model was used as follows:

(3) $des= \beta 0+ \beta 1\ m1 +ut$

(4) $pestr= \beta 0+ \beta 1T1\ m1+ ut$

In equation (3), des is the stock returns considered as the dependent variable. In addition, β0 and β1 are the coefficients of the independent variable that express the causal relationship between the independent (money supply) and dependent (stock returns) variables, depending on the sign, and m1 the money supply as the independent variable whose likely impact on return is to be examined. And ut in the above equation is the error term.

In equation (4), pestr is the stock return as the dependent variable and m1t1 is the money supply with a time interval as the independent variable.

4. Findings

In the research hypothesis, we investigated the relationship between money supply and stock returns. This means that if the money supply changes by one unit, what is the probability for a change in stock returns? Since here we seek to measure the probability of the relationship significance, the probit model is used.

Table 1. The relationship between money supply and stock returns based on probit

Des	Coef	. Std. Err.	Z	P>|z|	[95% Conf.	Interval]
m1	-.0000119	.0000108	-1.11	0.268	-.0000331	9.19e-06
_cons	.087381	.1630254	0.54	0.592	-.2321429	.406905

In table 1, the relationship between money supply and stock returns is tested monthly for a period of 6 years. In the above table, m1 is money supply and. Coef. its coefficient. The negative sign of Coef. indicates an inverse relationship between money supply and stock returns. Since 0.268 is greater than 0.10 at the 90% confidence level, there is no statistically significant relationship between the above two variables.

In order to verify the hypothesis test, a regression model is used. The results of the model estimation are presented in table 2.

Table 2. The relationship between money supply and stock returns based on OLS

ES	Coef.	Std. Err.	T	P>|t|	[95% Conf.	Interval]
M1	**-.0000229**	**.0000223**	**-1.03**	**0.307**	**-.0000673**	**.0000215**
-cons	**1.834364**	**.3408776**	**5.38**	**0.000**	**1.154332**	**2.514396**

In the above model, at 90 percent confidence, there is no statistically significant relationship between the two variables, i.e. money supply as the independent variable and stock returns as the dependent variable (since 0.30 is greater than the error threshold of 0.10).

In this model, a negative Coef signifies a negative relationship between the two variables. That is, an increase in the independent variable will result in a decrease in the dependent variable. However, given the contents of the above table, the relationship is not statistically significant.

Considering that the money volume variable does not have a statistically significant effect on stock returns at the confidence level of 0.90, we re-test the above model with a one-period interval.

Table 3. The relationship between money supply and stock returns with an interval based on probit

Pestr	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
m1t1	-2.70e-07	1.52e-06	-0.18	0.859	-3.26e-0	2.72e-0
_cons	.0889148	.4291817	0.21	0.836	-.7522658	.9300955

In the above table, m1t1 represents money supply with a time interval equal to m(t - 1). In this model, too, the relationship is not statistically significant at 90 percent confidence interval, the error (0.859) being greater than 0.10.

Table 4 examines the marginal effect of the change in money supply on stock returns. The marginal effect is used when the relationship between the variables is significant to make sure of the significance. But here, the marginal effect is examined to make sure of the initial results.

Table 4. The marginal effect of the change of money supply on stock returns

variable	dy/dx	Std. Err.	z	P>|z|	[95% C.I.]		X
m1t1	-1.08e-07	.00000	-0.18	0.859	-1.3e-06	1.1e-06	264106

Since at the 90% confidence level, 0.85 is more than 10%, the dy/dx coefficient is not significant, so, neither the marginal effect indicates a significant relationship between the two variables. In case the relationship between the two variables was significant at the above level, it would be stated that with an expansionary monetary policy, by creating a time interval, for one unit change in money supply, the stock return will fall by 1.08.

Therefore, given the test results, the first hypothesis is rejected. That is, there is no significant relationship between money supply and stock returns.

5. Conclusion

Since the ultimate purpose of an economy based on free choice is to maximize consumer welfare, and since the growth and prosperity of a society's economy depends on reliable investment and correct planning, the creation of large companies for production requires that the society's liquidity as much as possible be collected and directed towards production, increasing per capita income, economic growth and public welfare. The stock exchange plays an essential role as a lever to attain this goal by concentrating the capital and making it available to productive activities, as well as attracting people's participation in productive investments. The government, as the main national power, can also play a decisive role by adopting various decisions, laws and solutions within the framework of monetary policy to control liquidity fluctuations in the country.

Monetary policy refers to the set of measures and decisions taken by the central bank to control money supply and credit, and thereby, to influence the flow of the public spendings through changes in the money supply, which as a result, helps achieve the greater economic goals. By introducing law or other regulations, tools are provided to the central bank to control the money supply. The main and most common monetary policy tools are called qualitative and quantitative monetary policy tools. The quantitative tools include statutory discount rate, rediscount rate and open market operations. And qualitative tools are a set of tools at the disposal of the central bank that employs them to influence the way money is spent in the economy. Therefore, the control of fluctuations in the money supply by the government and its subset institution (the central bank), using such tools as monetary policy, capital market and manufacturing companies can play a critical role, which may have a positive or negative effect on the stock returns of companies and ultimately result in a greater or lesser degree of public participation in the capital market. Therefore, considering the significance of the topic, researchers investigated the effect of money supply changes on stock returns in different time periods and different countries.

In this study, the probability of the increase in the stock returns due to the increase in money supply was examined using the probit model, the result of which did not support our hypothesis. Hence, it was concluded that no significant relationship exists between the two variables. Further, to verify the result with more certainty, this hypothesis was also tested with the OLS model, and this time, too, the former results were obtained, leading to the rejection of the research hypothesis. Subsequently, the test was performed by introducing a time gap (interval) in the money supply. This time, the situation even worsened and no significant relationship was deduced. Having thus made sure of the initial result, it was inferred that, during the understudy period (2002-2007), money supply had no significant effect on the stock returns of the listed companies on the TSE.

This finding is consistent with the results documented by some of the foreign researchers including Jones and Noel (1987), Karamostafa and Kucukkale (2003), Man, Atra, and Dowen (2004), and Hartmann, Kempa, and Pierdzioch (2008) who neither found a significant relationship between money supply and stock returns.

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Authenticity of the texts, honesty and fidelity has been observed.

CONFLICT OF INTEREST

Author/s confirmed no conflict of interest.