

The effect of systematic volatility and unsystematic on the stock liquidity using AMIVEST criterion (Companies listed on Tehran Stock Exchange)

Parinaz Samsam Zadeh

Department of Financial Management, Boroujerd Branch, Islamic Azad University, Boroujerd, Iran

Abdolkarim Moghadam*

Assistant Professor, Department of Accounting, Payame Noor University, Tehran, Iran

*Corresponding Author: karymog@yahoo.com

Abstract

Liquidity is one of the concerns of those who attempted to take stock or manage the equity infrastructure. One indicator of the stock market situation, the liquidity of the securities included in it. Two factors effect on the liquidity included systematic volatility and unsystematic volatility. The probability of real output than what is expected, define on stock returns liquidity, stock returns liquidity including systematic volatility and unsystematic, increased systematic volatility increasing stock liquidity and increased unsystematic volatility will reduce the liquidity of the stock. On the basis of this study, the effect of systematic volatility and unsystematic on the liquidity is evaluated using Amivest criterion. This research in terms of purpose applied and type descriptive - correlational study, based on three hypotheses were tested. For this purpose, a sample of 95 companies among all companies listed in Tehran Stock Exchange, the time return 2009 to 2013 by systematic elimination method according to the results achieved, stock returns volatility effect on stock liquidity so that systematic volatility of stock returns leading to increased stock liquidity and increased stock returns unsystematic volatility leading to reduces the stock's liquidity.

Keywords: stock liquidity, stock systematic volatility, stock unsystematic volatility, volatility, AMIVEST liquidity ratio.

1. Introduction

Liquidity is one of the concerns of those who attempted to take stock or manage the equation infrastructure. One indicator of the stock market situation, the liquidity of the securities included in it. Liquidity is an important criterion in the market. In the liquid market prices move slowly and the distance between the proposed purchase price and selling close to zero. (Tehrani, et al., 2011: 13)

Whatever stock liquidity is greater in the market which means cost of capital for companies was lower and factor for determining the market price and the value perceived by investors, whatever the degree of liquidity of the company stock is higher stock, equally demand for stock increases.

Various factors may effect on the liquidity but the most important effecting factors on the stock liquidity including the labor market, disclosed information, decimal, the minimum allowed changes, and the automatic exchange (Anvari Rostami and Larry, Semnan, 2007)

One of the effecting factors on the liquidity is the volatility of stock returns. Volatility of stock returns is one of the most financial controversial issues, in recent years attractive by capital market researchers (Jones, 2010) increasing the systematically volatility which provide a greater ratio of market data is increasing stock liquidity and increasing the unsystematic volatility with reflecting more specific information of company will reduce the liquidity of the stock. According to the expression; this study try to the answers the question: Is the volatility of stock returns by systematic and unsystematic volatility effect on the stock liquidity?

2. History

John and colleagues (2002) by using the criteria of circulation ratio, the value of transactions, turnover ratio to variability as a measure of market liquidity, liquidity behavior in the emerging markets examined and found that stock returns in emerging countries positively associated with market liquidity.

The Chen research results (2005) showed that liquidity is a major risk factor pricing. Celli Steele and colleagues (2013) in their study concluded that the lack of liquidity, friction, and the company size and correlation between the stocks before the shock with the change of Synchronization move of stock related.

Their AN & Zhang research results (2012) show that there is a positive relationship between professional institutional investors and stock prices synchronization and between temporary institutional investors and the stock price synchronicity.

The Tripathy research results (2011) indicate that there is a bidirectional relationship between transaction volume and volatility of stock returns.

The research results of Ahmadpur and Peykar negar Ghaleh roudkhani (2011) showed that a significant an inverse relationship between earnings quality and price synchronization which means the accruals estimation error is high (Quality of accruals will heal), the price synchronicity also will be high.

Mashayekh and Harraf Amou fin (2011) in a study titled "The relationship between company size and volatility of stock returns in different market conditions" found between the size and volatility of stocks', when market conditions are not taken into account, there was a

significant and positive and weak correlation and when the market conditions are considered, there is a direct and significant and positive relationship.

Hypothesis

- Systematic volatility of stock returns effect on stock liquidity.
- Unsystematic volatility of stock returns effect on stock liquidity.

3. Conceptual and operational definition of variables

Variables used in this study consisted of three variables, the dependent variable, independent variable and control variables are presented in Table 1

Table 1: the summary of studied variables

Type of variable	Variable name	Source	Symbol
Dependent variable	Stock liquidity	AMIVEST (2002)	Liquidity
Independent variable	Systematic volatility of stock returns	Chan et al. (2013) Drew (2004)	SysVol
	Unsystematic volatility of stock returns	Chan et al. (2013) Drew (2004)	Idol
Control variable	size of the company	Chan et al. (2013) (2004)	Size
	Institutional ownership	Accounting Standard No. 20 Iran	IS
	Stock turnover	Chan et al. (2013)	Turnover

The dependent variable

Stock liquidity: the dependent variable is a variable that the researcher aim explained or predicted variability in its (Khaki, 2008). Stock liquidity is the dependent variable. To calculate the stock liquidity different criteria including transactions, difference offer purchase price and sale used. Liquidity criteria of this study is the Amivest ratio. Amivest liquidity ratio: this creation transactions value of a stock for the price change created in the period of time calculate the price change, as this ratio is greater reflects the effect of lower prices and greater liquidity (Moradzadeh Far and Abu Hamza, 2011). This measure is calculated for transactions days with non-zero return, the transactions value split on the absolute of return relation achieved as follows:

$$liquidity = \frac{1}{Days_t} \sum_{d=1}^{days} \frac{|R_{td}^i|}{V_{td}^i}$$

The independent variables

Systematic volatility of stock returns: Another research independent variables is the systematic volatility of stock returns. Stock returns can vary in different courses and with no steady trend. So volatility and the variability inherent in stock returns over time (Mashayekh and Harraf Amou fin, 2011). Systemic volatility equal to systematic variance root of stock that can be obtained from the following equation:

Unsystematic volatility of stock returns: unsystematic volatility of stock returns as independent variables checked that for the calculation of unsystematic volatility of stock returns, the method of Drew et al (2004) and Chan et al (2013) have been used. Unsystematic volatility of stock returns equivalent the square root of the difference between the total volatility and systematic volatility. The total volatility equal to the stock returns variance is obtained from the following equation:

$$\delta_{i,t}^2 = \frac{1}{N-1} \sum_{j=1}^N (R_{i,j} - \bar{R}_{i,t})^2$$

N = observations number of stock returns i

j = R_{i,j} th stock returns i

R_{i,j} = returns mean of stock i in the fiscal year that are obtained from the following equation:

$$\bar{R}_{i,t} = \frac{1}{N} \sum_{j=1}^N R_{i,j}$$

Unsystematic volatility obtained from the following equation:

$$IdioVol_{i,t} = \sqrt{\delta_i^2 - (\beta_i^2 \delta_m^2)}$$

Control variables

Company size: the company size is the measure to determine how large or small companies are used. In the present study, the company size is the research control variables and through the natural logarithm of the market value obtained shareholders' equity

Institutional ownership: In this study, the percentage of institutional ownership as a control variable to be checked. According to Accounting Standard No. 20 Iran, shareholders at least 20% stock, have the right to vote, are considered as institutional shareholders. After identifying institutional investors, to calculate the percentage of institutional ownership in each company, the stock number of institutional ownership on the total number of common stock published by the company at the beginning of the period split.

Stock turnover: Stock turnover as a control variable in the present study. Which is calculated as follows:

TO = The number of ordinary stock traded / weighted average of number of stock during the year

4. Methodology

Since historical data is used to test the hypothesis, the research in the field of empirical research (proof) is located and in terms of purpose applied and its nature the cross-

correlation. Research spatial domain the company is listed on the Tehran Stock Exchange the period of investigation between the years 2009 to 2013. Research subject domain in the field of behavioral - finance studies and as the effect of systematic volatility and unsystematic on the stock liquidity by using liquidity AMIVEST. The statistics population of the investigation the companies listed on the Stock Exchange in Tehran. According to the study subject, data collection method is mining documents. Information related to research variables, the financial statements and accompanying notes and by Tadbir pardaz and Rah avar novin application were extracted.

In addition to the other required information, CD Exchange and the official website of Tehran Stock Exchange is used. The analysis by Excel, Eviews software done.

In this study, quantitative methods of statistical analysis were used which is the multivariable regression analysis. For this purpose test F, and Student's t and determination coefficient analysis (R^2) is used. To determine the type of combined data from F-Limer test and Hausman used. All of this statistical analysis to help Eviews software and Excel will be carried out. In addition, this research is at 95% confidence.

5. Findings

A) The descriptive findings

The data descriptive statistics of the study, in a table summary and calculated.

Table 2: Descriptive statistics variables

Variable Parameter	IDIO unsystematic volatility	ILL liquidity	IO Institutional ownership	SIZE Company size	SYSVOL systematic volatility	TO Stock turnover
Mean	0.07	7.36	60.78	13:47	6.62	251451
Median	0.06	0.54	65.75	13.66	6.29	99313
Maximum	0.67	908.67	98.50	21:54	19:20	4337454
Minimum	0.00	0.08	0.00	2.64	0.15	111
Standard Deviation	0.06	41.25	22.61	2.20	3.37	45.23
Skewness	5.73	16:02	-0.82	-0.66	0.46	5
Kurtosis	52.99	294.62	3.28	7.10	2.89	36.05

B) Inferential findings

Hypotheses testing

1. The first hypothesis testing

To test the first hypothesis, multivariate models are used:

$$ILLIQ_{it} = \alpha_i + \beta_1 sysVol_{it} + \beta_2 Size_{it-1} + \beta_3 IO_{it-1} + \beta_4 Turn_{it} + \varepsilon_{it}$$

Before fitting the model to test the hypothesis, the method (fusion method or a panel) and hypothesis of the classical regression review.

F-Limer test results in table (4-7) is provided. As can be seen, the p-value equal to 0.045 and less than 0.05 and a panel data methods will be accepted. If accepted the panel data method, then it should Hausman test for selecting between random effects method and fixed apply. In the Hausman test, if probability of chi-square statistics is more than 0.05, should the random effects model and otherwise the fixed effects model is used. According to p-value of

Hausman test in the table (4-7) equal to 0.01 and less than 0.05, thus fixed effects method will be accepted.

Table 3: F-Limer test and Hausman Test

F-Limer test			Hausman Test		
F-Limer statistics	Probability	Result	Chi-square statistics	Probability	Result
1.3	0.045	Panel	13.5	0.01	Fixed effect

Assumptions of the regression model

Before fitting the model on the data, model assumptions should be analyzed:

The test of the lack of residuals autocorrelation

According to the Durbin-Watson statistic which is equal to 1.63, it was found that the model has not autocorrelation.

Table 4: Durbin-Watson statistics

The limit of lack of autocorrelation	Durbin-Watson statistic
< 2.5DW1.5<	1.63

Non- synchronicity test of residuals variance

According to the table below, and the p-value obtained for the test of White which is 0.22 and is greater than the significance level of 0.05 ($p\text{-value} \geq 0.05$), the null hypothesis (the existence of variance synchronicity) accepted which show, there is not non- synchronicity problem of residuals variance.

Table 5: Check the synchronicity of model variance

Statistics value	<i>p-value</i>
F-statistic(0.99)	0.22

The results of the analysis of the data in the table (6) reflected.

Table 6: The results of data analysis to test the second hypothesis

Variable	Coefficient	Standard deviation	t- statistics	P-value
<i>C</i>	4.81	0.66	7.27	0.00
<i>SYSVOL</i>	0.49	0.12	4.20	0.00
<i>SIZE</i>	-0.07	0.07	-1.05	0.30
<i>IO</i>	0.021	0.01	2.87	0.00
<i>TO</i>	0.10	0.01	8.24	0.00
R-squared		0.60	F-statistics	0.59
Adjusted R-squared		0.50	Prob(F-statistic)	0.00

According to Table 6 and the p-value, the t-statistic for systematic volatility variable of stock returns (SYSVOL) which is equal to zero and less than the error level of 0.05 ($p\text{-value} \leq 0.05$), null hypothesis (hypothesis based on the lack of effect of systematic volatility of stock returns on the stock liquidity) will be accepted and as result systematic volatility of stock returns effect on the stock liquidity. As a result, the second hypothesis is accepted. Also according to the systematic volatility variable coefficient of stock returns which is positive and equal to 0.49, conclude that systematic volatility of stock returns has a positive effect on stock liquidity. In other words, we can say, systematic volatility of stock returns increases stock liquidity.

Adjusted R^2 value of model equal to 0.50 which shows that 50% the variability of dependent variance explained by the independent variables, in other words 50% of the variability of dependent variable related to the independent variables.

2. The second hypothesis testing

To test the second hypothesis, multivariate models are used:

$$ILLIQ_{it} = \alpha_i + \beta_1 IdioVol_{it} + \beta_2 Size_{it-1} + \beta_3 IO_{it-1} + \beta_4 Turn_{it} + \varepsilon_{it}$$

Before fitting the model to test the hypothesis, the method (fusion method or a panel) and hypothesis of the classical regression review.

F-Limer test results in table (10) is provided. As can be seen, the p-value equal to 0.043 and less than 0.05 and a panel data methods will be accepted.

Table 7: F-Limer test and Hausman Test

F-Limer test			Hausman Test		
F-Limer statistics	Probability	Result	Chi-square statistics	Probability	Result
1.3	0.043	Panel	15.6	0.00	Fixed effect

Assumptions of the regression model

Before fitting the model on the data, model assumptions should be analyzed:

Examination of the lack of residuals autocorrelation

According to the Durbin-Watson statistic which is equal to 1.64, it was found that the model has not autocorrelation.

Table 8: Durbin-Watson statistics

The limit of lack of autocorrelation	Durbin-Watson statistic
$< 2.5DW1.5 <$	1.64

Non- synchronicity test of residuals variance

According to the table below and the p-value obtained for the test of White which is 0.25 and is greater than the significance level of 0.05 ($p\text{-value} \geq 0.05$), the null hypothesis (the existence

of variance synchronicity) accepted which show, there is not non- synchronicity problem of residuals variance.

Table 9: Check the synchronicity of model variance

Statistics value	<i>p-value</i>
F-statistic(0.95)	0.95

Table 10: The results of the analysis of the data to test the third hypothesis.

Variable	Coefficient	Standard deviation	t- statistics	P-value
<i>C</i>	6.06	0.75	8.03	0.00
<i>SYSVOL</i>	0.52	0.10	5.27	0.00
<i>SIZE</i>	-0.19	0.11	-1.70	0.09
<i>IO</i>	0.02	0.01	3.39	0.00
<i>TO</i>	0.10	0.01	7.56	0.00
R-squared		0.60	F-statistics	0.59
Adjusted R-squared		0.50	Prob(F-statistic)	0.00

According to Table 10 and the p-value, the t-statistic for unsystematic volatility variable of stock returns (IDIO) which is equal to zero and less than the error level of 0.05 ($p\text{-value} \leq 0.05$), null hypothesis (hypothesis based on the lack of effect of unsystematic volatility of stock returns on the stock liquidity) will be accepted and as result unsystematic volatility of stock returns effect on the stock liquidity. As a result, the third hypothesis is accepted. Also according to the unsystematic volatility variable coefficient of stock returns which is positive and equal to 0.52, conclude that unsystematic volatility of stock returns has a positive effect on stock liquidity. In other words, we can say, unsystematic volatility of stock returns increases stock liquidity.

Adjusted R^2 value of model equal to 0.50 which shows that 50% the variability of dependent variance explained by the independent variables, in other words 50% of the variability of dependent variable related to the independent variables.

Conclusion

Liquidity is an important aspect for process of allocating resources. Liquidity tells how close financial assets to cash. Liquidity of financial assets through its ability to convert assets into cash at any time and without losses is evaluated. Securities can be from the sufficient sale in the market turned into cash at any time but there is no guarantee against loss. One of the most important functions of the financial markets particularly the stock market, the conversion of assets into securities and increasing securities liquidity and reducing the risk premium on liquidity. Financial markets on the one hand, by providing a combination of money and capital market instruments meanwhile allocation facilitate the access to cash and also by improving the mechanisms and functions and regulations, securities market space converted to a safe environment and attractive for the public (Saidi and Dadar, 2010). Amihud & Mendelson(1991) concluded that companies are willing to adopt policies to increase the liquidity of their stock, as liquidity increased efficiency and value of the company. Investors because of the inseparable risk of investment expected returns. So for investors, aware of the

risk and return of investment have great importance. Lack of a financial asset liquidity is in fact the risk of that asset which expected investors to bear risk earn returns (Qaemi and Rahimpur, 2010). The liquidity degree of an investment when is lower that a fair price did not achieve speedily. Stock liquidity ratio for the investor's decision is effective in the formation of investment portfolio. In other words, logical investors for the stock that has less liquidity, demand more risk premium and the expected returns will be higher (Bortolotti et al, 2006).

The aim of this study was to investigate the effects of systematic volatility and unsystematic on stock liquidity using the AMIVEST liquidity criterion. The results showed the positive effect of systematic volatility of stock returns on the stock liquidity. In other words, we can say that systematic volatility of stock returns increases the stock liquidity. Also, the results showed that the systematic volatility of stock returns has a positive effect on the stock liquidity. In other words it can be said, unsystematic volatility of stock returns increases the stock liquidity. The results of this study that there is a positive correlation between stock returns and stock liquidity which is consistent with results of Datar et al (1998), Amihud (2002), Marti'nez et al (2005) and Deuskar (2006). However, does not match with research results of Marshall & Young (2003). The results of this research that there is a synchronization relationship between stock prices and liquidity is consistent with research results Acharya & Pedersen (2005).

References

- Ah, H., zhang, T. (2013). "Stock price synchronicity, crash risk, and institutional in vectors". *Journal of Corporate Finance*, 21, 1-15.
- Ahmadpur, Ahmad, Peykar negar Ghaleh roudkhani, Sedigheh. (2011) The relationship between profit quality and price synchronization listed companies in Tehran Stock Exchange, monthly management engineering, No. 40, pp. 82-86.
- Aminud ya kov (2002). I lli quidity and stock Returns: cross-section time-series Effects, *Jourhal of Financial Markets*, 5:31-56.
- Aminud, Y., H. Mendelso, and L. H. Pedersen, (2005), "Liquidity and Asset prices". *Foundations and trends in finance*, 4 , 269-364.
- Anvari Rostami, A., Larry Semnan, Behrouz. (2007) investigate relationship and analysis the effect of non-exchange investments on the investments interest of Tehran stock exchange, economic questionnaire, No. 27, pp. 177-218.
- Bortolottib, De long F, Nicodanog, Ibolya s (2006). Privatization and stock Market liquidity, *Journal of Ban king and Finance/ social scion Electronic publishing*.
- Chan, K., & chan, Y. C. (2011). "stock price synchronicity, Analyst coverage and pricing of seasoned Equity offerings" (PP. 1-57). Working paper.
- Deuskar, Prachi (2006). AFA 2007 chicagometings paper.
- Khaki, Gholam Reza. (2009) methodology in managing Tehran, Islamic Azad University
- Marshal Ben R, Martin yong (2003). Liquidity and stock returns in pure order-driven markets: evidence from the Aустaralian stock market, *International Review of financial Analysis*, 12 Extrapolative Expectations: Implications for volatility and li quidity: 173-188.
- Marti nez. Miguel A, Bele'n Nieto, Gonzalo Rubio, Mikel Tapia (2005). A set pricing and systematic liquidity risk: An Empirical investigation of the Spanish stock market, *International Review of Economics and finance*, 14: 81-103.
- Mashayekh, Shahnaz, Haraf Amou fin, Nasim (2011) the relationship between company size and volatility of stock returns in different market conditions, *financial accounting and auditing Bulletin*, No. 11, pp. 69-86.
- Moradzadhfar, Mohammad Abu hamzeh, Mina (2011) Effect of composition quality corporate on stock liquidity in listed companies in Tehran Stock Exchange, the *Financial Accounting Empirical Studies*, No. 32, pp. 73-102.
- Wu, W, S., Liu, Y. J., lee, Y. T., C. W. fok, R. (2007). "Hedging costs, liquidity, inventory management: the evidence from option market markers" *Jourhal of Financial Markets*.