A STUDY OF RELATIONSHIP BETWEEN MEASURE OF AMIHUD ILLIQUIDITY AND STOCK RETURNS IN TEHRAN STOCK EXCHANGE

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Abstract

The main objective of this study is examining the relationship between measure of Amihud illiquidity and stock returns in Tehran Stock Exchange (Iran). The basis of this measure is that if the stock price changes in reaction to a small volume of stock trading be significantly, Stocks will have lower liquidity (it means that measures of Amihud Illiquidity for it is high). Amihud illiquidity measure calculates stock market price reaction to order flows. In fact, this study seeks to answer the question that could Amihud illiquidity measure plays a significant role in stock returns of companies or not? For this purpose were collected the data of the 30 companies listed in Tehran Stock Exchange for the period 2006 to 2012 monthly. Research results show that there isn't significant relationship between returns and Amihud illiquidity measure.

Keyword: Amihud Illiquidity Measure, Stock Returns, Farvardin Effect

1. Introduction

To calculate returns obtained with regard to the purposes predetermined for a business unit is the first step in assessing it and since to increase shareholder wealth has been proposed as main objective of business units, therefore, an business unit must be so that increase shareholder wealth with obtaining appropriate return. Awareness of the factors affecting to increase stock returns can have be an important role in attracting investors (Joons, 2008).

Amihud measure is appropriate for markets that are without macro infrastructure of capital markets and don't have market developed. Data of criteria derived using statistic of returns and turnover during relatively long time periods (Saeidi & Dadar, 2010). This measure considered and applied for researchers as the new measure. Therefore, in this study we sought to examine the impact of these factors on stock returns.

2. Definition of the Problem and Research Objectives

Given the breadth and depth of markets in any financial market, there are various tools for investing and investors with respect to returns and investment risk accept the desired assets. Expected rate of return for asset represent loss returns under an equal risk of resulting from the acquisition of the assets (Yahyazadehfar & et al, 2010). Given high importance of stock returns, it is permissible to determine factors that can increase or decrease it, thereby reduce

investment risk to the extent possible. In this context, the aim of the present study specifically is to examine the relationship between measure of illiquidity and returns.

3. Theoretical Foundations

3.1. Stock Returns

To calculate returns obtained with regard to the purposes predetermined for a business unit is the first step in assessing it and since to increase shareholder wealth has been proposed as main objective of business units, therefore, an business unit must be so that increase shareholder wealth with obtaining appropriate return. By definition, the stock returns is all revenue and interests that shareholders obtained it during a period (Joons, 2008).

3.2. Measure of Amihud Illiquidity

Amihud in 2002 introduced measure for measuring illiquidity by providing a model. According to this model, if the turnover of the stock be low or during a specified period, trading days be low, as a result, the stock has low liquidity. Amihud measure is appropriate for markets that don't have major infrastructure for investment market and developed market. Data of this measure were derived using statistical returns and trading volume over relatively long time periods and although this measure has less accuracy but it can be calculated easily to study and investigate. Inverse measure of liquidity in this model has defined as the ratio of absolute returns, daily trading volume on the same day. Stocks with high Amihud illiquidity have large price changes for the small size of the transaction (Saeidi Dadar, 2010).

3.3. Farvardin Effect

Balaban (1994) claims that periodic effects is one of the models to predict the behavior of stock returns that can be exploited to obtain excess returns (abnormal returns). Some experimental tests have shown that use of trade-specific patterns based on the different times of day, month and year can lead to the creation of excess returns. Therefore effects of calendar or periodic can be regarded as one of the predicting factors and affecting the future behavior of the stock (Raei & Shirzadi, 2008). Farvardin effect is dummy variable and is equal to 1if be farvardin and is equal to zero otherwise.

4. Research Background

Salimpour (2005) in study with title "Examining effect of stock liquidity on excess stock returns of companies listed on the stock exchange" concluded that there isn't significant relationship between illiquidity of stock as a factor of risk and excess return of shareholders in the Tehran the Stock Exchange.

Bagher Mehmandoost (2007) in research in addition to explaining the concept of liquidity, examined correlation between two measures of stock liquidity (turnover ratio of stocks and Amihud measure) with leverage ratio using econometric techniques. Result showed that stock illiquidity makes to use liabilities financial managers and the use of financial leverage to provide further financial.

Yahyazedhfar & Khoramdin (2008) given the importance of the relationship between risk and return, has studied the impact of illiquidity risk and liquidity factors such as excess market return, firm size and the ratio of book value to market value, the excess stock return. Result of this research showed that all independent variables have a significant impact on the dependent variable of research. It means that impact of illiquidity and firm size on excess stock returns have been negative, but the impact of the excess market return and the ratio of book value to market value on excess stock returns have been positive.

Amihud (2002) stated that the expected market illiquidity has positive correlation with excess stock returns predicted, while illiquidity unforeseen has negative and significant

effect. In his research, he declared that part of the excess expected return can be expressed by mere illiquidity.

Chekili and Abaoub (2013) in study with title "Impact of liquidity on stocks returns: application on the tunis stock exchange" studied impact of liquidity on stocks returns in the tunis stock exchange. In this study, they used measures of Bid – Ask Spread, Turnover ratio and Amihud illiquidity measure to measure the liquidity of the stock. Research result showed that Bid – Ask Spread is a measure of liquidity in the Tunisian market and Amihud illiquidity measure (2002), ILL is a valid measure in this market.

5. Statistical Population and Sampling Method

The sample studied consisted of 30 companies that is selected among 50 companies that their reports be published by the exchange, in accordance with the following limitations from 2006 to 2012 monthly:

1. Companies should be listed before 2006/4/12 in the list of companies listed on the stock exchange and not be removed up to date 2013/3/19.
2. Their financial period be leading to 12 March
3. Fiscal years do not changing during the study.
4. During the course of study have continuous activity and their trading in the stock market was not disrupted for over four months.
5. Due to different nature of the activities don't be among investment companies, financial intermediaries, holding, leasing, and banks are not.
6. The financial statements of these companies be available.

6. Method of Hypotheses Testing

To investigate the relationship between the independent and dependent variables were used multivariate regression model. Hypothesis tested through the results obtained from econometric model and regression. Also to determine the significance of the coefficient of the independent variables in each model was used t-statistic at level of 95%. The necessary information after collecting during the research period enters to the software "Excel" and after necessary calculations was transferred to software "Eviews7".

7. Research Hypothesis

In this study by examining theoretical foundations of research was designed following hypothesis:

There is significant relationship between Amihud illiquidity measure and stock returns.

8. Variable's Research

Variables used in the model, type and method of calculation are specified in table 1.

Table 1: Introduction and method of calculation for research variables

variables	Type of variable	Symbol	Method of Calculation
Stock returns	Dependent	$R_{i,t}$	$R_{i,t} = \dfrac{P_{i,t} - P_{i,t-1} + D_t}{P_{i,t-1}}$
Amihud Illiquidity	Independent	$ILLIQ_{i,t}$	$ILLIQ_{i,t} = \dfrac{1}{D_{i,m}} \sum\limits_{i=1}^{D_{i,m}} \dfrac{|R_{imt}|}{VolD_{i,m}}$
market average rate of return	control	$R_{M,t}$	$R_{M,t} = \dfrac{M_1 - M_O}{M_O}$
Value of transactions	control	$CAP_{i,t}$	Turnover during Current month t × price of share in the past month
Market value to book value	control	$BMV_{i,t}$	$BMV_{i,t} =$ Market Value/Book value
Farvardin effect	control	$DFAR_{i,t}$	It is Equal to 1 if we are in Farvardin and is equals zero otherwise.

$VOLD_{imt}$: transactions volume of stock i on day t, and month m

D_{im}: Number of transaction days of stock i during month m.

M_0: Index value at beginning of period

M_1: Index value at end of period

$P_{i,t}$: price of stock i at the end of month t

$P_{i,t-1}$: price of stock i in early month of t

D_t: Cash profit of stock i in month t.

R_{imt}: Absolute value return of stock i on day t and for month of m

9. Research Findings

According to the research data have been extracted for the period of 7 years, from 2006 to 2012 for 30 companies monthly, in general, for each variable have the number 7* 30* 12= 2520 observation.

9.1. Inferential Statistic

In each study, it is essential that are performed the tests related to classical assumptions, In case of confirming all the assumptions can examine hypotheses raised in this study.

9.1.1. Assumptions of Classical Test

Table 2: Test of normality

Variable	Jarque-Bera statistic	sig
Dependent variable $R_{i,t}$	6.496386	0.069762
Residual	7.503565	0.073476

According to the test result, because level of significance for the dependent variable and the residual is greater than 0.05, it can be concluded that the normality assumption is satisfied.

Table 3: Regression Assumptions

Tests	statistic		Model	Significant

				of model
homogeneity of **variances**	Breusch-Pagan-Godfrey	F	1.3137	Verifying homogeneity
		sig	0.3179	
	Arch	F	1.538	
		sig	0.2150	
Auto-**correlation**	Breusch-Pagan-Godfrey	F	0.48	Lack of Auto-correlation
		sig	0.3179	

Given the classical assumptions regarding the research model has been verified, so we can test the model.

9.1.2. Stationary Test

Before estimating the model in studies with data related to time-series, should be examined stationary (constant variable distribution during time) studied variables, because if the variables are not stationary, will causes to create spurious regression.

Table 4: Stationary test for research variables

variable	Augmented **Dickey-Fuller Test**		**Phillips-Perron test**	
	Test Statistic	p-value	Test Statistic	p-value
$R_{i,t}$	513.247	0.000	755.577	0.000
$R_{m,t}$	381.834	0.000	598.138	0.000
$CAP_{i,t}$	299.068	0.000	633.108	0.000
$BMV_{i,t}$	81.050	0.0036	95.307	0.0001
$ILLIQ_{i,t}$	486.393	0.000	763.650	0.000
$DFAR_{i,t}$	682.323	0.000	460.517	0.000

Given the significance level obtained for Augmented Dickey-Fuller Test and Phillips-Perron test for all variables is less than 0.05, it can concluded that the research variables are stationary, so according to being stationary variables in the regression analysis, there is no the problem of creating spurious regression.

9.1.3. Examining Research Hypothesis

Hypothesis: there is significant relationship between Amihud illiquidity measure and stock returns.

To test this hypothesis, we use the following regression model. In following regression model, if coefficient of turnover ratio variable be significant, we can conclude that there is significant relationship between turnover ratio and stock returns and As a result, the above hypothesis can be confirmed.

Model (1) $\quad\quad R_{i,t} = \beta_0 + \beta_1 R_{M,t} + \beta_2 CAP_{i,t} + \beta_3 BMV_{i,t} + \beta_4 ILL_{i,t} + \beta_5 DFAR_{i,t} + \varepsilon_{i,t}$

In order to determine appropriate combination models or panel to estimate the regression model, we use F-Limer test. The results of these tests are shown in Table 5. Because F-Limer test significance level is less than 0.05, thus null hypothesis of this test is confirmed, the model pooled (combined) is appropriate to estimate model with this data.

Table 5: F-Limer test

H_0	F	df	sig	Result of test
Hybrid model is suitable	0.8356	29.2485	0.7167	H_0 Confirmed

The results obtained from estimation of model are shown in Table 6. Statistical hypothesis for research model is as follows:

H_0: there isn't significant relationship between Amihud illiquidity measure and stock returns

H_1: there is significant relationship between Amihud illiquidity measure and stock returns.

Table 6: Estimation of Model

Variable	Test Statistics	p-value	Result
Amihud Illiquidity	0.968698	0.3328	H_1
Average return of market	12.12201	0.000	Significant
Value of transactions	-0.243646	0.8075	Lack of significant
Market value to book value	4.436435	0.000	Significant
Farvardin effect	1.979957	0.0478	Significant

The results of coefficients significance test shows that because significant level of t-statistics for Amihud measure variable (in models with illiq shown) is greater than 0.05, thus, the null hypothesis is accepted, so it can said that relationship between Amihud measure variable and stock returns is not significant. So it can concluded that with 95% confidence cannot approve hypothesize "There's a significant relationship between Amihud measure and stock returns". Also because level of significance obtained for the control variables, the average market rate of return, ratio of the market value per share to book value and Farvardin effect is less than 0.05 concluded that coefficients of these variables are significant and given the positive sign of the coefficients of these variables can concluded that there is significant positive relationship between these variables and stock returns. Also, due to the significant level of control variable value of transactions, relationships of this variable with returns is not significant.

10. Conclusion & Recommendations

Due to lack of significant variable coefficients of Amihud illiquidity in the regression equation corresponding hypothesis, it follows that Amihud illiquidity variable as a measure of liquidity measures doesn't have significant relationship with stock returns. The test results is consistent with results of research Salim pour (2005), he acknowledged that there isn't significant relationship between Amihud illiquidity as risk factors and excess returns of a shareholder in Tehran Stock Exchange. Meanwhile researchers, such as Yahyazadehfar, Khoramdin (2008), Change & eta al (2010) expressed that there is significant and negative relationship between Amihud measure of illiquidity and stock returns and Amihud (2002) was noted this relationship is significant positive. Lack of a significant relationship between measures of illiquidity and stock return means that changes of this measure won't have impact on stock returns.

According to research done and result obtained following recommendations for future

research is suggested:

• For closer examination the present study can be used to separate industries.

• According to reject hypothesis of this study it is recommend that this study re-done, re-examining and results will be compared with the findings of this research.

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