Effect of Information Quality on Liquidity Risk of Tehran Stock Exchange Companies

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Abstract

In this paper we are going to assess the impact of information quality on liquidity risk mitigation of the firms listed in the Tehran Stock Exchange. It is assumed that higher quality of information reduces the market liquidity risk. The firms' information, economic conditions, and stock exchanges information are interpreted by investors appropriately and their interpretations will affect the stock prices. Therefore, the price will always be reflected from prevalent information.

The estimated results show that there is a positive and meaningful relationship between liquidity risk and information quality and it can be stated that by considering market and firms specifications of this study, the information quality is unable to decrease liquidity risk. Moreover, the results for the two groups of the firms with higher and lower information qualities, demonstrate that stock returns in the firms with higher information quality compared to the firms with lower information quality, will be less affected by changes in market liquidity. However, to make prompt decisions, it is required to enjoy sufficient transparent information.

Keywords: Information Quality, Liquidity Risk, Tehran Stock Exchange

Introduction

Information is a vital element in capital markets. Investors have accepted the risk of investing their own money into capital markets relying on the information provided by firms. They need accurate, complete, confident, credible, timely, and understandable information about the operating firm (Nobakht 2010). Thus, it is of a significant importance that the information available to the firms would be credible and it is critical to know to what extent these information are reliable. This issue is amongst the most decisive facts for risk-taking of the firms. In addition, the liquidity risk is one of the most related risks for economic firms. To this reason, we concluded to assess the impact of information quality on the liquidity risk of the firms listed in the Tehran Stock Exchange.

Increasing and rapid changes and developments in the economy are considered as major factors, which have led to uncertainty in economic environment. One of the managers' important responsibilities, at any level, is "decision making". The quality and the implementation process of decisions are of significant impact on the success and achievement of organizational goals. In other words, the destiny of the organization is dependent on how managers make decisions and is affected by their decisions' consequences.

Increasing advances in technology, globalization of the economy and trade, severity of environmental changes, and increases of uncertainty in the process of change, have caused the risk and uncertainty to become the integral elements of decision making process in organizations. As a result, administration of organizations has turned out to be more complicated than ever. All risks cannot be controlled, and organizations, especially those are facing more risk-taking projects, have no option but to increase their risk tolerance. The extent of risk that an organization can endure without suffering from irremediable losses could not be measured without analyzing the current risks (Monadya et al., 2007). For this reason,

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gaining sufficient and high-quality knowledge is of a very high importance, which can help executives to achieve their maximum efficiency.

Review of Literature

- Bulo et al. (2010) investigated the effect of changing independent auditor on information transparency of the firms listed in Tehran Stock Exchange from 2005 to 2008, and the results showed that changing independent auditor does not effect on the information transparency of the firms.

- Dianaty and her co-workers (2012) carried out a research to examine the relationship between the quality of accounting information and the risk measures for the shares in Tehran Stock Exchange. They analyzed the financial information of 56 stock exchange firms that their information were available for the study period (2008-2010), using structural equations modeling (SEM) approach. In order to assess the risk of stocks, they employed three variables of systematic risk, volatility of stock returns, and the ratio of book value to market value of shareholders' rights. The results demonstrated that the higher the quality of financial information, the more the decrease of stock risk measures. In other words, there is a negative correlation between quality of financial information and share risk measures.

- Rahmani and Amini (2011) accomplished a study, titled "Accounting standards and the quality of accounting information" and examined the effect of applying guidelines and accounting standards on the quality of accounting information in 52 firms in Tehran Stock Exchange. The relevance, timeliness, and conservatism were considered as indicators of the quality of accounting information and multivariate regression method were used for the period of before and after applying the accounting guidelines as well as before and after revising the accounting standards. The results showed that generally, the relevance, timeliness, and conservatism have increased in the period of enforcing accounting guidelines compared with the period before. But three mentioned indices have decreased significantly by revising the accounting standards. The results implied an increase in the quality of accounting information in the period after enforcing accounting guidelines in comparison with the period before, and a decrease in the quality of accounting information in the period after revising accounting standards relative to the period before.

- Kashani-Pour et al. (2010) assessed the relationship between corporate governance mechanisms and market liquidity. The population under study included all the firms listed in Tehran Stock Exchange during one year. The findings demonstrated that the firms with more independent board of directors and more effective approach of the board are of higher market liquidity than others. In fact, the firms with higher points in terms of the quality of corporate governance had a lower difference between the shares' bid and offer prices, and a higher difference between the supply and demand of stocks.

- Hejazi et al. (2010) studied the effect of information disclosure regulations on the quality of published information of the firms of Tehran Stock Exchange with regard to their profits. This study is of causal-comparative type and evaluates the effect of information disclosure regulations in Iran by comparing the quality of disclosure in three different periods (the period after regulations was split into two sub-periods). Kruskal-Wallis test was employed for comparison. The findings indicated that no decrease was observed in the percentage of profit prediction error, which seems to be related to the distrust in business environment. Consequently, after adoption of the regulations, the quality of disclosure in terms of timeliness was improved.

- Etemadi et. al. (2009), studies the impact of organizational culture, ownership concentration, and ownership structure on the quality of financial information of 105 firms of Tehran Stock Exchange through some of organizational aspects influencing on quality of financial information. They used structural equation modeling via partial least squares estimating method. The results showed that three factors of organizational culture, ownership concentration, and ownership structure affect the quality of financial information of the firms. Ownership structure had the lowest direct effect on quality of information, but its most important role is its moderating effect impacts on relationship between

organizational culture and quality of financial information, and also on relationship between ownership concentration and quality of financial information.

- Cohen (2006) investigated the economic measures and consequences of financial information quality. The results indicated that the lower the quality of financial information, the higher will be the capital costs for owners. Furthermore, firms with higher quality of financial information have more information asymmetry, and are faced with less ambiguity and risk.

- Brockman and Chung (2003) carried out a study about the relationship between the system of supporting investors and liquidity in Stock Exchange of Hong Kong. They concluded that the firms with lower price difference (i.e. the difference between bid and offer prices) and higher depth (i.e. higher volume of transactions) enjoy a stronger system of protecting investors than other firms. They interpreted that supporting weak shareholders would lead to weak stock liquidity (an asset is defined liquid if can be changed to cash quickly at low cost, (Chordia, Roll, and Subrahmanyam (2007)).

- Pastor and Veronesi (2003) found out that uncertainty in the firm's profitability might provide volatility in the efficiency. Moreover, the poor quality of financial reporting would increase uncertainty in profitability.

- Chen et al. (2007) examined the effect of disclosure and corporate governance on stock liquidity. Lack of proper disclosure and poor transparency ranking index as corporate governance criterion led to serious information asymmetry for the selected firms. They also applied price difference (i.e. difference between bid and offer prices) as a criterion to assess liquidity. Their findings confirm that poor disclosure procedure in firm is resulted from weak corporate governance, and eventually, it is associated with higher risk of information asymmetry. Furthermore, as a key result, it leads to tendency for increasing price gap by liquidity suppliers.

- Barton (2004) looked into the role of financial information quality in loss of investment. The results demonstrated that firms' shareholders with higher information quality, compared to those with lower information quality, have experienced far less losses. The results also showed that weak economic data would lead to market crash or would create price bubble in stock market.

- Kim et al. (2008) investigated the quality of accounting information effects on stock prices. They concluded that increasing the quality of firms' accounting information (i.e. accruals' quality) can reduce price volatility and as a result, their final deal prices will be closer to initial offer prices.

Method

Purpose of this study is to find a method to assess the impact of information quality on liquidity risk mitigation of the firms listed in the Tehran Stock Exchange. It is assumed that higher quality of information reduces the market liquidity risk. According to Poster and Stembag (2003), liquidity risk is a function of market characteristics (Mc) such as stock liquidity and return volatility as shown in the following stochastic equation:

$$\beta_{i,t}^L = \omega_0 + \omega_1{}^*Mc_{i,t-1} + \varepsilon_{i,t} \tag{1}$$

Where $\beta_{i,t}^L$ is liquidity risk and $Mc_{i,t-1}$ is a vector of market indicators, which is expected to be effective on liquidity risk. Jaffrey (2011) expanded the above equation, and added quality of accounting information quality (Iq) and the firm characteristics (Fc) variables as:

$$\beta_{i,t}^L = \omega_0 + \omega_1{}^*Iq + \omega_2{}^*Mc_{i,t-1} + \omega_3{}^*Fc_{i,t-1} + \varepsilon_{i,t} \tag{2}$$

Where, quality of information may include profit accuracy, accrual quality, and the analyst's notion. In addition to market characteristics, firm properties have also been added. In current study, based on the above equation, impact of data quality, market characteristics, and properties of the selected firms on liquidity risk are examined.

Historical information of Tehran Stock Exchange firms was gathered by utilizing "Rahavard Novin" software. A sample was extracted from the population under study, including all the firms listed in Tehran Stock Exchange (during the period of 2007-11), by using systematic elimination method. For this purpose, all members of the population selected with following features as sample:

- Firms that their financial year ending 20 March of each year
- Firms that have not altered their financial year between 2007 and 2011.
- Firms with no financial freeze in all years of the study period.
- Firms that all their information related to the study variables are available.

According to first constraint, number of firms that their financial year end 20 March between 2007 and 2011 are shown in table 1.

Table 1 - Results of the 1st constraint

Sample size	2011	2010	2009	2008	2007
1265	194	178	284	307	301

Then, by applying the two other conditions 120 firms were opted and by applying the last condition, a statistical sample of 100 firms was obtained. After collecting the required information for variables, by using descriptive statistics, normality of data was investigated.

Empirical Investigation

Model of Poster and Stembag (2003), and Jeffrey (2011) was used to examine the effects of information quality variables, market and firm characteristics on liquidity risk as follows:

$$\beta i, t = \omega_0 + \omega_1{}^*Iq + \omega_2{}^*Mc_{i,t-1} + \omega_3{}^*Fc_{i,t-1} + \varepsilon_{i,t} \tag{3}$$

Where

$\beta i, t$: Liquidity risk of the ith firm in year t

Iq: Information quality including accruals' quality and profit accuracy.

Mc: Market characteristics including stock liquidity, stock transactions volume, and stock return.

Fc: Firms characteristics including market value and stock volatility return.

F-Limer test was employed to choose pooled regression or panel regression models. This test is based on coefficient of determination (R^2) for the two methods, and assesses whether R^2 for fixed effects regression, is significantly greater than R^2 of pooled or panel regressions. The test statistic is presented as:

$$F = \frac{R_{EF}^2 - R_{POOL}^2/(n-1)}{(1 - R_{EF}^2)/(nt - n - k)}$$

Where

R_{EF}^2: Coefficient of determination of fixed effects regression

R_{POOL}^2: Coefficient of determination of the pooled regression (common y-intercept)

n: Number of independent (explanatory) variables.

H_0: Null hypothesis indicates that pooled data better explains the dependent variable. On the other hand, the alternative hypothesis (H_1) expresses that panel data better explains the dependent variable. The results exhibits that the used data structure is panel. Due to the significance level of F-Limer test, which is less than 0.05, the null hypothesis is rejected and the alternative hypothesis is accepted (table 2.)

Table 2 - Results of F-Limer test

Null hypothesis	Models	F-Limer statistics	P-value	Test results
The data structure is integrated.	1st equation	4.28	0.000	Null hypothesis rejected
	2nd equation	1.47	0.000	Null hypothesis rejected
	3rd equation	1.42	0.000	Null hypothesis rejected

Source: Research findings

Hausman test was also used to help in selecting and applying fixed or random effects methods. Hausman statistic has asymptotic chi-square distribution with degrees of freedom equal to the number of explanatory variables. Alternative hypothesis (H_1) indicates the significant difference between estimated coefficients of fixed and random effects methods. Random effects method is approved when null hypothesis (H_0) is accepted and fixed effect method is approved when H_1 is accepted. Hausman test results for the first, second, and third equations, verified the estimation by fixed effects method as shown by table 3.

Table 3 - The results of the Hausman test (selection among fixed and random effects)

Null hypothesis	Models	Chi-square test	Degrees of freedom	P-value	Test results
There is no difference in coefficients.	1st equation	87.98	8	0.000	Null hypothesis rejected
	2nd equation	215.34	8	0.000	Null hypothesis rejected
	3rd equation	11.55	8	0.000	Null hypothesis rejected

Source: The research findings

In order to test the first hypothesis, the research model was estimated using panel regression, and for the second hypothesis, the sample firms were divided into two groups based on having higher information quality (both the higher accrual quality and higher profit accuracy). Results of estimation for the main model for testing the first hypothesis are as follow s in table 4.

Table 4 - Results of estimation of the first regression equation

Dependent variable: Liquidity risk
Method: Panel EGLS
Time frame: 2007-2011, Years of observations: 5 years
Sample size: 100
Total number of observations: 500

Variable	Coefficient	Standard error	t-Statistics	Significance level
Intercept	-0.052	0.045	-1.14	0.25
Accrual quality	$2.28*10^{-8}$	$1.59*10^{8}$	1.97	0.047
Profit accuracy	$6.11*10^{8}$	$2.13*10^{8}$	2.86	0.004
Stock liquidity	$1.48*10^{5}$	$7.44*10^{6}$	1.99	0.041
Transactions volume	$2.79*10^{9}$	$3.96*10^{9}$	0.69	0.48
Stock returns	$2.96*10^{6}$	$1.49*10^{6}$	1.989	0.043
Market Value	$-2.89*10^{15}$	$2.19*10^{15}$	-1.32	0.187
Stock volatility return	0.000441	0.000124	3.55	0.0004

Coefficient of determination: % 63
F statistic: *1.87
Significance level: (0.00<0.05)
Durbin-Watson statistics: 2.47

Results from F statistic showed the significance of the first regression model at 95 percent significance level (0.00<0.05). The model's R^2 presents that the model can explain up to 63% of variations of dependent variable (liquidity risk) by independent variables. Durbin-Watson statistics (2.47) reflects the lack of serial correlation among residuals. Model's coefficients indicated that there is a positive and meaningful relationship between liquidity risk, accrual quality, profit accuracy, stock liquidity, stock returns, and stock volatility return. Significance levels of the concerned coefficients test are all less than
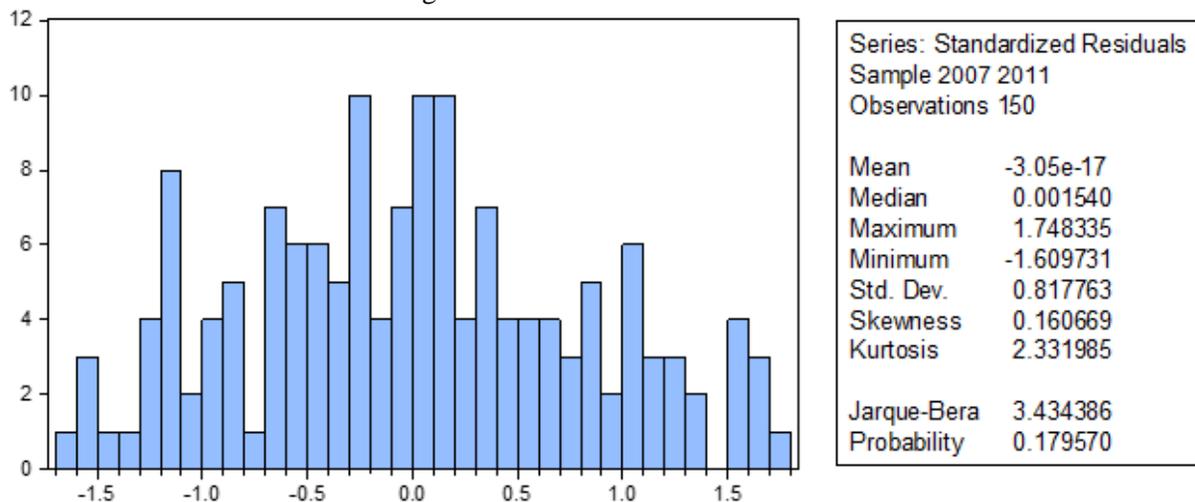
0.05. There was no significant relationship between liquidity risk, transactions volume, and market value. Estimation results of the model for the firms with higher accrual quality are shown by table 5.

Table 5 – Results of estimation of model for the firms with higher accrual quality

Dependent variable: Liquidity risk Method: Panel EGLS Time frame: 2007-2011, Years of observation: 5 years Sample size: 30 Total number of observations: 150				
Variable	**Coefficient**	**Standard error**	**t-statistics**	**Significance level**
Intercept	0.237	0.067	3.525	0.0006
Accrual quality	$-3.98*10^8$	$1.97*10^8$	-2.02	0.041
Profit accuracy	$-2.34*10^7$	$7.47*10^8$	-3.133	0.0019
Stock liquidity	$-2.35*10^6$	$1.07*10^5$	-2.018	0.82
Transaction volume	$3.93*10^9$	$7.58*10^9$	0.518	0.6
Stock returns	0.00018	0.000032	5.504	0.01
Market Value	$2.68*10^5$	$5.84*10^6$	4.578	0.000
Stock volatility return	$-2.69*10^{15}$	$2.83*10^{15}$	0.949	0.344
Coefficient of determination: % 52 F statistics: *3.41 Significance level: (0.00 <0.05) Durbin-Watson statistics: 2.61				

F statistic and coefficient of determination exhibited that the model under study can explain up to 52% of the variations of liquidity risk. Durbin-Watson statistics (2.61) is satisfactory. Coefficients are significant for accrual quality, profit accuracy, stock returns, and stock volatility return and there is a meaningful relationship between liquidity risk and information quality components. But there is a positive relationship between liquidity risk and stock volatility return. Moreover, there is no significant relationship between liquidity risk, and other market and firms quality variables. Residuals of the estimated model are normal and considering Jarque-Bera statistic (lower than 2) and level of significance (above 0.05), the null hypothesis of non-normality of residuals is rejected.

Histogram of the second model's residuals

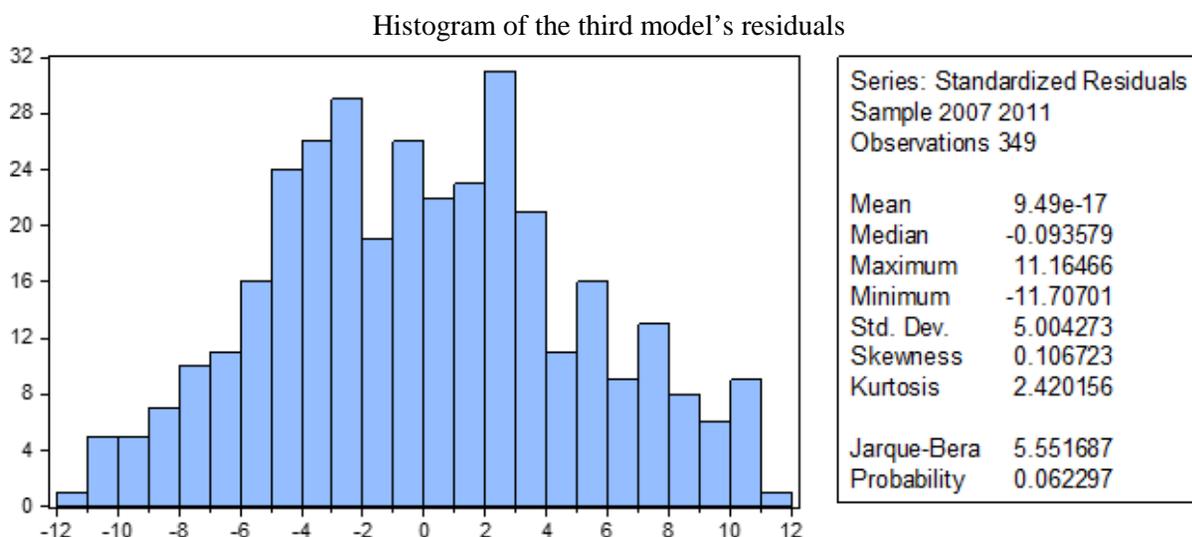| Series: Standardized Residuals Sample 2007 2011 Observations 150	
Mean	-3.05e-17
Median	0.001540
Maximum	1.748335
Minimum	-1.609731
Std. Dev.	0.817763
Skewness	0.160669
Kurtosis	2.331985
Jarque-Bera	3.434386
Probability	0.179570

Estimation results of the model for the firms with lower accrual quality are shown by table 6.

Table 6 - Results of estimation of the model for the firms with lower accrual quality

Dependent variable: Liquidity risk				
Method: Panel EGLS				
Time frame: 2007-2011, Years of observation: 5 years				
Sample size: 70				
Total number of observations: 350				
Variable	**Coefficient**	**Standard error**	**t-statistics**	**Significance level**
Model's constant coefficient	-0.25	0.066	-3.87	0.0001
Accruals' quality	$3.87*10^8$	$3*10^8$	1.289	0.198
Profit accuracy	$3.07*10^8$	$2.06*10^8$	1.492	0.138
Stock liquidity	$3.49*10^5$	$1.24*10^5$	2.79	0.005
Transaction volume	$5.94*10^9$	$4.23*10^9$	1.406	0.16
Stock returns	0.000546	0.000113	4.822	0.000
Market Value	$1.35*10^6$	$1.39*10^6$	0.968	0.33
Stock volatility return	$-7.82*10^{15}$	$6.05*10^{15}$	-1.292	0.197
Coefficient of determination: % 26				
F statistics: *2.3				
Significance level:(0.004<0.05)				
Durbin-Watson statistics: 2.37				

F statistics and coefficient of determination show that the model has low explanatory power of 26%. Durbin-Watson statistics (2.37) is satisfactory. Model's coefficients indicated that there is a positive significant relationship between liquidity risk and, stock liquidity and stock returns and there is no significant relationship between liquidity risk, and other information quality components including market and firm information quality.

Residuals of the estimated model are distributed normally and at 5 percent level of significance Jarque-Bera statistic rejects the null hypothesis of non-normality of residuals.

Histogram of the third model's residuals

Series: Standardized Residuals	
Sample 2007 2011	
Observations 349	
Mean	9.49e-17
Median	-0.093579
Maximum	11.16466
Minimum	-11.70701
Std. Dev.	5.004273
Skewness	0.106723
Kurtosis	2.420156
Jarque-Bera	5.551687
Probability	0.062297

Finally, two hypotheses were selected:

<u>Hypothesis 1:</u> The quality of information could reduce the liquidity risk.

Estimation of the first equation shows that there is a positive and meaningful relationship between liquidity risk and information quality components such as accrual quality and profit accuracy. The results demonstrate that in the firms listed in Tehran Stock Exchange, information quality can increase liquidity risk very low, and is negligible and however, liquidity risk cannot be reduced. Therefore, the first hypothesis is rejected.

<u>Hypothesis 2:</u> The stock return with higher information quality will be less affected by changes in market liquidity.

Estimation the second equation shows that for firms with higher information quality, the coefficient of stocks returns is 0.00018. Estimation of the third equation reflects that for the firms with lower information quality, the coefficient of stock returns is 0.000546.

Conclusion and Recommendations

Hypothesis 1 studies the decreasing impact of information quality on liquidity risk. The estimated main regression model shows that there is a positive and meaningful relationship between liquidity risk and information quality and the first hypothesis of the existence of a negative relationship between liquidity risk and information quality is rejected. Thus, it can be stated that by considering market and firms specifications in this study, the information quality is unable to decrease liquidity risk. The achieved result is incompatible with findings of Jeffrey (2011).

Hypothesis 2 examined the lower effectiveness of stock returns by market liquidity variations in the firms with higher information quality. The results for the two groups of the firms with higher and lower information qualities, demonstrate that stock returns in the firms with higher information quality compared to the firms with lower information quality, will be less affected by changes in market liquidity. These results are in agreement with the Jeffrey's (2011).

To make prompt decisions, it is required to enjoy sufficient transparent information. The firms' information, economic conditions, and stock exchanges information are interpreted by investors appropriately and their interpretations will affect the stock prices. Therefore, the price will always be reflected from prevalent information. These information should be accessible to everyone for free (Abdollah-Zadeh, 2002).

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