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Impact of Information Risk on the Liquidity Risk of the Firms Listed on the Tehran Stock Exchange

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Abstract

Liquidity risk is one of the new topics in the financial management widely considered by the capital market scholars. Most investors, stakeholders and managers are seeking to achieve the satisfactory return and that is why they are confronted with risk and should establish a balance between risk and return. Therefore, it seems essential to investigate the risk and the related factors. The present paper aims to examine the impact of information risk on the liquidity risk. To test the hypotheses, the data of 52 listed firms on the Tehran Stock Exchange during 2006 to 2010 have been collected and analyzed by the multivariate regression. The findings confirm that there is a significant positive relationship between the index of information risk (income smoothing) and liquidity risk.

Keywords: Information Risk, Income Smoothing, Earnings Quality, Liquidity Risk, Three-Factor Model of Fama and French

Introduction

Today, the accounting information system plays a key role in the organizational operations of the economic environment. Economic decisions are made based on the figures and data on these systems. Financial reporting in the economic entities reflects the information needs and expectations of the users of the financial statements. As a result, the objectives and methods of reporting are developed to expand the information needs of the users because the proper decisions require reliable information provided by the financial reporting (Ardakani, 2008).

The information related to the managers, investors and other users should be qualified. The financial statements are the final products of the accounting system and financial reporting aims at providing the summarized and classified information about the financial position, performance and flexibility and are used by a wide range of decision makers. Based on the theoretical concepts of the financial reporting, the useful information should have some qualified specifications which are mainly related to the relevancy and reliability (Bolu *et al.*, 2011).

Reported profit of the firms is a significant element of decision making which has been used by a wide range of users such as shareholders, investors and other agents. The estimated accounting methods impact the computation of earnings and the managers are responsible for the financial statements; that is why the managers manipulate earnings for specific purposes. On the other hand, the investors pay special attention to the figure of earnings because it is considered as an essential element in making decisions (Ghorbani et al., 2010).

Statement of Problem and Theoretical Bases

The managers of the financial distressed firms tend to improve the bottom line and change the informational content. Earnings management is one of the methods used to reflect a better image of the financial position. However, the earnings might be manipulated which would lead to the loss of credibility. The opportunistic manipulation of the earnings occurs when the managers endeavor to satisfy their personal interests. On the other hand, management practices might be due to another reason. The availability of the security information and dominance over the future information motivate managers to implicitly select the accounting trends and transfer the personal information to the other users of the accounting reports. This would mitigate the information asymmetry among the managers, shareholders and other stakeholders and would also increase the value of the earnings related to the other performance measures such as operating cash flows. The role of the auditors in the attest function constraints the opportunistic behavior of the managers (Azin et al., 2010).

The capital asset pricing model is a framework developed to measure the relationship between risk and return and uses a proper theory and methodology to evaluate the investments in a situation in which it is expected to achieve future earnings. In terms of capital budgeting, the firms should measure the expected return. In the decision making process, this feasibility is known as the risk level. In other words, risk is defined as a lower real return on investment (Fard, 2010).

The asset valuation is one of the main subjects of investment. The intrinsic value of each asset is the present value of the future cash inflows considered in addition to the discount rate. The expected discount rate or expected return is the lost return under equal situations of risk. Asset liquidity is one of the effective factors on the risk. The liquidity risk plays a significant role in asset valuation because the investors highly consider whether the assets are going to be sold or there is a market for them. The empirical evidences show that the liquidity is essential in decision making. The developed markets provide new instruments for the accountability of the investors' needs. The higher return on assets is more risky and that is why the liquidity is one of the effective factors of risk. The lower liquidity makes the shares less interesting (Sirani et al., 2011).

Examining the relationship between information risk (income smoothing) and liquidity risk, the significance of the accounting information in the capital market has been empirically examined and it is determined whether the accounting information is used by the investors and other stakeholders. Confirming this relationship, it is concluded that the higher quality of accounting information plays a role in improving the market performance and reducing the risk and cost of equity. The present paper seeks to discover the factors related to the role of accounting information in liquidity risk. The findings of this study might improve the quality of the accounting information.

Theoretical Background

There are different choices for the investment and the investors have the authority to select a choice based on the specifications of risk and return. Investments in the financial assets have been always accompanied by risk and uncertainty which will finally threaten the return and capital. Therefore, it seems necessary to consider the risk factor in the investments. Clearly, the competitive globe intends to maximize the wealth of the shareholders and other stakeholders and minimize the cost of capital through reducing the investment risk. The investors are confronted with the liquidity risk. This risk derives from the lack of the cash for the repayment of the debts. Consequently, it seems that the liquidity risk and its effective components should be examined in the capital market.

The present study seeks to explain the relationship between information risk measured by the income smoothing and liquidity risk.

Lara *et al* (2005) investigated the impact of earnings management on the time asymmetry of the earnings. They concluded that increasing conservatism is due to the operational and commercial environment and will finally increase the time asymmetry of the earnings.

Lafond *et al* (2007) explored the relationship between income smoothing, corporate governance and liquidity. They found that the firms with higher discretionary smoothing have lower liquidity and the volume of their transactions is lower. On the other hand, natural smoothing is directly associated with the liquidity. In other words, the investors believe that the discretionary and accrual smoothing are different so that the discretionary smoothing reduces their tendency to trade the stocks.

Cornett *et al* (2008) examined the impact of institutional investors and earnings management and found that the institutional ownership governs the aggressive accounting behavior. In addition, they showed that the ownership percentage of the institutional shareholders, the number of the institutional shareholders and the ratio of the board members who are appointed by the institutional shareholders, significantly decrease the average discretionary accruals and earnings management.

Richie (2009) conducted a study about the income smoothing and the cost of equity. Segregating the findings, it was revealed that those firms with higher income smoothing have lower cost of equity and higher ranking of the equity.

Pinghsun *et al* (2009) examined the potential impact of artificial smoothing and real smoothing on the firm value. The findings of this study confirmed that the firm value reduces because of higher artificial smoothing; however, their findings indicated that more income smoothing would increase the firm value. They also declared that the firms can increase the awareness of the managers and mitigate the agency costs.

Iatridis (2010) investigated the impact of accepting International Financial Reporting Standards (IFRS) on the quality of the reported figures in the financial statements. In addition, the authors documented that implementing the international accounting standards would improve the quality of the accounting figures and reduce the authority of the earnings management. This study suggested that the lower information asymmetry and manipulation of the earnings lead to higher quality information and more unbiased judgments.

Chang and Shiva (2010) evaluated the impact of earnings management on the predictive ability of the earnings. When examining the impact of earnings management on the predictive ability of the different deciles, it was found that the upper deciles have lower predictive ability and it confirms the awareness of the earnings management. Finally, the results showed that the opportunistic earnings management has not been confirmed.

Ng (2011) examined the impact of information quality on the liquidity risk for the firms listed on the Tehran Stock Exchange during 1983 to 2008 with a sample composed of 306624 firm-month observations. Using the regression equation and the relationship between these variables, it was found that the higher quality of the information is associated with the lower liquidity risk. Furthermore, it was shown that this relationship results in lower cost of equity which is cost effective. The inverse relationship between information quality and liquidity risk is stronger in the market in which the unexpected changes in the market liquidity occur. However, as a relational mechanism between information quality and cost of equity, the market risk is of lower significance than the liquidity risk.

Lischewski and Voronkova (2012) investigated whether size, value and liquidity are really affecting the securities market. The results of the developed markets in the central and Eastern Europe and Poland revealed that these markets are developed when the size, market and value are considered. In contrast with the expectations, there were no evidences found for confirming that the liquidity is an effective factor in the emerging and new markets.

Gill and Biger (2013) tested the impact of corporate governance on the efficiency of the working capital management of the manufacturing listed firms from 2009 to 2011. The sample is composed of 180 listed firms on NYSE. The findings of this study suggest that the corporate governance plays a key role in improving the efficiency of the working capital management.

Methodology of Research

This is a correlation descriptive study because it investigates the relationship between the variables. In addition, this is an applied study because the findings of the study might be used for decision making purposes.

To calculate the information risk and estimate the coefficients of Fama and French, the information for the years of 2002 to 2005 has been used and the relationship between the main variables have been examined for a period from 2006 to 2010.

The following hypothesis is developed for examining the research questions:

There is a significant relationship between income smoothing and liquidity risk.

Population and Sampling

Using the filtering technique of sampling, the sample firms have been selected from the firms listed on the Tehran Stock Exchange. The sample firms have the following characteristics:

- The end of their fiscal year is consistent with the calendar year.
- The stocks of these firms have been exchanged for at least 100 days on the Tehran Stock Exchange.
- The firms are not classified as insurance, investment or financial intermediaries.
- The data about the research variables are available for the selected firms.

Based on the above characteristics, 52 listed firms on the Tehran Stock Exchanges have been selected as the sample.

a. Data Collection Method

Using library studies and prior literature, the required information has been gathered. To test the hypotheses, specific journals, official site of the central Bank of Iran and the information in the financial statements have been employed. Verified software and databases such as Rahavard-e-Novin and other ones have been also employed to collect the data. To

analyze the research findings, multivariate regression has been used in EXCEL and SPSS software. The confidence level intended to be 95 percent.

b. Variables and Models

The variables of this study are classified into three categories including independent, dependent and control variables:

Independent Variables

Some scholars believe that the smoothed income will maximize the benefits of the managers and that is why the shareholders are misled and try to manipulate earnings for maximizing their compensation. Through the income smoothing, the managers might hide the changes in the economic performance of the firms by using changes in the accounting and financial reporting. From this point of view, income smoothing shows the low quality of the earnings. On the other hand, some believe that the managers use secured information about the future earnings for temporary income smoothing in order to reach at the normalized income. The more income smoothing is always an indicator of the high quality earnings (Saghafi and Marfou, 2011, 18-19).

Income smoothing has been considered as the independent variable. To measure the income smoothing, the ratio of the standard deviation of the net income (normalized based on the total assets of the previous year) to the standard deviation of the operating cash flows (normalized based on the total assets of the previous year) has been employed:

$$\text{Smooth}_{it} = \delta (NI_{it}) / \delta (CFO_{it})$$

(1)

NI: Net income before tax

CFO: Operating cash flow

In the above formula, the higher (lower) amounts of Smooth show the low (high) smoothing.

Dependent Variable

The present study uses liquidity risk as the dependent variable and is considered as the coefficient of β^l in the three-factor Fama and French model:

$$r_t - r_{f,t} = \alpha + \beta^M \text{MKT}_t + \beta^S \text{SMB}_t + \beta^H \text{HML}_t + \beta^l \text{IMV}_t + \epsilon_t$$

(2)

r: Return

r_f : Risk free rate of return

α : Constant

$\beta^M, \beta^S, \beta^H, \beta^l$: Coefficient of factor, market, size, value and illiquidity

MKT: Market factor

SMB: Size factor

HML: Ratio of book value to the market value

IMV: Illiquidity factor

t: Time

Using Fama and French model (1993), the portfolio is formed through size and market to book value ratio and adding the illiquidity factor. However, 52 firms listed on the Tehran Stock Exchange are classified into two groups of small (S) and big (B) firms. Then, each group is classified into three groups of high (H), medium (M) and low (L) and the three other subsidiary groups including illiquid (I), median liquid (N) and very liquid (V). Therefore, 18 portfolios are formed as follows:

(S,L,V), (S,L,N), (S,L,I), (S,M,V), (S,M,N), (S,M,I), (S,H,V), (S,H,N), (S,H,I), (B,L,V), (B,L,N), (B,L,I), (B,M,V), (B,M,N), (B,M,I), (B,H,V), (B,H,N), (B,H,I)

The first factor (MKT) is the market risk premium which is the beta factor of the developed model by CAPM and is called the market factor. The market risk premium is the difference between market return and risk free rate of return. The market return is the ending total index minus the total beginning index divided by the total beginning index and the risk free index is the same as the interest rate of the government bonds.

Following developed model of Fama and French (1993), the second factor of size (SMB) is calculated by the difference between average return of nine formed portfolios of small firms (S,L,I), (S,L,N), (S,L,V), (S,H,N), (S,M,I), (S,M,N), (S,M,V), (S,H,I) and also the average return of nine formed portfolios of big firms including (B,M,N), (B,M,V), (B,L,I), (B,L,N), (B,L,V), (B,H,I), (B,H,N), (B,H,V) and (B,M,I).

The third factor is the ratio of book value to the market value of the stocks (HML) which is calculated by the difference between the average return of six formed portfolios of stocks with high ratio of book value to the market value (S,H,V), (S,H,N), (S,H,I), (B,H,N), (B,H,I), (B,H,V) and the average return of six formed portfolios with low ratio of book value to the market value (S,L,I), (S,L,N), (S,L,V), (B,L,I), (B,L,N), (B,L,V).

The fourth factor of illiquidity (IMV) is the difference between the average return of six formed portfolios of the very liquid firms (B,H,V), (B,M,V), (B,L,V), (S,L,V), (S,M,V) and (S,H,V) and the average return of six formed portfolios of illiquid firms (B,H,I), (B,M,I), (B,L,I), (S,L,I), (S,M,I) and (S,H,I).

The present study employs the illiquidity measure of Amihud which is calculated as follows:

$$ILLIQ_{it} = \frac{1}{D_{it}} \sum_{d=1}^{D_{it}} \frac{|R_{idt}|}{V_{idt}}$$

(3)

ILLIQ: Illiquidity ratio

D_{it} : Number of days of trade on stock i in month t

R_{idt} : Return on stocks i in day d of month t

V_{idt} : Volume of trades on stock i in day d of month t.

c. Control Variables

The control variables of the study are as follows:

Size: Firm size calculated by the natural logarithm of the capital.

Book-to-Market ratio: This ratio is calculated by dividing the book values of owners' equity to the market value of the owner's equity.

Capital Intensity: The ratio of net property, plant and equipment to the total assets.

Cash Ratio: The ratio of cash and cash equivalent to the current debts.

β^M : Coefficient of market factor

β^S : Coefficient of size factor

β^H : Coefficient of value factor

d. Model of the Study

The model of this study is as follows:

$$it^l = \psi_0 + \psi_1 \text{Informative Risk}_{it} + \psi_2 \beta_{it}^M + \psi_3 \beta_{it}^S + \psi_4 \beta_{it}^H + \psi_5 \text{Size}_{it} + \psi_6 \text{Book-to-Market}_{it} + \psi_7 \text{Capital Intensity}_{it} + \psi_8 \text{Cash Ratio}_{it} \quad \beta(4)$$

In this model, β is the liquidity risk measure of the firm i in year t and Earnings Quality is the quality of accruals and residual variables of the control variables which were described before.

Findings

e. Descriptive Statistics

Table 1. Descriptive Statistics

Variable	Mean	Median	Std. Deviation	Skewness	Kurtosis	Minimum	Maximum
Capital intensity	0.215	0.164	0.182	1.166	0.852	0.0016	0.8321
Cash ratio	0.084	0.047	0.157	8.919	108.490	0.0023	2.1108
Smooth	0.905	0.627	0.981	4.479	30.187	0.1009	8.7076
Size	27.284	26.902	1.454	0.827	-0.125	23.8749	30.7716
Book-to-market	0.467	0.301	0.604	7.216	77.748	0.0077	7.2770
β^M	1.866	30.429	722.382	-9.946	122.601	-9049.480	2309.350
β^S	0.7184	-0.133	12.9562	8.828	99.571	-35.99	153.310
β^l	0.411	-0.2399	40.476	10.711	145.694	-160.28	531.47
β^H	-0.3103	-0.2081	9.875	8.914	119.648	-43.65	122.840

f. Hypotheses Testing

There is a significant relationship between income smoothing and liquidity risk.

Table 2. Regression model

Source of change	Degree of freedom	Sum of squares	Average squares	F	Sig. level	Adj. R ²
Regression	8	752.338261	42282.719	16111.282	0.000	0.999
Residual	147	385.789	2.624			
Total	155	338647.542				

Table 3. Regression coefficients

Variable	Coefficient	Std. Deviation	t	Sig. level
Constant	2.103	2.499	0.842	0.401
Capital intensity	0.431	0.706	0.611	0.542
Cash ratio	-0.089	1.380	-0.064	0.949
size	-0.071	0.090	-0.788	0.432
Book-to-market	-0.188	0.356	-0.528	0.598
β^M	-0.008	0.001	-9.750	0.000
β^S	0.770	0.025	30.847	0.000
β^H	2.783	0.034	82.652	0.000
Smooth	0.745	0.138	5.413	0.000

Based on table 2 and the significance level of the F statistic, it can be concluded that the regression model is significant at the 95 percent level. According to table 2, the adjusted R^2 of the model is 0.99 and it shows that the 99 percent level of the changes in the dependent variable is explained by this model. In table 3, it is clear that there is a significant relationship between income smoothing and liquidity risk. The sign of the coefficient of income smoothing indicates the positive association between this variable and liquidity risk. Based on the signs of the coefficients and the significance level, it is found that there is a positive significant relationship between β^S and β^H and liquidity risk. However, this relationship is found to be negative and significant for the liquidity risk and β^M and it is shown that the other control variables are not significantly associated with the liquidity risk.

Discussion and Conclusion

The present study tests the relationship between information risk and liquidity risk through income smoothing. Using three-factor model of Fama and French, the income smoothing measure has been measured by using the ratio of standard deviation of net income to the standard deviation of operating cash flows and liquidity risk.

The findings confirm the positive significant relationship between income smoothing measure and liquidity risk. It was also found that the decrease (increase) in the income smoothing reduces (increases) the estimate of the capital market of the liquidity risk. The results show that this hypothesis is consistent with the findings of Ng (2011) who found there is an inverse relationship between income smoothing and liquidity risk.

Consequently, it is found that the accounting information has been highly considered by the other users, shareholders or managers. Actually, this finding shows the significance level of the accounting information in the Tehran Stock Exchange.

Based on the positive significant relationship between income smoothing and liquidity risk, it is suggested that the quality of the accounting information plays a significant role in improving the capital market of Iran. In addition to the sensitivity of the capital market, the managers are offered to reduce earnings management and enhance the earnings quality.

The investors and other stakeholders of the stock exchanges are suggested to pay a special attention to the information risk factor (income smoothing).

The other findings confirm the positive significant association between the size factor and value factor with the liquidity risk; however, the conclusions show that the market factor and liquidity risk are negatively associated. Therefore, the decision makers and other

participants are suggested to consider these three factors of risk in making decisions about risk estimation.

The scholars are suggested to investigate the role of the other indexes in estimating the liquidity risk. These indexes include relevancy, reliability or persistency of the earnings. The stock exchanges are also offered to develop approaches for the purpose of improving and reinforcing the role of accounting information, transparency of the disclosed information and reducing the impact of other nonfinancial variables such as political issues so that the ethical risks are mitigated.

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