

# The Impact of Information Risk on the Systematic Risk

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### Abstract

Systematic risk is among the most significant topics and has been Longley considered by the researchers of the capital market. The final goal of the most investors, stakeholders and managers achieve the highest return. They confront risk and it is necessary to equilibrate the risk and return. Accordingly, it seems essential to investigate the risk and the related effective factors. This study seeks to find the effect of informative risk on the systematic one. Fifty two listed firms on Tehran Stock Exchange for a five year period including 2006-2010 were selected as the sample in order to test the hypotheses. Multivariate regression model has been also applied to analyze the required data. The findings reveal that there is a positive significant relationship between informative risk indicator (income smoothing) and systematic risk.  
**Keywords:** Informative risk, Income smoothing, Earnings quality, Systematic risk, Fama and French three-factor model.

JEL Classification: M41

### Introduction

The investors, managers and other users should access the qualified information. The financial statements are the final products of the accounting system and financial reporting and these statements aim at providing summarized and classified information about the financial position, financial performance and financial flexibility of the business that is useful for a wide range of users in making economic decisions. Based on the theoretical concepts of the financial

reporting, the useful information should have specific quality characteristics. The main qualified characteristics relate to the information content, relevancy and reliability (Bulu et al, 2011).

Reported earnings are one of the most important measures of decision making that has been considered by a wide range of the users including shareholders, investors and stock brokers. Calculating the economic income is impacted by the estimated accounting methods and the business managers hold the responsibility to prepare the financial statements. The managers might manipulate earnings for different reasons. On the other hand, the investors pay especial attention to the main factors of decision making (Ghorbani et al, 2010).

The investors might select different and various investment choices based on the characteristics of risk and return. The investment in the financial properties has been always accompanied by the risk and uncertainty and threatens the return and capital. Therefore, it seems necessary to consider risk in the investments. Clearly, the investors try to maximize their wealth through reducing cost of capital and investment risks. One of the risks that the investors are confronted with is the systematic risk. It seems essential to take into account the systematic risk and the effective factors.

The present study seeks to explain the relationship between information risk through income smoothing and systematic risk.

### **Theoretical Background**

The managers of the financially distressed firms tend to improve the bottom line of the income statement and change the information contained. Earnings management is a way to show the financial position of the firms in a satisfactory manner. However, the earnings might be manipulated and this would lead to the mitigation of the credit. The managers might intend to manipulate earnings to satisfy their personal needs and this is called opportunistic manipulation. On the other hand, this manipulation might be because of some other reasons. The available information about the security and future positions causes managers to select the accounting trends by which the personal information is transferred to the other users of accounting reports. This would mitigate the information asymmetry between the managers, shareholders and other stakeholders and would increase the value of the earnings in comparison with the other performance measurement metrics. The auditors are responsible for the attest function that limits the opportunistic behaviors of the managers (Mehrazin et al, 2010).

The fundamental basis to measure the relationship between risk and return has been developed in a framework called capital assets pricing model (CAPM). In this model, the investments are evaluated in a situation in which the earnings are expected to be earned in the future. In evaluating and capital budgeting of a plan, the firms should examine whether the expected return is obtained. This possibility in the decision making process is known as the risk level. On the other hand, risk is defined as the lower level of real return rather than the expected return. Systematic risk is an unavoidable risk and is not controllable. This risk would impact the whole securities and might be also termed market risk. The systematic risk includes the politic and economic risk (Vakili Fard, 2010).

By investigating the relationship between information risk (income smoothing) and systematic risk, the significance level of the accounting information in the capital market has been empirically tested. It is also intended to examine whether the accounting information has been

used by the investors and other stakeholders and whether it impacts the systematic risk. By confirming this relationship, it is concluded that the quality of the accounting information plays an essential role in improving the market performance and reducing the cost of capital and mitigating the related risk.

Beaver et al (1970) tested the relationship between systematic risk and the risk measures in accounting over a period from 1947-1956 and 1957-1965. The findings revealed that the risk measures related to the earnings include paying dividends, standard deviation of P/E ratio and accounting beta and are strongly associated with the systematic risk whether at the individual security level or at the portfolio level in both time periods.

Eskew (1979) compared the systematic risk predicted by the accounting variables and the systematic risk calculated by the market model. He recognized that the three variables of growth, size and earnings variability significantly correlate with the systematic risk.

Lara et al (2005) examined the impact of earnings management on the time asymmetry of the earnings. They found that the earnings management increases the earnings conservatism. However, increasing conservatism is because of the operating and business environment and consequently leads to the increases in the time asymmetry of the earnings.

Cornett et al (2008) found evidences representing that the institutional ownership increases the monitoring over firms and inhibits the aggressive application of accounting authorities. Their findings represented that ownership percentage of the institutional investors, the number of the institutional shareholders and the number of the board members appointed by the institutional investors significantly decreases the average discretionary accruals and earnings management.

Richie (2009) conducted a study about the income smoothing and cost of debts. Using TZ statistic, the income smoothers were segregated from the others and it was found that the firms with lower cost of debts and higher investment ranking are those with higher degrees of smoothing.

Pinghsun et al (2009) explored the potential impact of artificial smoothing and real smoothing on the firm value. Their findings revealed that the firm value decreases with higher artificial smoothing and increases by the higher real smoothing. They also argued that the agency costs are mitigated by the real smoothing.

Iatridis (2010) investigated the impact of International Financial Reporting Standards (IFRS) on the quality of the accounting figures. Furthermore, this study examined the relationship between financial statements based on IFRS and firm value. Their results indicated that implementing international accounting standards improves the quality of the accounting figures and reduces the authorities in the earnings management and this is because of the timely recognition of the losses. The present study suggests that the lower information asymmetry and lower manipulation of the earnings lead to higher quality of the financial information and better unbiased judgments.

Chang and Shiva (2010) evaluated the impact of earnings management on the predictive ability of the earnings. They concluded that earnings management reduces the predictive ability of the earnings. However, the findings about the impact of earnings management on the predictive ability of the different deciles of the earnings management revealed that the higher deciles represent the awareness behavior of the earnings management. Finally, they concluded that their findings do not support the opportunistic earnings management.

Namazi and Khajavi (2004) examined the usefulness of the accounting variables in predicting the systematic risks of the firms listed on the Tehran Stock Exchange. Their results showed that there is a significant association between twelve variables and the systematic risks at the simple regression level. In addition, it was shown that the eight remaining variables might explain more than 85 percent of the changes in the systematic risk.

Pour Heydari and Aflatouni (2006) examined the smoothing incentives of the firms listed on the Tehran Stock Exchange. They concluded that income smoothing by the discretionary accruals has been performed by the Iranian managers and the income tax and deviations from the operating functions are the main incentives for smoothing earnings by the discretionary accruals. Unlike the findings of the western scholars, the ratio of debts to the total assets and earnings volatility are not significant motivations for the income smoothing.

Saeidi and Ramesheh (2011) investigated the determinants of the systematic risk of 80 firms listed on the Tehran Stock Exchange. Employing the regression analysis, it was found that there is a significant association between beta and the growth of the operating income, changing the operating income and market portfolio index. In addition, the results found evidences about the relationship of the unstable beta of the firms with higher leverages.

Noravesh and Zakeri (2011) considered 50 firms listed on the Tehran Stock Exchange and studied the income smoothing through selling the assets. The results confirm the income smoothing so that the sale earnings smooths the temporary changes.

Sajjadi et al (2011) studied the relationship between institutional investors and earnings quality of the firms listed on the Tehran Stock Exchange. They concluded that the presence of the institutional investors improves the predictive ability, feedback value and fairness of the financial statements. Furthermore, the presence of these investors in the ownership structure would cause timely financial statements to be prepared. Finally, the results showed that there is no significant association between institutional investors and absolute value of the discretionary accruals.

Saghafi and Marfou (2011) examined the liquidity risk and earnings quality. Their conclusions revealed that there is a significant relationship between relevancy, reliability and smoothing of the accounting figures with the liquidity risk. In addition, the higher quality of the earnings reduces the quality of the liquidity risk and it can be then concluded that the disclosed quality of the earnings plays a role in mitigating the liquidity risk.

## **Methodology**

This study is a descriptive-correlation study because it examines the relationship between the variables. The findings of the study might be employed in the decision-making process and that is why this is classified as an applied study.

The required information is gathered from library studies and using the prior literature, journals, the related articles and the information on the financial statements of the Tehran listed firms. This study covers a period from 2002 to 2010 and the data about the information risk and the coefficients of the Fama and French is collected from 2002 to 2005. In addition, the relationship between the main variables has been examined over 2006 to 2010.

To analyze the findings of multivariate regression, Excel and SPSS software have been used. The significance level is determined at the 95 percent level. The following research questions are developed as follows:

There is a significant association between income smoothing and systematic risk.

### **Population and Sampling**

To select the listed firms on the Tehran Stock Exchange, filtering technique has been used. These firms should have the following characteristics:

- The end of the fiscal year should be consistent with the calendar year.
- The stocks of the firms should be traded on the Tehran Stock Exchange for at least 100 days in the year.
- The firms should not be classified as insurance, investment or financial intermediaries.
- The information related to the variables of the firms should be available.

Based on the above characteristics, 52 firms have been selected as the sample.

### **Research Variables**

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

#### **Independent variable**

Some scholars believe that income smoothing might maximize the managerial compensations, mislead the shareholders or maximize their bonus by manipulating earnings. The managers might intend to hide the changes in the economic performance by the changes in the accounting and financial reporting. From this perspective, income smoothing shows the low quality of the earnings. On the other hand, some believe that the managers use their secured information about the future earnings to smooth income and gain the normalized income. The current incomes are better indicators of future earnings and are of higher quality (Saghafi and Marfou, 2011).

Income smoothing is considered as the independent variable in this study. To compute the income smoothing (proxy for the information risk), the ratio of standard deviation of the net income (standardized based on the total assets of the prior period) to the standard deviation of the operating cash flows (standardized based on the total assets of the prior period) has been used:

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

NI: Net income before tax

OCF: Operating cash flow

#### **Dependent Variable**

Systematic risk is the dependent variable of this study defined as the coefficient of ( $\beta^M$ ) in the three factor model of Fama and French (1993):

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

r: Return

$r_f$ : Risk-free return rate

$\alpha$ : Intercept

$\beta^M, \beta^S, \beta^H$ : Coefficients of the market factor, size factor and value factor

MKT: Market factor

SMB: Size factor (stands for small minus big)

HML: Book-to-market value ratio (high minus low)

t: Time

$\epsilon$ : Residual

The first factor (MKT) is the market risk premium and is the beta of the model provided by CAPM which is called the market factor. The market risk premium is the difference between market return and risk-free rate of return. Market return is the total index of the end minus the total index of the beginning divided by the total beginning index. The index of the risk-free return is the interest rate on the governmental bonds.

The second factor is the difference between the average returns of the portfolios of small and large firms and is known as the size factor.

### Control Variables

The control variables of the study are as follows:

Size: This variable is calculated by the natural logarithm of the assets.

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

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

Cash ratio: The ratio of the cash and cash equivalent to the total current debts. In addition,  $\beta^S$  and  $\beta^H$  are considered as the control variables.

### Research Model

$$\beta_{it}^M = \psi_0 + \psi_1 \text{Informative Risk}_{it} + \psi_2 \beta_{it}^S + \psi_3 \beta_{it}^H + \psi_4 \text{Size}_{it} + \psi_5$$

$$\text{Book-to-Market}_{it} + \psi_6 \text{Capital Intensity}_{it} + \psi_7 \text{Cash Ratio}_{it} + \epsilon_{it}$$

In this model,  $\beta^M$  is the systematic risk of the stock  $i$  for the year  $t$ . The other variables have been defined in the previous sections.

### Data Analysis

#### Statistical Description of the Data

Table1. Descriptive Statistics

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

### Hypotheses Testing

There is a significant relationship between income smoothing and the systematic risk.

Table2. Regression Model

Change Source	Degree of freedom	Sum of squares	Mean of squares	F statistics	Sig. level	Adjusted R <sup>2</sup>
Regression	8	92586172	11573271	652.456	0.000	0.971
Residual	147	2607487.907	17738.013			
Total	155	95193660.38				

Table3. Regression Coefficients

Variable	Coefficient	Std. deviation	T statistics	Sig. level
Constant	183.888	205.410	0.895	0.372
Capital intensity	59.544	57.917	1.028	0.306
Cash ratio	12.386	113.414	0.109	0.913
size	-6.977	7.357	-0.948	0.345
Book-to-market	-1.076	29.324	-0.037	0.971
$\beta^S$	23.311	5.271	4.422	0.000
$\beta^H$	120.939	16.257	7.439	0.000
Smooth	57.813	11.440	5.053	0.000

As shown in table 2, the significance level of F statistics is lower than 5 percent and it is concluded that the regression model is significant and there is a linear relationship between the independent and dependent variables. The adjusted R<sup>2</sup> of the model is 97 percent and it shows that 97 percent of the changes in the systematic risk are explained by this model. In addition, it is found that there is a significant association between income smoothing and systematic risk. The sign of the model confirms the positive relationship between these two variables. In other words, the systematic risk increases by increasing the income smoothing. Based on table 3 and the significance level, it is found that  $\beta^S$  and  $\beta^H$  are positively associated with the systematic risk. However, the other control variables have no significant relationships with the systematic risk.

### Conclusion and Suggestion

The present study examines the relationship between the information and systematic risk. Income smoothing has been measured by the standard deviation of the net income to the standard deviation of the operating cash flows and systematic risk by using Fama and French



three-factor model. This results in the positive significant relationship between income smoothing and systematic risk. That is, the lower income smoothing leads to lower systematic risk.

Based on the findings, it is concluded that the accounting information has been highly considered by the other users, shareholders and managers. In fact, this result shows the significance of the accounting information on the Tehran Stock Exchange.

The positive significant association between income smoothing and systematic risk confirms the significant role of accounting information quality in improving the position of the capital market of Iran. To reduce the risk and cost of capital, the managerial functions to manipulate earnings should be prevented.

Consequently, the investors are suggested to pay special attention to the information risk factor (income smoothing) when making and evaluating the risk.

Furthermore, the other findings of the study confirm the positive significant relationship between  $\beta^S$  and  $\beta^H$  with the systematic risk. The other stakeholders are offered to take into account these two factors in making their decisions for estimating risk.

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