Investigating the Relationship between Quality of Smoothed Profits and Non-systematic Risk in Tehran Stock Exchange Market

**Zahra Amirhosseini, Javad Mehrabi, Afsaneh Kalhor**

**ABSTRACT**

In this study, the relationship between non-systematic risk and quality of smoothed profits in Tehran Stock Exchange has been empirically tested. From a practical point of view, the study is a descriptive correlation research, and the research data were collected ex post. Firms listed on the Tehran Stock Exchange where the sample of our research. The study period is from 2008 to 2012. The model used to estimate is panel of data. The results indicate that there is no significant relationship between non-systematic risk and high quality smoothed profits at a confidence level of 95%. The model also shows the significant relationship between non-systematic risk and low quality smoothed profits at a confidence level of 95%.

**Key words:** Profit Quality, Profit Smoothing, Non-systematic Risk, Tehran Stock Exchange;

**Introduction**

Financial reports are considered as one of the most important products of accounting system whose major objective is to provide necessary data for the evaluation of performance, profit-making ability of companies and prediction of future cash flows. Net profit is one of the accounting items which is presented in the income statement. This item is calculated on an accrual basis and is influenced by accounting procedures selected by the manager. Investors are inclined to companies which take fewer risks and yield an adequate output. Since a company's market risk are measured by fluctuations of its stock and stock value is somehow related to each dividend, companies tend to reduce output fluctuations by reducing fluctuations in each dividend, and as a result influence investors and creditor's viewpoint of the company's risk. Therefore, companies smooth profits so that the flow of reported profit growth becomes constant. The present study endeavors to empirically examine the relationship between non-systematic risk and the quality of smoothed profits according to the comparative approach of high-quality profit companies and low-quality profit companies in the Tehran Stock Exchange Market.

**Statement of the Problem:**

Investors believe that low-quality profit is not desirable because it indicates a non-optimum allocation of resources. It is not efficient as it reduces economic growth through non-optimum allocation of resources. High-quality profit reduces capital costs by reducing data risk associated with the reduction of the cost of equity and increase of transactions. High-quality profit encourages investors to carry out investment. When investors ensure that companies enjoy a high-quality profit, they invest more on stocks and security [3].

There are several techniques to manage profits. One of them is smoothing the profit examined by numerous studies [17].

The present study focuses on profit smoothing as part of profit management for following reasons: first of all, profit smoothing companies can be easily identified from companies who do not deal with this. In addition, smoothing can be defined operationally.

Profit smoothing is conducted in various companies whose sail is dependent on inflation and boom cycles. For instance inflation and boom years are specified in the construction sector. Sail prices are kept short sale during the boom years but they are introduced as sail during inflation years [12]

Investors pay attention to profit quality and stock risk in investment and are always seeking high-quality profits [15]. The most important point in the present study is to investigate the kind of relationship between smooth profits and non-systematic risk. This study not only emphasizes smoothing and its effect.
on investors' behavior but also considers the profit quality. In other words, the objective of the study is to investigate the relationship between non-systematic risk and smoothed profits (high-quality and low-quality). Therefore, the main research question is:

Is there a significant relationship between non-systematic risk and smoothed profit?

**Literature Review:**

Previous studies have provided numerous definitions for profit management. For instance, a study done by Healy and Wahlen [8] defined profit management as managers' effort to mislead some beneficiaries about the company's performance or to misrepresent the outcome of contracts which influence managers' remuneration.

There are several techniques to manage profits such as profit smoothing. Fundenberg and Tirole [5] described profit smoothing as the process of manipulating revenues or costs to show the least variability in profit while no long term reduction of costs or increase in revenues has occurred.

Managers employ several methods such as some standards, delay in recording revenues, etc. to reduce company's revenues when they increase and vice versa. Consequently, those who assess their performance observe a stable company compared with managers who do not use the technique. However, the truth is otherwise. But nobody hears it, because eyes not only see but also listen instead of ears.

Tucker and Zaroin [17] expressed that when managers take advantage of their authority in financial reporting, they provide more information about cash flows and future profits. Their study provided the first empirical evidence to suggest that by profit smoothing, stock price provides more information about future profits. In another research carried out by Nagy and Neale [12], it was indicated that profit smoothing reduces the clarity of financial reporting. Furthermore, profit smoothing is considered as a barrier to the company's growth signals. Nevertheless, it creates mental security for investors. Albrecht and Richardson [1] claim that there are two types of profit smoothing: natural profit smoothing and intentional profit smoothing. Natural profit smoothing results from an income-generating process and produces a smooth stream of profit. That is, profit is not manipulated by managers. In another study done by Fundenberg and Tirole [5] it was stated that this kind of profit smoothing could not be considered as profit management for profit is not manipulated by managers. On the contrary, intentional profit smoothing is itself divided into two categories: real and artificial smoothing. Real smoothing occurs when management smoothes profits according to economic events. However, in artificial smoothing, profits are manipulated according to delay in accounting entries. Therefore, it can be interpreted that smoothing depends on manager's aim.

Previous studies concluded that low variability of revenues indicates low risk which leads to the reduction of stock value [10]. The results of other studies imply that institutional investors avoid companies whose revenue's variation is more than other companies'. They are not generally attracted to companies with inflated revenues [2]. We seek causes of differences in quality of revenues. Numerous studies used the concept of profit quality but neither of them provided an official definition. U.S. Securities and Exchange Commission on the accounting statement number 159 defined profit quality as income reports that assist investors in assessing resources and predicting continuous profits.

Beaver [3] concluded that profit management can either damage profit quality or increase it since profit smoothing is a kind of profit management which can either damage profit quality or increase it. The results of earlier studies indicate that profit smoothing companies sometimes have the highest outcome in comparison with non-smoothing companies [11].

Hajivand [6] investigated managers' motives to smooth profits and manipulate reported profit to find out whether smoothing and manipulating profits advocate managers' benefits or advocate the increase of shareholders' assets. The results indicate that the aim of manipulating profits is to increase managers' personal resources.

Nourani [14] examined the effect of profit smoothing on company output. He concluded that profit smoothing is present in Tehran Stock Exchange and it does not affect company output.

Noravesh [13] in a study named "investigating the effect of accrual items on profit quality in accepting companies in Tehran Stock Exchange Market" examined the relationship between the quality of accrual items and profit quality. The results indicate that as the quality of accrual item decreases (as a result the error of estimation of accrual items increases), stability of profit and consequently profit quality decrease.

**Research Hypotheses:**

In order to achieve the objectives of our study, research hypotheses are formulated according to the findings of previous studies and theoretical framework:

H1: There is a significant relationship between high quality smoothed profits and the company's non-systematic risk.

H2: There is a significant relationship between low quality smoothed profits and the company's non-systematic risks.
Methodology:

From the objective point of view present study is an applied research. It is a correlation-based descriptive research. The required data were collected ex post because past data of sample companies were used. They were obtained from library of Securities and Exchange Organization, financial reports of the stock exchange and "Tadbirpardaz" accounting software.

All accepted organizations in Tehran Stock Exchange Market from 1386 to 1390 (2007-2011) include the population of this research. Organizations which meet the following requirements were selected for research sample:

1. The fiscal year of all companies ends at Esfand, 29.
2. All companies must be active from 1386 to 1390.
3. Companies have not changed their fiscal year from 1386 to 1390.
4. The required data of companies must be available.
5. Investing and banking companies are not included.

Therefore, 88 companies were studied as research sample. Sample companies are divided into two categories. The first category includes profit smoothing companies with high quality profit, and the second one is profit smoothing companies with low quality profit.

Research variables were calculated by Excel software and then analyzed by Eviews software.

Variables in Research Model:

The dependent variable is non-systematic risk that is a risk caused by company's specific features such as type of product, capital structure of the main shareholders, etc. According to Portfolio theory, non-systematic risk can be reduced by diversification of the stock portfolio. In this study, non-systematic risk was calculated by the standard deviation of shares:

$$\sigma = \sqrt{\frac{1}{n} \sum_{i=1}^{n} (R - \bar{R})^2}$$

Where R is the company's stock return which is calculated as follows:

$$R = \frac{P_t - P_0}{P_0}$$

The independent variable is the index of smooth profit quality which is used to distinguish smoothing and non-smoothing companies from Eckel index. Imhoff [9] was the first person who stated that when profit variability is lower than revenue variability, smoothing takes place. In Eckel's model, a company smoothes profit whose ratio of profit change to sail change index is less than 1:

$$\frac{CV_{\Delta 1}}{CV_{\Delta S}} < 1$$

CV_{\Delta 1}: net profit change index
CV_{\Delta S}: net sail change index

In addition, Biever criteria [3] were used to distinguish high quality profit companies from low quality profit companies. Biever employed three criteria to determine profit quality:

1. Each dividend must be positive.
2. Operational cash flow must be positive.
3. The ratio of each dividend of operational cash flow of each share must be more than the mean of this ratio in the sample.

If a company has the above mentioned features, it possesses high quality profit. But if a company lacks even one of them, it will be a low profit one.

Debt ratio (to company assets) and company size (total sum of company assets logarithms) was considered as control variables. Finally, main model for testing research hypotheses was formulated as follows:

$$\sigma^2 = \beta_0 + \beta_1(\text{sh\_h\_q}) + \beta_2(\text{sh\_h\_biq}) + \beta_3(\text{size}) + \beta_4(\det\alpha) + \epsilon$$

$$\beta_0$$: non-systematic risk
(\text{sh\_h\_q}): index of smoothing and high quality companies
(\text{sh\_h\_biq}): index of smoothing and low quality companies
(\text{Size}): total sum of company assets logarithm
(\det\alpha): debt ratio
\epsilon: model's error (residual sentence)

Testing Hypotheses and Research Findings:

Pearson's Correlation Coefficient Results:

As shown in table1, the correlation coefficient between non-systematic risk variable and high quality smoothing companies variable is -0.057 (p-value: 0.23). Since p-value is more than 0.05, we can state with 0.95 confidence that there is no significant relationship between two variables. The correlation coefficient between non-systematic risk and the low quality smoothing company is 0.33 (p-value: 0.00) which indicates the significant direct relationship between variables at 95% confidence level. The correlation coefficient between non-systematic risk and company size is -0.28 (p-value: 0.54) which shows that there is no significant relationship at 95% confidence level. The correlation coefficient between non-systematic risk and debt ratio is -0.098 (p-value: 0.039) which indicates negative significant relationship between variables at 95% confidence level. Therefore, it can be generally stated that the significance level of high quality smoothing
companies’ index is a P-value: .23 which indicates that there is no significant relationship between non-systematic risk and high quality smoothing profits. Since significance level of low quality smoothing companies’ index equals to P-value: 0.00, it can be concluded that there is a significant relationship between non-systematic risk and smoothing low quality profits. The correlation coefficient is 33%.

### Table 1: Correlation coefficient matrix between explanatory variables and dependent variable

<table>
<thead>
<tr>
<th>Debt ratio</th>
<th>Company size</th>
<th>Low quality smoothing companies’ index</th>
<th>High quality smoothing companies’ index</th>
<th>Non-systematic risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-systematic risk</td>
<td>1.000000</td>
<td>--------------------------------------</td>
<td>--------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>High quality smoothing companies’ index</td>
<td>-0.057130</td>
<td>1.000000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low quality smoothing companies’ index</td>
<td>0.332854</td>
<td>-0.000236</td>
<td>1.000000</td>
<td></td>
</tr>
<tr>
<td>Company size</td>
<td>-0.028962</td>
<td>-0.137754</td>
<td>-0.062384</td>
<td>1.000000</td>
</tr>
<tr>
<td>Debt ratio</td>
<td>-0.098085</td>
<td>0.034447</td>
<td>0.112125</td>
<td>-0.020789</td>
</tr>
<tr>
<td></td>
<td>0.0397</td>
<td>0.4711</td>
<td>0.0186</td>
<td>0.6636</td>
</tr>
</tbody>
</table>

Related tests to research model:

**Chow test:**

The model must be examined in panel data of Chow test before estimation. According to test results and related probability shown in table 2, it can be concluded that the effect of this model is not constant in periods, and as the model is a combined one, Hussmann test is not required.

**Normality of residual sentences test:**

Values of Jarquebera test (3, 8) and related probability (0, 14) prove the normality of residual sentences in the model.

**Zero means assumption test of residual sentences:**

Since the model has a constant value in panel models, the assumption of zero meaning of residual sentences cannot be rejected. Table 3 illustrates that zero mean assumption of residual sentences is confirmed.

### Table 2: Chow test

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>df</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fischer</td>
<td>0.597732</td>
<td>(87, 348)</td>
<td>0.9977</td>
</tr>
<tr>
<td>Chi-square</td>
<td>61.278258</td>
<td>87</td>
<td>0.9835</td>
</tr>
</tbody>
</table>

### Table 3: Test of zero meansthe assumption of residual sentences

<table>
<thead>
<tr>
<th>The sample mean</th>
<th>SD of model</th>
<th>Value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-student test</td>
<td>3.29E-17</td>
<td>1.0000</td>
<td></td>
</tr>
</tbody>
</table>

**Combined Estimation of Model:**

Least Ordinary Squares (LOS) method was employed as panel data to estimate the main model of the research. Research regression in testing hypotheses is as follows:

\[
\sigma^2 = \beta_0 + \beta_1 (sh _h _q) + \beta_2 (sh _h _biq) + \beta_3 (size) + \varepsilon
\]

The results of model estimation are given as:

\[
\sigma^2 = 1.17 + 0.41 (sh_hbiq) - 0.26 (det a) + \varepsilon
\]

\[
R^2 = 0.13 \quad D.W = 2.75 \quad F-statistic = 16.59
\]

Other features of the model are presented in table 4.
Prediction level of non-systematic risk according to model is shown in figure 1.

![Risk estimation diagram with model](image)

**Fig. 1:** Risk estimation diagram with model

The results of estimating the model and tests indicate that:
1. F statistic of the model is high (16.59) which show the significance of all regression models.
2. t statistic and its p-value (0.00) indicate the significance of low quality smoothing independent variable at 95% confidence level.
3. t statistic and its p-value (0.22) denote non-significance of high quality smoothing independent variable at 95% confidence level.

R2 statistic suggests that a 13% change of the dependent variable can be explained by explanatory variable.

*Conclusion and Suggestions:*

The obtained results of every research are important because they can provide the basis for solving problems or improving existing condition. Summary and conclusion are presented in this section. Therefore, research objectives, research procedures and results are presented. Research limitations are then presented, and finally some suggestions for further research are given.

*Research Summary:*

Shareholders rely on a company's financial statement particularly reported profit to determine the output rate. Therefore, the quality of reported profit influences the estimation of shareholders' expected output and a company's non-systematic risk. The present study endeavors to investigate empirically the relationship between non-systematic risk and profit quality according to a comparative approach to high quality and low quality profit companies in the Tehran Stock Exchange Market. The main point in the present study is to find out the kind of relationship between profit smoothing and the quality of reported revenues along with non-systematic risk.

Profit quality is defined as the relationship between profit-making and the ability to create cash flows. Evaluating profit quality and its relationship with elements of capital structure assist the users of financial statements to judge certainty of current profits and predict future profits. The most important concepts in investment decisions are risk and output. Output is itself influenced by various factors such as the quality of smoothed profits. However, the relationship between the quality of smoothed profits and non-systematic risks of financial assets is not similar in different markets. Therefore, investigating the relationship between the quality of smoothed profits and non-systematic risk of financial assets is of considerable importance. The present study investigates the relationship between the quality of

---

**Table 4: Regression coefficients**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>SD</th>
<th>Test</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoothing index</td>
<td>-0.165912</td>
<td>0.136547</td>
<td>-1.215049</td>
<td>0.2250</td>
</tr>
<tr>
<td>Smoothing and Low quality index</td>
<td>0.417880</td>
<td>0.054238</td>
<td>7.704563</td>
<td>0.0000</td>
</tr>
<tr>
<td>Company size</td>
<td>-0.0005484</td>
<td>0.014010</td>
<td>-0.391458</td>
<td>0.6957</td>
</tr>
<tr>
<td>Debt ratio</td>
<td>-0.267429</td>
<td>0.088782</td>
<td>-3.012179</td>
<td>0.0027</td>
</tr>
<tr>
<td>Constant</td>
<td>1.176080</td>
<td>0.200007</td>
<td>5.880202</td>
<td>0.0000</td>
</tr>
<tr>
<td>R2</td>
<td>0.132407</td>
<td>Fischer test</td>
<td>16.59678</td>
<td></td>
</tr>
<tr>
<td>Adjusted R2</td>
<td>0.124429</td>
<td>Durbin-Watson statistic</td>
<td>2.754195</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>0.432557</td>
<td>Sig.</td>
<td>0.000000</td>
<td></td>
</tr>
</tbody>
</table>
smoothed profits and non-systematic risk in Iran for the very first time. Therefore, it is a new topic which can open up new horizons for investigators to carry out research in the area of profit management according to the quality of reported revenues and non-systematic risks.

The ideal objective of this study is to create a new approach and perspective on the relationship between quality of smoothed profits and non-systematic risks in Tehran Stock Exchange companies. The general objectives of research are:

1. To explain the relationship between a company's non-systematic risk and high quality profit companies in Tehran Stock Exchange.
2. To explain the relationship between a company's non-systematic risk and low quality profit companies in Tehran Stock Exchange.

This study is an applied one which emphasized correlation-based and analytic relationships. In a categorization relatively acknowledged by professional researchers, research methods are divided into experimental and descriptive research. Since the required data are gathered without manipulation, the study is a correlation-based descriptive research.

The required data were gathered from available documents of library of Securities and Exchange Organization such as financial statements and audit reports of companies, comprehensive data bank of companies in internet website of Tehran Securities and Exchange, "Tadbir Pardaz" and "Rah Avard Novin" softwares.

**Results of Hypotheses Testing:**

H1: there is a significant relationship between high quality smoothed profits and the company's non-systematic risk.

The results indicate that the relationship is not significant at 95% confidence level. In other words, there is no relationship between high quality smoothed profits and the company's non-systematic risk.

H2: There is a significant relationship between low quality smoothed profits and the company's non-systematic risk. The results indicate the existence of a significant relationship between variables at 95% confidence level. In other words, the second hypothesis cannot be rejected at the 95% confidence level.

**General Conclusion:**

The summary of the results of research hypotheses is illustrated in table5.

<table>
<thead>
<tr>
<th>Secondary hypothesis</th>
<th>Hypothesis</th>
<th>Sig.</th>
<th>Rejected/proved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>There is a significant relationship between non-systematic risk and high quality smoothed profit</td>
<td>0.2250</td>
<td>Rejected</td>
</tr>
<tr>
<td>2</td>
<td>There is a significant relationship between non-systematic risk and high quality smoothed profit</td>
<td>0.0000</td>
<td>Proved</td>
</tr>
</tbody>
</table>

**Limitations of Research:**

Nothing can be proved definitively in empirical science. In fact, the theories are neither provable nor rejectable not unlikely. Two limitations of the present study are:

1. Inefficiency of Iran capital market can influence the results of research.
2. Differences in the type of industry and ownership can impair internal validity.

**Suggestions of Research:**

**Suggestions Based on Research Results:**

It is recommended that investors in Tehran Stock Exchange avoid investment in companies with low quality smoothing profits because it involves taking considerable risk. They are required to pay attention to profit smoothing since it reduces the risk. It is suggested that managers of companies in Tehran Stock Exchange smooth their profits in order to reduce their stroke risk, but be aware not to reduce company value consequently.

**Suggestions for further research:**

Every research paves the way for new research areas, and increases the necessity of doing further research. This study provides some suggestions for research in following areas:

1. In order to obtain more comprehensive results, it is suggested to carry out the same research in the future taking into account wider time span because it increases observations and validity of research. In addition, a research which includes companies outside Stock Exchange Market with reliable information sources can be of considerable assistance in generalizing results to economic society of Iran.
2. Investigate models used by investors in the Tehran Stock Exchange Market to determine risk.
3. Investigate the relationship between profit quality and financial bankruptcy of companies.
4. Investigate the relationship between investment opportunities and company's financial risk.
References