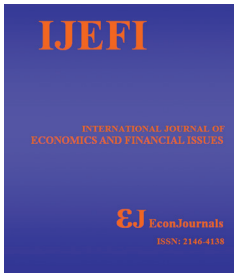

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The Effect of Audit Quality on Stock Crash Risk in Tehran Stock Exchange

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ABSTRACT

This paper aims to examine the impact of audit quality on stock crash risk in Tehran Stock Exchange. Down-to-up volatility (*DUVOL*) and whether or not experience crash month (*CRASH*) have been used as two criteria to measure stock crash risk. In addition, auditor industry specialization has been considered as an indicator of audit quality. The hypotheses are tested by using data from 74 firms listed in the Tehran stock exchange from the year 2003-2013, multivariate linear regression, and logistic regression method. The results indicate that there is a negative and significant relationship between audit quality and *DUVOL*. On the other hand, there is an insignificant negative relationship between audit quality and crash. Recent scandals in Iran show that the audit quality level in Iran is very low. On the other side, the Stock Exchange does not have a long history and stock market is not efficient either. As such, the stock crash risk is significant for current and potential investors. However, stock crash risk has not been examined in Iran as it should be. So this article tries to cover this phenomenon.

Keywords: Audit Quality, Stock Crash Risk, Down-to-up Volatility, Whether or Not Experience Crash Month, Auditor Expertise
JEL Classifications: M41, M42

1. INTRODUCTION

The economics of imperfect information is a branch of economics that has attracted attention of many scholars of this science. As Scott (2007) says, this branch "formally recognizes that some individuals have an information advantage over others. This led to the development of the theory of agency, which has greatly increased our understanding of the legitimate interests of business management in financial reporting and standard setting." This information asymmetry leads to the conflict of interest between business management and foreign investors, inaccurate evaluation of expected risk and returns of stock and finally wrong stock selection by investors.

This evaluation is heavily based on financial statements. They are important collections of financial information that the shareholders and investors need for decision-making. However, the conflict of interest with respect to agency problem and asymmetry of information, challenges reliability of financial statements information. Existence of such conditions leads to demand for independent auditors services. With growing competition in auditing profession, audit firms concern about how to provide services with best quality Hassas Yeghaneh, 2010.

The quality is important from another aspect. Despite systematic risks of stocks, the risk of severe losses due to fall in stock prices does not decrease through diversification of portfolio. The only way to prevent such risks is to identify firms whose shares are exposed to the risk of falling stock prices (Sunder, 2010). One way to prevent such damage is giving importance to quality of audit carried out on firms' financial statements.

It is expected that, to some extent, the higher quality of audit restricts manipulation of accounting figures by managers and leads to explore questionable accounting practices. Furthermore, the higher quality of audit reduce the chances of management to achieve anticipated profit and accumulate bad news and information on the firm, as such, risk of stock price fall declines in market (Balsam et al, 2003).

The quality of audit has direct relation with the quality of audit firm. Actually, high quality audit firm has expertise, resources and incentives for detecting errors and fraud (Piot, 2005). In addition, professionalism of auditors increases expectation of audit quality.

In general, theoretically it is expected that more accurate audit and investigation of financial statements of firms will prevent opportunistic motivation and ability of management to show unrealistic performance of firm, accumulate bad news in firm and ultimately leads to reduction of crash risk.

This study empirically examines whether audit quality could decrease risk of falling stock prices or not.

In this way, this paper first explains theoretical background, namely definitions, theories and studies about audit quality and risk of stock price falling, reviews relationship between two issues, and hypothesis. Then, research methodology, encompassing data and research design, will be studied. Furthermore, testing results will be explained. Finally, conclusions, recommendations and limitations will be presented.

2. THEORETICAL BACKGROUND

2.1. Conceptual Framework

DeAngelo, (1981) defined the quality of audit services as "the market-assessed joint probability that a given auditor will both (a) discover a breach in the client's accounting system, and (b) report the breach." This definition is based on the assumption that understanding of users from audit quality (market perception) indicates true quality of auditing. "The probability that a given auditor will discover a breach depends on the auditor's technological capabilities, the audit procedures employed on a given audit, the extent of sampling, etc." After De Angelo, other researchers like (Titman and Trueman, 1986); (Palmrose, 1988); (Lam and Chang, 1994) presented other definition for audit quality. As some, audit quality can be defined as perception of beneficiaries from discovering and reporting of misstatements in financial statements by auditor which depends on competence and independent of him/her.

As audit quality evaluation costs are likely to be significant, consumers develop surrogates for audit quality, i.e., to rely on some other (less costly to observe) variable which is (imperfectly) correlated with quality (DeAngelo, 1981). He argued that auditor size serves as a surrogate for audit quality. He concludes that larger audit firms have less incentive to behave opportunistically and therefore users' understanding of audit quality put them in a better position.

In addition to the auditor size, Auditor Industry Specialization is another proxy. Actually, having multiple clients in an industry and auditor expertise in that industry will influence the quality of audit. Audit institutions that have various clients in specific industry will better understand business and operational risks of it. Conversely, audit institutions without various clients cannot have good understanding of inherent risks in the industry. Researchers conclude that if auditors focus their activities on special industries, they provide higher quality of audit (Yaghoobnezhad and Amiri, 2009). According to Craswell et al. (1995), auditors who specialize in certain auditing industries always demand higher fees due to higher-quality services. Auditors of special Industries have stronger motivation to maintain their reputation in the industry. Chen et al., (2012) showed that high audit quality conducted by Auditors of special Industries, has significant and positive correlation with timely and useful financial information. Jubb et al.(2004) in order to measure the quality of auditing, in addition to the size of audit firm, used audit firms' industry specialization. They believed that audit institutions that have expertise in industry, perform a higher quality audit.

As result, auditor industry specialization includes the creation of constructive ideas to help clients (added value creation) and also providing new solutions for some issues that clients face in their respective industries (Kend, 2008). Since different aspects of auditor industry specialization are not directly observable, previous studies used various indicators for auditor industry specialization. Market share and portfolio share approaches are often used as an indicators for auditor industry specialization.

Stock price crash is a phenomenon in which stock prices have severe, sudden and negative adjustment. In other words, it is sudden and negative revise in expectations of investors about firm's shares. All studies that have been conducted in the context of stock prices crash discovered two main reasons, namely management activities and accounting systems, which boost them.

First, management tries to misled investors by deferent methods. By using earnings management, he tries to show earnings higher than the actual amount, which leads to investor optimism about the permanent income of firms, and ultimately to an increase in the firm's share price than the actual amount. This result in price bubble phenomenon. Another action is to illogically raise or hide bad news. This continues until managers are unable to prevent bad news from broadcasting. At this time, stock price crashes dramatically. Second, accounting systems have a crucial rule in the management of these actions (Kim and Zhang, 2015).

The phenomenon of stock price crash in recent years due to occurrence of certain events has become an increasingly important issue among financial and accounting researchers. The most important ones of these events includes the bankruptcy of large firms like WorldCom, The phenomenon of stock price crash in recent years due to occurrence of certain events has become an increasingly important issue among financial and accounting researchers. The most important ones of these events includes the bankruptcy of large firms like WorldCom, Enron and the crash of their stock prices, and the fall of US exchanges in October 1987 or the economic crisis in 2008, which led to market downturn in most of the world's capital stock.

Therefore, professional associations of accounting have always considered this phenomenon. The main purpose of the accounting system is reliable and relevant data transmission for decision making. That is the main information need of decision makers in relation to correct investment decision. Finding financial reporting

features that improve investorsred this phenomenonnomic crisis in 2008, which led to market downturn in most of the worldimportant ones of these counting standards authorities. On the other hand, in the majority of studies regarding stock price collapse, accounting was always a tool in the hands of management. This has caused accounting professional associations seek to find field of management manipulation and control solutions in this area (Lotfi, 2011).

Other researches about audit quality and stock crash risk will be discussed in the next section.

In general, it is theoretically expected that high audit quality prevent opportunistic motivation and the ability of management to show unrealistic performance of the firm, accumulate bad news on the firm and ultimately the audit leads to the reduction of crash risk.

2.2. Literature Review

There are many researches in audit quality and auditors industry specialization area.

Balsam, et al. (2003) compared discretionary accruals and earnings response coefficients of firms that engage industry specialist auditors with other firms. They concluded that firms of industry specialist auditors have lower discretionary accruals and higher earnings response coefficients than clients of non-specialist auditors. So, firms of industry specialists have higher earnings quality than firms of non-specialists.

Myers, et al. (2003) showed that longer auditor tenure leads to increase in auditor recognition and specialization from an industry. As such, earnings quality and persistence will increase.

Krishnan (2003 Supplement) reviewed the relationship between auditor industry specialization and absolute value of discretionary accruals of clients. He found that non-specialist auditor's clients report their absolute value of accruals discretionary higher than absolute value of discretionary accruals of expert auditor's clients. On average, the deference is 5% of total assets.

Francis (2004) examined the relationship between earnings quality and auditor's industry leadership. In this study, quality of earnings is defined as abnormal accruals and the chance to meet and achieve the predictions made by analysts on earnings management. If there is larger abnormal accruals, earnings quality is considered low; or if firm tend to manipulate reported earnings in order to meet the objectives of their anticipated profit, earnings quality is still considered low. They conclude that when the auditors are special industry leaders, earnings quality is higher.

Dunn, et al. (2000) stated auditor expertise in an industry that is demonstrated by the auditor share of audit works in an industry, has great impact on quality of client disclosure.

Sirois and Simunic (2011) studied the relationship among audit quality and auditor size and audit industry. These researchers used a model to predict how specific characteristics of market or size of market and investor protection system affect audit industry structure and there is difference between quality and audit fees of Big Four audit firms and others. In this model, technology plays an important role in determining quality of auditing and audit fees. As Big Four auditors, by fixed investments in IT audit compete with each other both in quality and in price. Their empirical analysis concept has political implications and provides insight as to how audit firms compete and how the audit industry evolves. In addition, it shows that despite high levels of market concentration, there should be competitive and innovative market for audit services.

In addition to the above research in audit quality area, other scholars examine factors that influence stock price crash.

Hutton, et al. (2009), in a study, evaluated relationship between lack of transparency of financial reporting and risk of falling stock prices. They used earnings management as a measure for lack of transparency of financial information and concluded that lack of transparency is associated with less information disclosure. In addition, firms with non-transparent financial statements are more at risk of stock price collapse.

Callen and Fang (2011) determined whether auditor's period of relationship with the customer, e.g., auditor tenure, has been associated with the falling of stock prices in the future. By using a large sample of US listed firms from 1980 to 2008, they obtained strong evidence that auditor tenure is negatively associated with stock price crash in the future. This evidence is consistent with supervision by the prospect of learning. In other words, the development of customer-specific knowledge through communication between auditors and clients along with capable auditors to detect and prevent hiding bad news by clients. As such, the chance of stock price crash will be decreased. Additional analysis shows that this negative association is lighter for firms audited by industry specialist auditors and Sarbanes-Oxley compliance.

Hamm, et al. (2014) reviewed the effect of earnings management on stock crash risk. Research results show that there is positive relationship between non-transparency of earnings and stock price crash risk, and stranger than (Hutton, et al. 2009) when it is in line with repeated earning management. Results indicate that issues of representative theory in earnings management guidelines, leads to selfish managers opportunistically use of misleading investors' understanding of guidelines.

Foroghi and Mirzaee (2012), in a research, examined relationship between conditional conservatism in financial reporting and risk of future stock price falling. The findings show that there is negative relationship between conditional conservatism and risk of future stock price falling. The results of this study suggest that when there is an information asymmetry between managers and investors, the ability of conditional conservatism to reduce future stock price falling risk is higher.

In continues to the above researches, this study review the effect of audit quality on crash risk in the Tehran Stock Exchange.

2.3. Hypotheses

In order to achieve aim of the study and according to theoretical background of research, hypotheses are designed as follows:

H1: There is significant relationship between audit quality and a down-to-up volatility (*DUVOL*) as proxy of stocks falling risk.

H2: There is significant relationship between audit quality and crash as proxy of stocks falling risk.

3. RESEARCH METHODOLOGY

3.1. The Data

The sample encompasses Tehran Stock Exchange firm-year observation from 2003 to 2013. The data are obtained from Tadbirpardaz[1] and the Tehran Stock Exchange official website database.

In order to clean data and have robust sample, some restrictions have been considered:

1. For each year, the financial period must be annual and end at a common fiscal year in Iran.
2. The fiscal year of each firm has not changed during the study period; as such, the results of financial performance are comparable.
3. Financial institutions and financial service firms were excluded from the population prior to the sample selection because these institutions differ in terms of the nature of the activities and their main income is from investments and related activities of other firms.
4. The required data is available during the study period.
5. During the fiscal year, do not have more than 6 months of trading halt, because the halt in trading would cause the inability to estimate the market value.

After above process, overall, 74 companies were selected.

3.2. Research Design

The hypotheses have been examined by following models:

$$DUVOL_{j,t} = \beta_0 + \beta_1 auditquality_{j,t} + \beta_2 size_{j,t} + \beta_3 mtb_{j,t} + \beta_4 lev_{j,t} \quad (1)$$

$$CRASH_{j,t} = \beta_0 + \beta_1 auditquality_{j,t} + \beta_2 size_{j,t} + \beta_3 mtb_{j,t} + \beta_4 lev_{j,t} \quad (2)$$

The research variables are as fallow:

3.2.1. Independent variable

The independent variable of this study is audit quality. To measure this variable, auditor's expertise has been used. Similar to Habib and Behyoyan study (2011) if total sales of all clients of a special auditor in a particular industry divided by the total sales of all clients in that industry be more than 30% (industry experts index), number 1 is adopted and otherwise the option is zero.

1 There is some financial analysis software in Iran that uses as database for data gathering. Tadbirpardaz and Rahavardnovin are two famous ones.

3.2.2. Dependent variables

The dependent variable of this study is risk of stock collapse. This paper computes two firm-specific measures of risk of falling stock prices for each firm-year observation. (1) The *DUVOL* of firm-specific daily returns (*DUVOL*); (2) crash.

Before measuring the above variables, "firm-specific monthly return" should be computed as fallow (Hutton, et al. 2009); (Bradshaw et al., 2010); (Kim and Zhang, 2015); (Callen and Fang, 2011); (Andreou et al., 2013); (Andreou, 2012):

$$W_{j,t} = \text{Ln}\,(1 + \varepsilon_{j,t}) \quad (3)$$

In this equation:

$W_{j,}$: Firm-Specific monthly Return in *j* month *t* during fiscal year; where the residual is $\varepsilon_{j,}t$ from:

$$r_{j,t} = \alpha_j + \beta_{1,jrm,t-1} + \beta_{2,jri,t-1} + \beta_{3,jrm,t} + \beta_{4,jri,t} + \beta_{5,jrm,t} + 1 + \beta_{6,jri,t+1} + \varepsilon_{j,t}$$

Where:
$r_{j,t}$: Stock return of *j* firm in month *t* during fiscal year;
$r_{m,t}$: Market return in month *t*.

To calculate monthly returns of market, beginning of month index has been deducted from end of month index and the result is divided on beginning of month index.

After calculation of "Firm-Specific monthly Return," first, following Chen et al. (2001) the down-to-up volatility DUVOL is calculated as follows. For each firm *j* over a fiscal year *t*, this paper separates all the months with firm specific returns below the annual mean and refer to them as "down months" from those firms' specific monthly returns, which are above the mean, called them the "up months." This paper then computes the standard deviation (SD) for the two predefined subsamples. *DUVOL* is the log of the ratio of the SD of the two subsamples, the one for the "down months" over the SD of the "up months" (Andreou et al., 2013) (Andreou et al., 2013). Then the equation is:

$$DUVOL_{j,t} = -Log\left(\frac{(n_u - 1)\sum_{DOWN} W_{j,t}^2}{(n_d - 1)\sum_{UP} W_{j,t}^2}\right) \quad (4)$$

Second, an indicator variable (*CRASH*) is defined that equals one when a firm experiences at least one crash month during the fiscal year, and zero otherwise. A crash month is when a firm experiences firm-specific monthly returns 3.2 SD (3.2 is chosen to generate a frequency of 0.1% in the normal distribution) below the mean firm-specific monthly returns for the entire fiscal year.

3.2.3. Control variables

Debt structure or financial leverage (Lev): That is measured as ratio of total debt to total book value of assets. Financially distressed firms are more likely to be sued, and the likelihood of financial distress is increasing in leverage, suggesting a higher litigation demand for conservatism from more levered firms (Khan and

Watts, 2009. p. 10), which can increase likelihood of stock price falling (Hutton, et al. 2009); (Kim and Zhang, 2015).

Firm size: Different groups of investors, regulators, and even politicians consider larger firms, due to their specific circumstances. This causes various supervisory authorities to examine the quality of information disclosed by these firms. Thus, large firms and non-disclosure of bad news is unlikely to accumulate. This is bad news for market to prevent entry of a sudden mass and thus reduces the risk of stock price falling (Kim and Zhang, 2015). To measure size, natural logarithm of market value of firm's stock has been used (Hutton, et al. 2009).

Ratio of market value to book value of equity (mtb): It is expected that firms with higher ratio of market value to book value be more volatile; on the other hand, firms that have more volatile stock returns, it is more likely that experience large losses. This increases possibility of lawsuits against the firm (Khan and Watts, 2009. p. 8). In addition, these can increase likelihood of stock price falling (Kim and Zhang, 2010. p. 9-12).

4. RESULTS

In order to perform an initial analysis of data, descriptive statistics of quantitative variables are presented in Table 1. The table shows mean, maximum, minimum, and SD of observations.

H1: Evaluating relationship between audit quality and a *DUVOL* as proxy of stocks falling risk.

Table 2 presents a summary of the first model. F statistics for all companies, which is equal to 11/761, indicates that model is significant at 95 percent level. Moreover, according to Durbin–Watson statistics for all companies which is equal to 1/515, the residuals are not serially correlated. Adjusted R^2= 0/055. Thus, it can be concluded that 5.5% of the changes of dependent variable predicted with independent and control variables.

According to the results, there is a significant and negative relationship between audit quality and *DUVOL* of stock crash risk. In addition, the results represent a significant and negative relationship between size and stock crash risk and positive relationship between financial leverage and stock crash risk; however, relationship between ratios of market value to book value of equity and stock crash risk is not statistically significant.

H_2: Evaluating relationship between audit quality and crash as proxy of stocks falling risk.

Table 3 presents a summary of first model. As table shows, significant level of Hasmer and Lemsu statistics indicate a good match with actual observations of model, respectively. Index value of Cox and Snell R^2 and Nagelkerke R^2 in model is 1.1% and 5.4% respectively, which indicates inappropriate predictive power of model.

According to the result of the Wald and significance level, it is observed that despite negative relationship between audit quality and crash, this relationship is not significant. In addition, among control variables, only size have significant negative relationship with crash. Finally, the relationship between financial leverage ratio and ratio of market value to book value of equity and stock crash is not significant.

Table 1: Descriptive statistic

Variables	Minimum	Maximum	Mean	SD
Audit Q	0	1	0.43	0.496
CRASH	0	1	0.03	0.181
DUVOL	−0.932130	6.149794	2.35851319	1.121337165
SIZ	22.850000	31.020000	26.55615609	1.553731660
MTB	0.000000	1185.600000	15.21560212	66.912992976
LEV	0.120000	1.360000	0.69234154	0.153794259

SD: Standard deviation

Table 2: First model summery

Variables	Coefficient (β)	t-value
Intercept	4.083	5.441*
AQ	−0.212	−2.598*
SIZ	−0.093	−3.497*
MTB	0.000	−0.582
LEV	1.207	4.574*
F-value	11.761*	
Adjusted R^2	0.055	
Durbin–Watson	1.515	

*Significant at 0.05

Table 3: Summery of second model

Variables	Coefficient (β)	Wald
Intercept	4.127	1.022
AQ	−0.063	0.023
SIZ	−0.323	4.838*
MTB	−0.016	1.045
LEV	1.635	1.406
Omnibus tests	8.555*	
Nagelkerke R^2	0.045	

*Significant at 0.05

5. CONCLUSION

In client and agent relationships, one of the most important issues is the information that management must present to stakeholders. However, management usually tries to hide bad news. This action cannot be continued forever and at one point, management is forced to release this information. As result, the stock price will collapse. Auditing is an obstacle in the way of information disclosure avoidance (regardless of being negative or positive). Unfortunately, there is negative sign of audit quality in Iran about which the most famous ones are recent scandals. On the other side, Stock Exchange is not mature as it should be and stock market is not efficient either. In sum, the stock price crash risk is significant for current and potential investors and can have unrecoverable effects. In this way, this study tries to focus on one factor that influences stock crash risk, namely audit quality.

The results of the first hypothesis analysis show that there is a significant and negative relationship between audit quality and *DUVOL* of stock crash risk. Therefore, from *DUVOL* aspect, audit quality is an important factor that can reduce stock

crash risk. This is consistent with result of other studies. It is recommended to Audit Organization, as official accounting and auditing standard setter, to develop standards for improving audit quality. In addition, Iranian Association of Certified Public Accountants, as supervisor of audit firms, should try to increase audit quality by using some monitoring tools, such as using auditors according to their experience in the industry, decrease stock price crash risk.

The results of second Hypothesis examination show insignificant negative relationship between audit quality and crash. In other word, cautiously it can say that according to economic condition and stock price restriction by Tehran stock exchange, crash is not a good proxy for stock crash risk in Iran.

It is needless to say that Iran is in hyperinflation condition; however, the data extracted from the financial statements are not adjusted. If data were adjusted, current results may not have been achieved.

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