The Relationship between Audit Fees and Stock Price Crash Risk

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Abstract

The purpose of this study is to examine the relationship between audit fees and stock price crash risk. The study period is from 2013 to 2017 and the selected sample consists of 110 companies listed on Tehran Stock Exchange (TSE). To test the hypotheses of the research, the ordinary least squares regression is used. The findings show that there is a positive and significant relationship between audit fees and stock price crash risk. In other words, for companies with higher audit fees, there is a greater risk of falling stock prices.

Keywords: Audit Fees, Stock price crash risk, down-to-up volatility, Negative skewness of stock return.

Introduction

The cost of external audits (audit fees) refers to the amount of compensation for services performed by external auditors. The compensation for the services is related to the amount of time used to complete the work and the value of services provided to the client or the firm (Tulus, 2014). One of the main controversies in the audit profession is the determination of the audit fees.

Stock price crash risk has also attracted the attention of many accounting professional researchers and activists in recent years, especially after the financial crisis of 2008. Stock price crash risk is a phenomenon at the market level; in other words, stock price reductions are not limited to one specific stock and include all stocks on the market (Chen, Hong, and Stein, 2001). Meanwhile, according to research, the behavior of investors as one of the main risk factors is presented in stock prices crash risk (Hong and Stein, 2003).

Kothari, Shu, and Wysocki (2009) stated that managers do not disclose bad news and hide it until a certain threshold from investors. When the accumulated bad news crosses a "tipping point", the entity will experience negative stock return, i.e. stock price crash risk (Jin and Myers, 2006; Hutton, Marcus and Tehranian, 2009; Kim and Zhang, 2010). The revelation of bad news is a shock to investors, but is less likely to surprise an entity's auditor because she has access to a broad array of client-specific information well in advance of investors. Auditors are particularly attuned to the changing risk profile of their clients, including changes in idiosyncratic risk, and price audits accordingly. (Hribar, Kravet and Wilson, 2010; Picconi and Reynolds, 2010), because audit fees reflect a significant amount of information (including the ambiguity of information). Also, audit fees reflect economically important conditions for investors. As a result, as the complexity of an entity's circumstances grows, the audit costs of that entity increase (Hackenbrack, Jenkins and Pevzner, 2014). This leads to a loss of market expectations and stock price crash risk. As a result, the audit fees figure, which represents ambiguity in entity information, is related to a crash that is affected by ambiguity in information (Hackenbrack et al., 2014).

With the above-mentioned reasons, the main questions for this study can be formulated as: "Is there a significant relationship between the audit fees and stock price crash risk?"

Therefore, stock price crash risk is an important issue for investors in particular, and if they are aware of the stock price crash, this can change their investment behavior. This study will help us to improve our knowledge in this

field .Also, due to the lack of similar research, it is necessary to undergo empirical tests in the economic environment of the country in order to better plan its findings.

This paper has the following sections, the first section reviews the literature and discusses an overview of the theoretical basics, and then research method, hypotheses and empirical results have been discussed. The final part contains a conclusion, discusses limitation and provides some suggestions.

Background

The more reliable, relevant and high-quality information of the managers, it is more beneficial for investors. Increasing the quality of information disclosure from the theoretical perspective is associated with the reduction of information asymmetry, cost of capital and increased liquidity (Diamond and Verrecchia, 1991; Kim and Verrecchia, 1994; Lambert, Leuz and Verrecchia, 2007). From the empirical point of view, there is also an increase in the quality of disclosure of information by increasing liquidity (Healy and Palepu, 2001; Botosan and Plumlee, 2002) and reduced cost of capital (Heflin, Shaw and Wild, 2005; Lang and Lundholm, 2000; Botosan and Plumlee, 2002).

These findings are consistent with the idea that higher levels of disclosure quality reduce the risk of future cash flows.

These findings are consistent with the notion that greater levels of disclosure quality reduce the risk associated with estimating future cash flows and lowering the return demanded by investors. Moreover, increased disclosure quality is thought to decrease information asymmetry by aligning the information that investors have with that of managers. To the extent that the negotiated audit fees impound client-specific information known to managers but not investors, prompt disclosure of the negotiated audit fee will reduce manager/investor information asymmetry and, consequently, benefit stakeholders (Hackenbrack et al., 2014).

Information asymmetry is a concept like ambiguity and is most similar to it. In the Jin and Myers (2006) model, companies with unclear and ambiguous information experience a significant stock price crash risk. Hutton et al. (2009) also find that there is a significant relationship between ambiguity and stock price crash risks. They use earnings management via discretionary accruals as an indicator for measuring ambiguity. Their findings indicate that companies involved in earnings management can keep bad news up to the tipping point and this leads to stock price crash risk. Research by Kim et al. (2010) provided

additional evidence of the relationship between ambiguity and stock price crash risk by providing that tax avoidance has a positive relationship with stock price crash risk. The results are consistent with the findings of Hutton et al. (2009) and Kim et al., (2010).

In addition to that, due to the future increase in audit fees as a result of more ambiguity and complexity of information, existing ambiguity can have a positive effect on stock price crash risk. The auditor's working hours and procedures are sensitive to the actions of the auditor and the audit fees are higher for high-risk clients, which can lead increase the risk of stock prices crash (O'Keefe, Simunic, and Stein, 1940).

Institutional ownership had a positive and significant effect on audit fees. However, there is no significant relationship between managerial ownership, audit fees and qualified opinion (Ebrahimi, Peyvandi, and Fakharmanesh, 2015).

Rasekhi and Arad (2017) found that the auditor's fees had a negative and significant relationship with delay in the presentation of the audit report.

In another study, Fallah Zadeh et al. (2017) reported that there is a two-way negative and significant relationship between the discretionary disclosure of information and stock price crash risk. In other words, managers' willingness to hide bad news and disclose good news rapidly can lead to stock price crash risk.

The managerial ownership at various levels (including total, low, medium and high levels), positively moderates the relationship between weak internal control and audit fees. Also, In the comparison of low, medium and high levels of managerial ownership, the high level has the most moderating effect on this relation and as the level of ownership increases, the moderating effect increases accordingly.

In addition to that, the auditors' increase their actions in cases where corporate governance is weak and the manipulating risk of financial figures is high which increase their fees (Bedard and Johnstone, 2004)

Hackenbrack et al. (2011) reported that there is a significant relationship between audit fees and stock price crash risk. They used the audit fees as ambiguity in entity-specific information and found that as the ambiguity increased, so did the risk of falling stock prices.

There is a positive and significant relationship between internal control weaknesses and audit fees. Also, the relationship between weaknesses in

internal control and audit fees is moderated by managerial ownership, and as the managerial ownership increases, the severity of the moderation increases (Mitra Bikki, and Al-Hayale, 2017).

Given the theoretical basics and the review of the literature, the research hypothesis is as follows:

There is a significant relationship between audit fees and stock price crash risk (negative skewness of stock return and down-to-up volatility).

Methodology

The present research is applied and descriptive. Moreover, it is a correlation research type because it investigates the relationship between independent and dependent variables. To test the research hypothesis panel data with multiple regression method are used.

The following conditions were considered to collect data:

1. The entity is not a bank, an investment company, an insurance company, or a brokerage firm.

2. The entity has attended in the stock market from 2013 to 2017 continuously and has not interrupted its stocks transactions more than 6 months per year.

3. The fiscal year-end of entity is March 20.

4. The entity has not changed its fiscal year.

5. The financial data of the entity is available for this period.

Upon the above conditions, only 110 entities were selected. The research period is 5 consecutive years, so the sample size is 550 firm- years' observations. The required data for analyzing is collected from entities' annual reports and related software such as Rahavard Novin.

In this research, we use three independent variables (audit fees), dependent (stock price crash risk) and control variables (financial leverage, company size, market value to book value ratio of equity and return on equity). The measurement of the variables is as follows:

Audit fees (LAFEE)

As defined by Amani and Davani (2009) LAFEE is the natural logarithm of the audit fees paid to the auditor for the fiscal year

Stock price crash risk

We used two measures of firm-specific crash risk. Specifically, we performed the calculations as follows:

Negative skewness of stock return

To construct our crash risk measures, we build on Jin and Myers (2006) who define a stock price crash as a remote, negative outlier in a firm's residual stock return. Accordingly, we compute residual stock returns and measure crash risk using two common metrics: the crash dummy, and negative skewness. Specifically, we first calculate firm-specific monthly returns from the following expanded index model regression for each firm-year (Hutton et al., 2009):

$$r_{i,t} = \beta_j + \beta_1 r_{mkt,t-2} + \beta_2 {}_{rmkt,t-1} + \beta_3 r_{mkt,t} + \beta_4 {}_{rmkt,t+1} \qquad (1)$$
$$+ \beta_5 r_{mkt,t+2} + \varepsilon_{i,t}$$

Where $r_{i,t}$ is the stock return of firm i in month t, $r_{mkt,t}$ is the return on market in month t. We include the lead and lag market and industry index returns to account for non-synchronous trading (Razmian et al, 2020). Following prior research (e.g., Chen, Hong, and Stein 2001, Hutton et al., 2009), we estimate the firm-specific monthly return $w_{i,t}$ as the natural log of one plus the regression residual ($W_{i,t} = Ln (1 + \varepsilon_{i,t})$). We obtain similar results by estimating crash risk measures using raw residual returns.

Crash risk is the negative conditional skewness of firm-specific weekly returns over the fiscal year (NCSKEW). NCSKEW is calculated by taking the negative of the third moment of firm-specific weekly returns for each year and normalizing it by the standard deviation of firm-specific weekly returns raised to the third power. Specifically, for each firm j in year t, NCSKEW is calculated as follows:

A higher value of *NSKEW* implies a more left-skewed return distribution, and thus a more ''crash-prone'' stock.

$$NCSKEW_{j,t} = - [n(n-1)^{\frac{3}{2}} \sum w_{i,t}^3] / [(n-1)(n-2)\left(\sum W_{i,t}^2\right)^{\frac{3}{2}}] \qquad (2)$$

Where n is the number of observations of firm-specific monthly returns during the fiscal year t. A high value of NCSKEW indicates a serious negative skewness and a high level of stock price crash risk (Razmian et al, 2020).

Down-to-up volatility (DUVOL)

Given that higher-moment calculations are sensitive to data outliers, we use an alternative measure of the stock returns asymmetry, DUVOL (down-to-up volatility), proposed by Hong and Stein (2001).

For stock, we separate the above-average returns from the below-average returns over three months. We then calculate the standard deviation for the two subsamples and take the log ratio of the standard deviation of down days to the standard deviation of up days.

$$\text{DUVOL}_{j,t} = -\text{Log} \frac{(n_u - 1) \sum_{\text{DOWN}} w_{j,t}^2}{(n_d - 1) \sum_{\text{UP}} W_{j,t}^2} \tag{3}$$

Where n_u and n_d are the number of up and down months over the fiscal year t, respectively. Also, $W_{j,t}$ is the specific monthly returns of j company in month t during the fiscal year. For any stock i over a one-year period, we separate all the months with firm-specific monthly returns above (below) the mean of the period and call this the ''up'' (down) sample. We then calculate the sum of the square of $W_{i,t}$ for the ''up'' and ''down'' samples separately. Similar to NCSKEW, a large value of DUVOL indicates a high level of stock price crash risk.

Control variables

Financial Leverage: This variable is measured by the ratio of total debt to the book value of total assets. The goal is to control the effect of debt coverage on profitability and wealth (Riahi-Belkaoui, 2003). Khan and Watts (2009) also argued that in entities with higher leverage, there is a greater agency conflict between shareholders and creditors. Also, entities with a problem in terms of financing and liquidity are more likely to file a lawsuit (Khan and Watts, 2009), which could increase the likelihood of stock price crash risk.

Firm Size: The larger entities, due to their particular characteristics, have always received attention from different groups of investors, market regulators, and even politicians. This will allow the quality of the information disclosed by these entities to be examined by numerous regulatory authorities. On the other hand, given the need of large corporations to provide the funds needed from the capital market and other markets, they are motivated to reduce their cost of capital by increasing the quality of financial reporting and disclosure. Thus, in large entities, there is a little chance of accumulation and non-disclosure of bad news. This will prevent the bulk entry of bad news into the market, and thus reduce stock price crash risk (Kim and Zhang, 2010). To calculate the firm size

variable, the natural logarithm of the total assets was used.

The ratio of market value to book value of equity: Khan and Watts (2009) have stated that entities with a higher market-to-book ratio of equity have higher investment opportunities. Also, it is expected that the stock return of entities with high market-to-book value of equity will be more volatile. On the other hand, entities with more volatile stock returns are more likely to experience huge losses. This increases the likelihood of litigation risk against the company, as well as the likelihood of stocks prices crash.

Return on equity: It is measured by the net profit of shareholders to total equity. Hutten et al. (2009) stated that entities with a high return on equity (as a benchmark for better performance) have a lower stock price crash risk.

Research Findings

Table 1 presents descriptive statistics of the variables under study. It should be noted that the number of investigated observations for calculating the dependent, independent and controlled variables is 550 firms-years observations.

Table 1. Descriptive statistics

Variable	Mean	Max	Min	SD
Negative Skewness of Stock Returns	-0.1731	3.7520	-3.9729	**1.5936**
Down to Up Volatility	2.3540	6.1497	-0.5037	**1.8423**
Audit fees	1.8345	2.4699	0.7952	**1.1236**
Financial Leverage	0.7961	0.8645	0.3003	**0.1242**
Firm Size	5.7518	8.0073	4.5402	**0.6261**
Market-to-Book Value of Equity	1.7473	5.4834	-4.5627	**2.1386**
Return on Equity	0.4037	1.3892	-7.4075	**0.5763**

The findings show that financial leverage is 0.79. This means that the debts of the sample companies are 79% of their assets. Also, the market-to-book value of equity is 1.74. In addition, stock returns have averaged 40 per cent.

Results

Findings of selecting the test pattern of each hypothesis showed in Table 2.

Table 2. Findings of selecting the test pattern of each hypothesis

Hypothesis	Test	Test statistics	Significance	Selected model
First hypothesis	Chow test	8.3756	0.0000	**Random**
	Housman test	1.6860	0.7933	
Second hypothesis	Chow test	8.0230	0.0000	**Random**
	Housman test	2.7963	0.5925	

According to the findings of Table 2, both the hypotheses show that the significance level of the Chow test is lower than 0.05 and the significance level of the Housman test is above 0.05, so that random affects model can be used to test it.

In the following, Tables 3 and 4 present the findings of the research hypothesis results.

Table 3. Findings of the estimation of the regression model for the hypothesis testing

$NCSKEW_{it} = B_0 + B_1 LAFees_{it} + B_2 Lev_{it} + B_3 Size_{it} + B_4 MTB_{it} + B_5 ROE_{it} + \epsilon_t$					
Dependent variable: Crash risk (negative skewness of stock returns)					
Variables	**Coefficient**	**T statistics**	**Significance**		
Audit fees	4.2074	4.9548	0.0001	**R^2**	**0.2950**
Financial leverage	2.5641	3.0094	0.0457	**Adjusted R^2**	**0.2546**
Firm size	-3.1460	-3.1646	0.0139	**D.W**	**1.7245**
Market to book value	-3.4854	-3.8239	0.0038	**F statistics**	**5.2972**
Return on equity	1.9308	1.8543	0.0648	**Significance of F statistics**	**0.0020**
Constant	0.7563	0.7563	0.6322		

The findings of this section show that there is a positive and significant relationship between audit fees and stock price crash risk (25%) by using the measure of negative skewness of stock returns.

Table 4. Findings of the estimation of the regression model for testing the second hypothesis test

$NCSKEW_{it}= B_0+ B_1 LAFees_{it}+ B_2 Lev_{it}+ B_3 Size_{it}+ B_4 MTB_{it}+ B_5 ROE_{it}+ \epsilon_t$					
Dependent variable: Crash risk (negative skewness of stock returns)					
Variables	**Coefficient**	**T statistics**	**Significance**		
Audit fees	4.2074	5.2038	0.0000	R^2	**0.2434**
Financial leverage	3.8937	4.7529	0.0085	**Adjusted R^2**	**0.2168**
Firm size	-1.8907	-1.6898	0.0628	**D.W**	**2.0163**
Market to book value	-3.4854	-3.6153	0.0129	**F statistics**	**6.4514**
Return on equity	1.7325	1.7634	0.0762	**Significance of F statistics**	**0.0112**
Constant	0.8919	0.9028	0.8534		

Table 4 indicates the results of the second hypothesis. Findings of Table 4 regarding the relationship between audit fees and stock price crash risk using down- to- up volatility showed that audit fees have a positive and significant relationship with stock price crash risk (21%) using down- to- up volatility.

In addition, the findings of the autocorrelation analysis of error terms using Durbin-Watson statistics also indicate the auto-correlation error in both patterns. Also, the F statistics and the significance level of this statistic in two tests related to the research hypothesis indicates that the regression model is significant.

Conclusion

Findings showed, there is a positive and significant relationship between audit fees and stock price crash risk. It means that with the increase in audit fees, the stock price crash risk is increased. As stated in the theoretical basis, the audit fees figure, which is somehow indicative of complexity and ambiguity in entity information, is related to the stock price crash risk. Audit fees also reflect a significant amount of information that includes ambiguity in information and

indicates the conditions that are economically important for investors. As a result, the higher the complexity of the entity's circumstances, the greater the probability of higher audit fees (Hackenbrack et al., 2014). In general, auditing standards require auditors to change the nature and extent of auditing and organization processes according to clients requirements. For example, in some cases, such as predicting a decrease in customer market share, predicting a loss of a client, predicting risk for the litigation, and similar cases, the only way for the auditor to determine appropriate fees is to answer the questions most needed to protect himself in this events. As a result, with increased audit fees resulting from the auditor's estimation of high complexity and ambiguity, this ambiguity and complexity could increase stock price crash risk. This issue was supported in this study and is consistent with the findings of Hackenbrack et al. (2014).

In general, due to the increasing changes in auditing standards including national auditing standards, auditors need to change the nature and scope of auditing processes and the organization according to customer needs. For example, an auditor changes the amount and composition of the activity required in response to the involvement of an entity in a series of complex transactions. In addition, in some cases, such as prediction decline in the market share of a client, loss of a client, litigation risk and similar cases, the only way for the auditor is to determine the appropriate fees in response to further inquiries required to protect himself in these events.

Suggestions and limitations

It is also suggested that in further studies, considering the importance of information disclosure issues (including the detailed disclosure of audit fees) and reducing stock price crash risk, that researchers pay more attention to this issue. That while proving the relationship between increased information disclosure and performance of companies, transparency and market efficiency are increased. Besides, in future researches, heterogeneity of investors' perspective, adherence to corporate ethics and social commitment, quality of the audit committee, comparability of financial statements with stock price crash risk can be also considered. Like many studies, this study has limitations, for example, inaccessibility to entity-wide information as well as the elimination of holding companies and intermediaries.

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