The effect of Environmental Performance on Stock Price Crash Risk with Emphasis on Conservative Accounting[1]

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Research Paper

INTRODUCTION

In recent years, many studies have focused on corporate environmental performance (responsibility) to examine its determinants and economic consequences. In response to this gap, the present study examines the relationship between corporate environmental performance and stock price crash risk. Studies have found that firms with better environmental performance have higher-quality financial reporting (Du et al., 2017; Ingram and Frazier, 1980; Orlitzky et al., 2003) and engage in fewer bad news hoarding activities (Du et al., 2017). Therefore, this study predicts that corporate environmental performance is significantly negatively associated with stock price crash risk. In addition, Petersen (2004) and Petersen and Rajan (1994) find that hard information (e.g. financial information) and soft information (e.g. voluntary environmental information disclosure) interact with each other (substitute or strengthen). This study predicts that accounting conservatism attenuates the mitigating effect of environmental performance on stock price crash risk.

To achieve this research goal, two hypotheses have been proposed as follows:

Overall, environmentally responsible firms can obtain a
good reputation and competitive advantage, increase (reduce) the likelihood of going concerned (discontinuity), convince investors of managers " moral integrity, improve information transparency, and indicate managers " lower likelihood of hoarding bad news. Ultimately, environmentally friendly firms have lower future crash risk. Based on the above discussion, Hypothesis 1 is proposed as follows:

Hypothesis 1: corporate environmental performance is negatively associated with future crash risk.

Multivariate Test Model for Hypothesis 1 To test Hypothesis 1, which predicts that corporate environmental performance is negatively associated with future stock price, I estimate Eq. (1) to link future crash risk with corporate environmental performance and firm-specific control variables (Hutton et al., 2009; Kim et al. 2011) :

$$(1)$$

$$CRASH_{i;t} = \gamma_0 + \gamma_1 CEP_{i,t-1} + \gamma_2 BLOCK_{i,t-1} + \gamma_3 NCSKEW_{i,t-1}$$
$$+ \gamma_4 INSTSHR_{i,t-1} + \gamma_5 DTURN_{i,t-1} + \gamma_6 SIGMA_{i,t-1} + \gamma_7 RET_{i,t-1}$$
$$+ \gamma_8 SIZE_{i,t-1} + \gamma_9 DTE_{i,t-1} + \gamma_{10} BTM_{i,t-1} + \gamma_{11} ROA_{i,t-1}$$
$$+ \gamma_{12} ACCM_{i,t-1} + \gamma_{13} TAX_{i,t-1} + \gamma_{14} PENALTY_{i,t-1} + \varepsilon_{i,t}$$

Based on the literature, I predict that the negative association between corporate environmental performance and stock price crash risk is less pronounced for firms with higher conservatism scores than for those with lower conservatism scores. Based on the above discussion, I formulate Hypothesis 2 in the alternative form as follows:

Hypothesis 2: accounting conservatism attenuates the negative association between corporate environmental performance and future crash risk.

Hypothesis 2 predicts that accounting conservatism attenuates the negative association between environmental performance and future crash risk. To test Hypothesis 2, I estimate Eq. (2) to link future crash risk (*CRASH*) with environmental performance (*CEP*), accounting conservatism (*C_SCORE*), the interactive item (*CEP×C_SCORE*), and a set of firm-specific control variables:

$$CRASH_{i;t} = \gamma_0 + \gamma_1 CEP_{i,t-1} + \gamma_2 C - SCORE_{i,t-1}$$
$$+ \gamma_3 CEP * C - SCORE + \gamma_4 BLOCK_{i,t-1} + \gamma_5 NCSKEW_{i,t-1}$$
$$+ \gamma_6 INSTSHR_{i,t-1} + \gamma_7 DTURN_{i,t-1} + \gamma_8 SIGMA_{i,t-1} + \gamma_9 RET_{i,t-1}$$
$$+ \gamma_{10} SIZE_{i,t-1} + \gamma_{11} DTE_{i,t-1} + \gamma_{12} BTM_{i,t-1} + \gamma_{13} ROA_{i,t-1}$$
$$+ \gamma_{14} ACCM_{i,t-1} + \gamma_{15} TAX_{i,t-1} + \gamma_{16} PENALTY_{i,t-1} + \varepsilon_{i,t}$$

$$(2)$$

CRASH3.09t = a dummy variable of stock price crash risk, equal to 1 if a firm-year's stock price experiences one or more firm-specific weekly returns falling 3.09 standard deviations below the mean firm-specific

weekly returns (*Wj,t*) over the calendar year (3.09 being chosen to generate frequencies of 0.1% in the normal distribution during the calendar year period), and 0 otherwise (Kim *et al.*, 2011).

CEPt-1 = corporate environmental performance in the last year based on the Global Reporting Initiative (2006, please refer to the procedures for calculating CEP), involving seven components (i.e. governance structure and management systems, credibility, environmental performance indicators, environmental spending, vision and strategy claims, environmental profile, and environmental initiatives) and 42 subcomponents (Clarkson *et al.*, 2008; Du *et al.*, 2014).

C_SCOREt-1 = a firm's conservatism score in year *t*-1, which is computed on the basis of

Basu (1997) and the following three models (Ettredge *et al.*, 2012; Heflin *et al.*, 2015; Khan and Watts, 2009; DeFond *et al.*, 2016):

$$C\_SCORE = \beta 4, i, t = \lambda 1 + \lambda 2 SIZE + \lambda 3 M/B + \lambda 4 LEV, \tag{3}$$

$$G\_SCORE = \beta 3, i, t = \mu 1 + \mu 2 SIZE + \mu 3 M/B + \mu 4 LEV, \text{ and} \tag{4}$$

$$Xi,t = \beta 1, i, t + \beta 2, i, tDi, t + (\mu 1 + \mu 2 SIZE + \mu 3 M/B + \mu 4 LEV) \times Ri, t + (\lambda 1 + \lambda 2 SIZE + \lambda 3 M/B + \lambda 4 LEV) \times Di, t \times Ri, t + (\delta 1 SIZE + \delta 2 M/B + \delta 3 LEV + \delta 4 Di, t SIZE + \delta 5 Di, t M/B + \delta 6 Di, t LEV) + \varepsilon i, t, \tag{5}$$

where *i* indexes the firm, *t* indexes time, *X* is income before extraordinary items (operating profit in the financial statements of Chinese listed firms) scaled by lagged market value, *R* is annual returns compounded from monthly returns ending four months after the calendar year-end, *D* is an indicator variable equal to 1 for firms with negative returns and 0 otherwise, and *ε* is the residual. *C_SCORE* is derived from linear functions of three firm-specific characteristics including firm size (*SIZE*, the natural logarithm of market value of equity), market-to-book ratio (*M/B*), and leverage (*LEV*, the sum of long-term and short-term debt divided by market value of equity). *G_SCORE* or *β*3 denotes the timeliness of good news, and *C_SCORE* or *β*4 denotes the incremental timeliness of bad news.

NCSKEWt-1 = the negative conditional return skewness for firm *j* in year *t* in year *t*-1.

INST_SHRt-1 = the percentage of shares owned by institutional investors in year *t*-1 (Kim *et al.*, 2011).

DTURNt-1 = average monthly share turnover over the current calendar year period minus the average monthly share turnover over the previous calendar year period (monthly share turnover is calculated as the monthly trading volume divided by the total number of shares outstanding during the month) (Chen *et al.*, 2001).

SIGMAt-1 = the standard deviation of firm-specific weekly returns over the calendar year period *t*-1 (Kim *et al.*, 2011).

RETt-1 = the arithmetic average of firm-specific weekly returns in year t-1 (Kim et al., 2011).

SIZEt-1 = the natural logarithm of the market value of equity at the end of year *t*-1 (Kim *et al.*, 2011).

DTEt-1 = the lagged ratio of total liabilities at the end of year *t*-1 to the market value of equity at the end of year *t*-1.

BTMt-1 = the lagged ratio of book-to-market, measured as book value scaled by the market value of equity at the end of year *t*-1 (Kim *et al.*, 2011; Chen *et al.*, 2001).

ROAt-1 = returns on total assets in year *t*-1, measured as income before extraordinary items divided by lagged total assets (Kim *et al.*, 2011).

ACCMt-1 = the extent of discretionary accruals, measured as a three-year moving sum of absolute discretionary accruals based on the modified Jones model (Kim *et al.*, 2011).

PENALTYt-1 = a dummy variable equal to 1 if a firm is punished by regulators for financial misconduct in year *t*-1, and 0 otherwise.

TAXt-1 = a firm's estimated likelihood of tax sheltering (Kim *et al.*, 2011), measured.

BLOCKt-1 = the percentage of shares held by the controlling shareholder in year *t*-1.

MATERIALS AND METHODS

This research is applied in terms of purpose and descriptive correlation in terms of nature and method. Also, this research is a post-event (non-experimental) type of research in terms of time and in terms of the type of reasoning for the conclusion, it is considered inductive research. In this research, the library method is used to collect the required data and information and consists of two parts. The first part includes the subject literature and the definition and identification of the concept of independent and dependent variables and the discussion of how they interact using the theories of financial scientists; Books, articles, dissertations, websites and specialized Persian and English magazines have been used. The second part is the collection of research data that the required data has been obtained from the library of the stock exchange, new software Rahavard, financial statements and announcements published by companies on the Caudal site belonging to the stock exchange organization. In this study, multivariate regression is used as a statistical method. In the regression method, the main purpose is to investigate the relationship between the dependent and independent variables of the research. After collecting information, Excel and Eviews software are used to analyze the data and extract descriptive and inferential statistics.

The data required for this study have been collected from the actual information of companies listed on the Tehran Stock Exchange during the years 1390-1398, and using the systematic removal method to determine the sample size based on the following criteria:

1. For the purpose of comparability, the fiscal year ending March 20 is considered.
2. Not be part of financial companies, investments, or financial intermediation companies.
3. Their financial information is available.
4. There is no change in the financial year during the time domain of the research.
5. The required information about the variables is available.

CONCLUSION

This study examines the influence of corporate environmental performance on stock price crash risk and further investigates the interactive effect between environmental performance and accounting conservatism on stock price crash risk. Using a sample of listed firms, this study finds a negative relationship between environmental performance and future crash risk, as well as substitutive effects between environmental performance and accounting conservatism on mitigating crash risk.

My findings also have several managerial implications. First, it motivates two branches of future research: (1) the association between corporate environmental performance and stock market reactions and (2) market efficiency in incorporating and identifying environmental reputation as an intangible asset. Stock price crash risk can be viewed as a special and negative market reaction to bad news hoarding (Hanlon and Slemrod, 2009). Because environmentally responsible firms can attract environmentally sensitive stakeholders, firms with better environmental performance can distinguish themselves from their counterparts, and thus the impact of corporate environmental performance on stock market reactions and market efficiency is worthy of further research.

Second, this study suggests that environmentally responsible firms face fewer future price crashes due to their reputation, fewer future risks, managers' better moral integrity, and greater information transparency. Thus, environmental performance can be viewed as an important conduit for communicating "soft information" and managers' moral integrity to the market.

Finally, my study reveals that accounting conservatism mitigates future crash risk and validates the moderating effect of accounting conservatism. These findings can motivate future studies to further focus on other characteristics of accounting information and examine their impacts on stock price crash risk. More importantly, this study shows that accounting

conservatism weakens the negative effect of environmental performance on future crash risk, suggesting that accounting information and business ethics can substitute each other in affecting corporate behavior.

Of course, this study has its limitations. First, due to the fact that there is as yet no CSR database in Iran, I follow GRI (2006) and Clarkson et al. (2008) to hand-collect data on environmental performance.

My sample covers only nine years, a relatively short period, and thus my findings need validation by additional examinations based on longer sample periods.

Finally, this study is conducted in the context of Iran, and thus my findings may not be generalizable to developed markets.