Voluntary Risk Disclosure, Firm-level Governance, and Firm Value: Evidence from the UK

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Abstract

Research on how firm-level governance (FL_G) impacts the informativeness of risk reporting is largely limited. Therefore, this study adds to the literature by considering the following research questions: First, to what extent does FL_G affect voluntary risk information? Second, does voluntary risk information due to better FL_G include information content that affects investors' valuation of firms? From a sample of UK FTSE350 firms, this study uses the automated textual analysis technique to code voluntary risk information in the annual reports of these firms. We use the value of a firm after adjustments for the industry median as a proxy for investors' response to risk reporting. The results suggest that UK corporations with higher board independence and more prominent audit committees are likely to disclose more risk information voluntarily. In contrast, corporations with larger board sizes and higher managerial ownership provide less voluntary risk disclosure. Furthermore, voluntary risk disclosure includes information content that improves investors' valuations of UK firms, specifically in firms with more independent directors, smaller managerial ownership, and/or larger audit committees. The results have important implications for UK investors, who might be well-served to depend on specific FL_G mechanisms to form their expectations about firm value.

1. Introduction

The last few years have witnessed substantial academic interest in risk disclosure. The disclosure of risk information facilitates monitoring, mitigates information asymmetry between corporate managers and shareholders, increases capital allocation efficiency, and decreases capital costs (Durnev et al., 2004). It also provides a basis for identifying corporate risks and uncertainties (Elshandidy et al., 2015). Such disclosure helps stock-market participants assess the value, timing, and risk of a firm's prospective cash flows (Elbannan and Elbannan, 2015). However, corporate directors may be unwilling to disclose this type of information either for fear of disclosing proprietary information or due to the litigation risk that a firm may face due to this disclosure (Bourveau et al., 2018; Krishnan and Lee, 2009). The discretionary nature of voluntary risk disclosure at the convenience and sole discretion of a corporation may also lead to information asymmetry issues that may adversely affect the efficient allocation of its resources (Healy and Palepu, 2001).

Firm-level governance (henceforth FL_G) acts as a monitoring mechanism that reduces information asymmetry between corporate directors and shareholders by increasing the level of disclosure and transparency (Hendry and Kiel, 2004). It is posited that corporations with high standards of FL_G should provide more informative disclosure than corporations with lower standards of FL_G practices (Wang and Hussainey, 2013; Hossain et al., 2005; Karamanou and Vafeas, 2005). A substantial number of studies demonstrate that the FL_G monitoring role significantly impacts the tendency toward better disclosure (e.g., Kanagaretnam et al., 2007; Lim et al., 2007; Patelli and Prencipe, 2007). However, there is an absence of studies exploring how FL_G impacts the informativeness of risk reporting. Examining this nexus is increasingly needed since risk information might be incorporated into shareholders' price decisions and thus enhance their valuation of firms by decreasing information asymmetry (e.g., Campbell et al., 2014).

The current study therefore aims to explore, first, whether and to what extent FL_G affects voluntary disclosure of risk information in the UK annual reports; and second, whether voluntary risk information due to better FL_G includes information content that affects UK firms' valuation. The study is motivated by the following considerations: First, while extensive research on risk disclosure focuses heavily on the US (e.g., Bao and Datta, 2014; Filzen, 2015; Hope et al., 2016; Kravet and Muslu, 2013), limited UK studies have been carried out (Elshandidy and Neri, 2015). There is a specific lack of UK evidence regarding the influence

of FL_G on voluntary risk disclosure's informativeness. Second, the UK is an interesting context for studying this relationship. Unlike the US, there is no standardized structure for the content of annual reports in the UK. This gives UK corporate managerial teams greater flexibility in terms of their annual reports' content, and accordingly, significant variations may exist among UK corporations in their disclosure of voluntary risk information. Besides, ICAEW (the Institute of Chartered Accountants in England and Wales) has expressed concerns regarding the inaccuracy of the risk information UK firms provide (ICAEW, 2011). This then raises concerns about the informativeness of UK corporate risk disclosures. Third, the contradictory arguments between proponents (e.g., Elshandidy et al., 2015; Healy and Palepu, 2001) and opponents (e.g., Bourveau et al., 2018; Krause et al., 2017) of providing risk disclosure may raise concerns regarding information asymmetry, which could harm corporate value if not mitigated. In response, this study addresses this issue by investigating how FL_G impacts the level and informativeness of voluntary risk disclosure.

This study, therefore, contributes first to the limited UK research on risk disclosure (e.g., Elshandidy and Neri, 2015) by providing evidence on how FL_G affects voluntary risk disclosure. It provides evidence that UK firms' voluntary risk disclosure is a positive function of corporate board independence and audit committee size. At the same time, it is a negative function of corporate board size and managerial ownership. This helps rationalize the ongoing debate on the influence of FL_G on risk disclosure. Second, our study provides the first UK evidence of the influence of FL_G on voluntary risk disclosure's informativeness. The results indicate that voluntary risk disclosure includes information content that enhances investors' valuations of UK firms, especially in firms with more independent directors, smaller managerial ownership, and/or larger audit committees. Unlike prior studies that investigate the informativeness of risk disclosure through its impact on shareholder perception of risk (Kravet and Muslu, 2013) and stock liquidity (Elshandidy and Shrives, 2016), this study enriches the literature by providing evidence on how disclosing voluntary risk information impacts firm value. The results should be helpful to UK investors, who might consider the voluntary level of risk disclosure in their price decisions and thus enhance their corporate valuation. They might therefore be well-served to depend on specific FL_G mechanisms (e.g., corporations with more independent directors, smaller managerial ownership, and/or larger audit committees) to help them forecast the value of firms.

The rest of the study is structured as follows. Section 2 reviews the literature and develops research hypotheses. Section 3 discusses the research design regarding data collection, variable

measurements, and empirical models. Sections 4 and 5 present the empirical findings and discussions, while section 6 provides the key conclusions, implications, and future research suggestions.

2. Literature review and hypothesis development

Theoretically, information asymmetry between corporate directors and shareholders is lower in corporations with good FL_G (Healy and Palepu, 2001). Empirically, mixed findings have been reported regarding the effect of FL_G on voluntary disclosure in different contexts, including the US (Hope et al., 2016) the UK (Elshandidy and Neri 2015), Australia (O'Sullivan et al., 2008), India (Saggar and Singh, 2017), South Africa (Ntim et al., 2012), Singapore (Eng and Mak, 2003), and Qatar (Elgammal et al., 2018). Our study starts by developing hypotheses based upon the relationships between voluntary risk disclosure and the following observable FL_G mechanisms: board size, board meetings, board independence, CEO duality, managerial ownership, and audit committees. We then develop a hypothesis on the impact of FL_G on the relationship between voluntary risk disclosure (hereafter, VRSKD) and firm value.

2.1 The size of corporate boards of directors and VRSKD

Agency theory posits that a large board of directors will have diverse backgrounds, knowledge, and expertise that enhance the discussion and sharing of knowledge and opinions within a board. Extensive studies, therefore, suggest the usefulness of a large board in supervising and monitoring management activities (e.g., Buertey and Pae, 2020; Elshandidy and Neri, 2015; Hidalgo et al., 2011; Karamanou and Vafeas, 2005). Subsequently, this may lead to a potential increase in VRSKD. Yet other research (Boubakri et al., 2013; Bokpin et al., 2011) argues that large boards may be ineffective in controlling managerial activities: Many directors may cause a lack of coordination among different board members and thus reduce their ability to mitigate the agency problem.

There is no definitive empirical evidence on the influence of board size on disclosing voluntary information. Prior studies document positive (Wang and Hussainey, 2013), negative (Elgammal et al., 2018), and insignificant (Karamanou and Vafeas, 2005) effects of board size on the disclosure of voluntary information. Turning to risk disclosure, a few studies find a direct effect of board size on corporate risk disclosure (Saggar and Singh, 2017; Elshandidy and Neri, 2015; Elshandidy et al., 2013). The UK is characterized by a well-developed corporate governance system, and corporate boards have a great diversity of expertise (Wang

and Hussainey, 2013). This may suggest a positive effect of corporate board sizes in the UK on VRSKD. Therefore, we posit the following:

H[1]: Firms with larger board sizes are likely to provide more VRSKD.

2.2 The frequency of corporate board meetings and VRSKD

Board meeting frequency reflects the extent of board activity and its effectiveness in monitoring and disciplining its activities. It reduces the information asymmetry issue (Al-Yahyaee and Al-Hadi, 2016) and thus enhances the board's monitoring activities. Brick and Chidambaran (2010) claim that corporate boards are likely to increase their activities and effectiveness through frequent meetings. Similarly, the literature reveals that board meeting frequency is positively associated with the succession of monitoring activities (García et al., 2011), disclosure of voluntary information (Banghøj and Plenborg, 2008), and improvement of corporate performance (Fich and Shivdasani, 2005). However, it has been revealed that board meeting frequency negatively impacts earnings announcements (Kanagaretnam et al., 2007).

There is an absence of research investigating the impact of board meetings on risk disclosure. Given the UK's strong corporate governance system, the current study is aligned with the significant role of board meetings in improving the board's monitoring activity and effectiveness in reducing information asymmetry issues. This may enhance not only corporate levels of voluntary disclosure but also the provision of voluntary risk information. Consequently, we posit the following:

H[2]: Firms with more frequent board meetings are likely to provide more VRSKD.

2.3 The independence of corporate boards and VRSKD

Board independence reflects the board's autonomy by including external directors on the board to enhance its presence as an internal monitoring mechanism (Jensen, 1993). Independent directors provide a significant controlling role on behalf of corporate shareholders, more than do executive board members (Akhtar et al., 2018; Hassanein and Kokel, 2019). Therefore, they tend to mitigate information asymmetry (Kanagaretnam et al., 2007) as well as agency conflicts between corporate directors and shareholders (Fama and Jensen, 1983). Consequently, independent boards would be more likely to enhance the level of corporate transparency.

The prior literature has found mixed outcomes regarding the effect of board independence on corporate disclosure. On the one hand, a positive impact is reported between board independence and different sorts of disclosures such as forward-looking (Wang and Hussainey, 2013; Hossain et al., 2005) and intellectual capital (Li et al., 2008)). On the other hand, negative relationships are found between board independence and overall voluntary disclosure (Eng and Mak, 2003), earnings announcements (Kanagaretnam et al., 2007), and corporate social disclosure (Haniffa and Cooke, 2005). Likewise, positive (Elshandidy et al., 2013) and negative (Wang et al., 2019) relationships are reported between corporate board independence and the disclosure of risk information. In the UK, independent directors are less expected to be aligned with the firm's managers. Subsequently, they are likely to carry out perceived monitoring and disciplining roles (Wang and Hussainey, 2013). This may induce the corporate managerial team to disclose more risk information voluntarily, which would be reflected in lower information asymmetry. Thus, we posit the following:

H_3: Firms with more independent directors are likely to provide more VRSKD.

2.4 The dual role of corporate CEOs and VRSKD

Agency theory posits that a combination of CEO and chairperson duties (hereafter CEO duality) is a concern to the independent judgment of the corporate board since such managerial behaviour reduces the quality of board monitoring activities (Jensen, 1993) and, in turn, reflects inconsistency with the shareholders' interests. Brockmann et al. (2004) argue that CEO duality is likely to lead to self-serving actions when assessing management quality. This desire for self-entrenchment is highly expected to influence the quality of corporate disclosure. Nevertheless, CEO duality potentially leads to some benefits, including the CEO's ability to act rapidly and make timely judgments, consistent with Brickley et al. (1997).

Prior research argues that CEOs who act as chairpersons of corporate boards may be less likely to share corporate information with outsiders due to their desire for self-entrenchment (Brockmann et al., 2004). Empirical research consistently reports that corporate directors are less likely to disclose voluntary information in the presence of CEO duality (Balachandran and Raff, 2015; Ho and Wong, 2001). However, other research finds no effect of CEO duality on disclosing voluntary information (Li et al., 2008). To our best knowledge, no previous research has revealed a positive link between CEO duality and voluntary disclosure. Specifically, there is no research examining how CEO duality affects voluntary risk information disclosure.

Hence, we expect CEO duality to negatively affect VRSKD due to the self-serving actions of a firm's CEO when duality roles exist. Therefore, this study sets out the following:

H4: Firms with CEO duality are likely to provide less VRSKD.

2.5 Managerial ownership and VRSKD

Two contradictory perspectives have been developed regarding the influence of managerial ownership on voluntary disclosure. On the one hand, the agency perspective argues that managerial ownership mitigates agency costs because it helps align corporate directors' interests with those of its investors (Fama and Jensen, 1983). Consequently, information asymmetry is lower in corporations with higher managerial ownership, and they are therefore eager to provide more voluntary risk information. On the other hand, the management entrenchment perspective argues that corporate directors with substantial ownership of corporate shares are more likely to feel that their positions are secure and consequently would be expected to maximize their private benefits. This leads to agency problems and information asymmetry (Hassanein and Hussainey, 2015) and, in turn, lower likelihood of voluntary risk disclosure.

Prior empirical studies suggest that the management entrenchment hypothesis is more prominent than the agency perspective regarding the influence of managerial ownership on voluntary information. They document a negative effect of managerial ownership on overall voluntary disclosure (Eng and Mak, 2003) and different types of voluntary information such as forward-looking disclosure (Wang and Hussainey, 2013; Hussainey and Al-Najjar, 2011), intellectual capital information (Li et al., 2008), and risk disclosure (Wang et al., 2019). Consistent with UK studies on voluntary disclosure (e.g., Wang and Hussainey), we believe that a high level of corporate managerial ownership would negatively affect VRSKD. When executives hold a substantial number of shares, this enhances their power to maximize their benefits, leading to less disclosure of voluntary risk information. Hence, we posit the following:

H5: Firms with higher managerial ownership are likely to provide less VRSKD.

2.6 The size of corporate audit committees and VRSKD

The audit committee within a corporation has a critical role in mitigating agency conflicts by enhancing quality through improving board monitoring activities (Klein, 2002). Firms with audit committees have a low risk of facing lawsuits due to reduced conflicts of interests between directors and investors (Krishnan and Lee, 2009). The roles of an audit committee

include reviewing the corporate internal control system and its risk management system. It is therefore crucial for corporations to be effective in exercising monitoring and disciplinary activities. The Cadbury Report (1992) suggests that at least three members on a corporate audit committee would increase the efficacy of its monitoring. Corporations with larger audit committees are expected to have the advantages of a diversity of knowledge and expertise (Hassanein and Kokel, 2019). However, an excessively large audit committee could decrease its effectiveness due to the diffusion of members' roles (Beasley et al., 2009).

Prior research suggests that audit committee size is a suitable governance mechanism that plays an effective role in allowing outsiders to verify financial statements' validity and deterring earnings management (Balachandran and Raff, 2015). Most importantly, corporate audit committees positively affect overall voluntary disclosure (Ho and Wong, 2001) and forward-looking disclosure in the UK (Al-Najjar and Abed, 2014) and Australia (O'Sullivan et al., 2008). On the other hand, Klein (2002) finds that corporations with larger audit committees are expected to have less voluntary disclosure. Corporate audit committees in the UK are characterized by more diversity of expertise in exercising monitoring activities. Subsequently, they would be more likely to provide VRSKD. Therefore, this study posits the following:

H_6: Firms with larger audit committees are likely to provide more VRSKD.

2.7 VRSKD, firm-level governance, and firm value

Agency theory suggests that voluntarily disclosing information reduces information asymmetry and agency costs and therefore the uncertainty surrounding corporate risks. At the same time, future firm performance will be increased, which is subsequently reflected in firm value. Likewise, voluntary disclosure enhances the perceptions of corporate investors, which will then be reflected in corporate valuation (Healy et al., 1999). Furthermore, voluntary disclosure may reduce corporate management and any private benefits that investors may receive from controlling the firm. This leads to enhancing investors' expectations of cash flow and firm value. Consistently, empirical research reports that providing forward-looking information enhances firm value in the US (Kim and Shi, 2011) and the UK (Hassanein et al., 2019).

Fama and Jensen (1983) suggest that good corporate FL_G mechanisms regulate managers' opportunistic behaviour and hence mitigate conflicts between corporate managers and their shareholders. Thus, firm value is more likely to be enhanced. For example, prior research reports that firm value is related positively to a larger board size (Haj-Salem et al., 2020),

percentage of independent directors on the board (Wang et al., 2019), percentage of managerial ownership (Elsayed and Elbardan, 2018), and board meetings (Brick and Chidambaran, 2010). Alternatively, other studies find that firm value is influenced negatively by board size (Bennouri et al., 2018), board independence (Erkens et al., 2012), and dual roles of a firm CEO (Bhagat and Bolton, 2002).

Very little literature has tested the relationship between corporate governance and the value relevance of disclosure. For instance, Wang and Hussaieny (2013) report that a good corporate governance system discloses value-relevant, voluntary, forward-looking information to forecast forthcoming earnings. Moreover, Katmon and Al Farooque (2017) find that firms with a sound governance system provide high-quality information that increases corporate transparency and mitigates information asymmetry. In contrast, Haj-Salem et al. (2020) use a sample from Tunisian firms for 2008-2013 to find a substitution effect of corporate governance and risk disclosure on firm value. This suggests that a firm may enhance its value through either its strong corporate governance mechanism or disclosure of risk information. The results of Haj-Salem et al. (2020) are not logically acceptable as transparency (i.e., disclosing more information) is one of the principles of corporate governance and it is therefore not logical that corporate governance and disclosure could be substitutes for each other. Based on the above discussion, we suggest that VRSKD of firms with good governance should be more informative to investors and subsequently enhances their valuation of these firms. Thus, the current study posits the following:

> H_7: The VRSKD of firms with better FL_G is likely to increase the value of those firms.

3. Methodology

3.1 Sample

For our analysis, we use the UK firms listed on the London Stock Exchange FTSE350 index from 2010 to 2015. We start the analysis in 2010, after the global financial crisis, and end it in 2015, before the UK voted to leave the European Union. The study uses the firms' annual reports to calculate a voluntary risk disclosure score because they are still widely used and considered prominent data sources for shareholders, potential investors, and financial analysts (Beattie et al., 2004). The preliminary sample consists of 2106 observations. Before running the analyses, we exclude 588 observations for all financial firms because of their specific

accounting regulations. Furthermore, the measurement of disclosure scores requires converting the PDF annual reports into text files. Thus, 52 observations of annual reports that were impossible to convert into texts are excluded from the sample of firms. Additionally, 62 observations with missing financial data or data on FL_G mechanisms are excluded. Another 16 observations are omitted from the analysis as a result of firms changing their year-ending month during the sample period. Thus, our final sample comprises 1388 firm-year observations as distributed over the years and industries, respectively, in Panels A and B of Table 1. The annual reports of UK firms are manually downloaded from their official websites. The FL_G variables are collected through DataStream and Bloomberg, while financial data are obtained from DataStream.

Insert Table 1

3.2 Measuring voluntary risk disclosure

The score of a firm's VRSKD is measured using automated content analysis. The following steps are taken:

First, we extract the corporate-level risk statements from the firm's annual report using a list of risk-related keywords. We create these risk-related keywords according to previous studies on risk disclosure (e.g., Elshandidy et al., 2015; Elshandidy and Neri, 2015) and after reading 50 annual reports. Our list of risk-related keywords includes: risk, loss, fluctuate, differ, diversify, probable, threat, verse, reverse, against, catastrophe, shortage, unable, challenge, uncertain, chance, peak, decline, low, increase, decrease, less, fail, failure, significant. We restrict the search in the annual reports to include derivatives of the search's original keywords. Instead of searching for statements containing only the keyword "loss", we search for statements that include any derivative such as "loss, losses, lost, loser." We use the Nudist 6 QSR application to search the annual reports for sentences with at least one of the risk-related keywords (and their derivatives). This leads to a count of all the sentences with at least one relevant risk-related keyword, thus representing the *corporate* risk disclosure level.

Second, we extract the mandatory risk sentences from the annual reports. The mandatory risk disclosure topics are identified based on UK GAAP and international accounting standards, as suggested by Elshandidy et al. (2015). These include contingencies, segment reporting, foreign exchange transactions, the substance of transactions or investments, related-party disclosures, and derivatives. We develop a command file on the Nudist 6 QSR application to search annual

reports for statements that include both a risk-related keyword and a mandated risk topic; the number of these sentences represents the *mandatory* risk disclosure level.

Finally, the VRSKD score is the *corporate* risk disclosure score (as measured in the first step) after excluding the *mandatory* risk disclosure score (as measured in the second step).

To assess the reliability of the automated measurement of the VRSKD score, we manually coded a randomly selected sample of 50 annual reports. All statements in each annual report are read carefully to identify the risk sentences. We define risk statements as any statement concerning the firm's risks. Then, each risk statement is carefully read to determine its basic aspect. If the statement's element is related to one of the mandated risk topics or themes, then the statement is classified as a mandatory risk disclosure. If not, it is classified as a voluntary risk disclosure. Afterward, we compare the risk scores from the automated and manual codings using correlation analysis. It demonstrates both scores are significantly correlated (P< 0.05), implying that our automatic measure for voluntary risk disclosure is reliable.

3.3 Regression models

3.3.1 FL_G mechanisms impact on VRSKD

In the regression model, we control for the following firm characteristics that prior studies have found to be determinants of voluntary disclosure: firm size (Campbell et al., 2014), profitability (Chavent et al., 2006), liquidity (Elshandidy et al. 2013; Elzahar and Hussainey, 2012), leverage (O'Sullivan et al., 2008), and dividends (Wang and Hussainey, 2013). We also use year and industry fixed effects to control for variations in VRSKD over years and industries, respectively.

We develop model (1) to test the hypotheses addressing the impact of FL_G mechanisms on the VRSKD score.

$$
\begin{aligned}
VRSKD_{it} = {} & \beta_0 + \beta_1 BRD\_S_{it} + \beta_2 BRD\_MT_{it} + \beta_3 BRD\_IND_{it} + \beta_3 CEO\_D_{it} \\
& + \beta_4 OWNER\_MGMT_{it} + \beta_5 AUDT\_COMT_{it} + \beta_6 F\_SIZE_{it} + \beta_7 F\_PRFT_{it} \\
& + \beta_8 F\_LQ_{it} + \beta_9 F\_LV_{it} + \beta_{10} F\_DVDNT_{it} + \beta_{11} YFE + IFE + \varepsilon
\end{aligned}
\quad (1)
$$

where $VRSKD_{it}$ represents the voluntary risk disclosure score, as measured in section 3.2. *BRD_S, BRD_MT, BRD_IND, CEO_D, OWNER_MGMT,* and *AUDT_COM* are the FL_G mechanisms. *F_SIZE, F_PRFT, F_LQ, F_LV,* and *F_DVDNT* are the firm-specific

characteristics control variables. *YFE* and *IFE* represent the year and industry fixed effects, respectively. The variables' definitions and measurements are presented in Table 2.

3.3.2 Effect of voluntary disclosure and FL_G mechanisms on firm value

To examine how FL_G affects the relationship between VRSKD and the value of a firm, we add, in the regression models, some variables that impact the value of a firm, including firm size (Hassan et al., 2009), profitability (Hassanein et al., 2019), liquidity (Liu et al., 2010), leverage (Mangena et al., 2012), dividends (Arnott and Asness, 2003), and capital expenditures (Mangena et al., 2012). We also add year and industry fixed effects to control for variations in corporate value over years and industries, respectively.

To test how VRSKD and the FL_G mechanism affect the value of a firm, first, we develop model (2), where we regress the firm value on VRSKD, FL_G mechanisms, and control variables as follows:

$$
\begin{aligned}
Firm\_Value_{it} = \ & \beta_0 + \beta_1 VRSKD_{it} + \beta_2 BRD\_S_{it} + \beta_3 BRD\_MT_{it} \\
& + \beta_4 BRD\_IND_{it} + \beta_5 CEO\_D_{it} + \beta_6 OWNER\_MGMT_{it} + \beta_7 AUDT\_COMT_{it} \\
& + \beta_8 F\_SIZE_{it} + \beta_9 F\_PRFT_{it} + \beta_{10} F\_LQ_{it} + \beta_{11} F\_LV_{it} \\
& + \beta_{12} F\_DVDNT_{it} + \beta_{13} CAPEXPTR_{it} + IFE + YFE + \varepsilon
\end{aligned}
\tag{2}
$$

where $Firm\_Value_{it}$ is the value of firm *i* at year *t* within 3 months of the annual report date. We have used Tobin's Q ratio after adjustment for industry median (hereafter, IMATQ) as a proxy for the value of a firm. This indicator mitigates the bias arising from the industry and leads to a reliable estimate of the residual (Bebchuk et al., 2009). It is measured as the Tobin's Q ratio of the firm after excluding the median value of Tobin's Q in its industry. The definitions of variables are explained in Table 2.

Second, to examine the effect of VRSKD by well-governed firms on the value of a firm, we develop Model (3), which includes interaction variables between VRSKD and the FL_G mechanisms.

$$
\begin{aligned}
Firm\_Value_{it} = \ & \beta_0 + \beta_1 VRSKD_{it} + \beta_2 BRD\_S_{it} + \beta_3 BRD\_MT_{it} \\
& + \beta_4 BRD\_IND_{it} + \beta_5 CEO\_D_{it} + \beta_6 OWNER\_MGMT_{it} + \beta_7 AUDT\_COMT_{it} \\
& + \beta_8 VRSKD_{it} \ x \ BRD\_S_{it} + \beta_9 VRSKD_{it} \ x \ BRD\_MT_{it} \\
& + \beta_{10} VRSKD_{it} \ x \ BRD\_IND_{it} + \beta_{11} VRSKD_{it} \ x \ CEO\_D_{it} \\
& + \beta_{12} VRSKD_{it} \ x \ OWNER\_MGMT_{it} + \beta_{13} VRSKD_{it} \ x \ AUDT\_COMT_{it} \\
& + \beta_{14} F\_SIZE_{it} + \beta_{15} F\_PRFT_{it} + \beta_{16} F\_LQ_{it} + \beta_{17} F\_LV_{it} \\
& + \beta_{18} F\_DVDNT_{it} + \beta_{19} CAPEXPTR_{it} + IFE + YFE + \varepsilon
\end{aligned} \tag{3}
$$

where $VRSKD_{it} \ x \ BRD\_S_{it}$ is an interaction variable between VRSKD and size of the board of directors, $VRSKD_{it} \ x \ BRD\_MT_{it}$ is an interaction variable between VRSKD and frequency of board meetings, $VRSKD_{it} \ x \ BRD\_IND_{it}$ is an interaction variable between VRSKD and board independence, $VRSKD_{it} \ x \ CEO\_D_{it}$ is an interaction variable between VRSKD and role duality of the CEO, $VRSKD_{it} \ x \ OWNER\_MGMT_{it}$ is an interaction variable between VRSKD and the percent of managerial ownership, and $VRSKD_{it} \ x \ AUDT\_COMT_{it}$ is an interaction variable between VRSKD and the size of the audit committee.

Insert Table 2

4. Findings

4.1 Descriptive statistics and univariate analysis

Table 3 shows the descriptive statistics for the variables: The natural logarithm of VRSKD ranges from approximately 1.579 to 4.121. This implies a variation in voluntary risk information among UK firms. On average, UK firms have a VRSKD score of 3.329 in their annual reports. The average corporate UK value, measured using the IMATQ, is 0.468, and it ranges from -2.737 to 35.734, suggesting variations in the values of firms listed on the FTSE350 index.

Regarding descriptive statistics of FL_G mechanisms, the size of the corporate board is, on average, 9.033 directors. UK corporate boards hold, on average, 8.505 meetings per year. The average value of board independence in UK corporate boards is approximately 48.607%. This percentage ranges from 0.00.to 84.962. Also, approximately 88% of CEOs in FTSE350 firms

combine both CEO and chairperson roles. The percentage of managerial ownership is, on average, 6.493% of the shares of the firm. The size of audit committees ranges from 2.00 to 15.00 with a mean value of 4.137 members.

For our firm-specific characteristics control variables, the average size (profitability) of a firm is 6.937. (30.479). This suggests that FTSE350 firms were relatively profitable during 2010-2015. The mean value of firm liquidity is 1.440, and the mean value of leverage is 33.073. Also, the sample firms have an average dividend yield value of 2.901 and capital expenditures, as percentage of assets, of 0.041. These values suggest variations among the characteristics of the sample firms.

Insert Table 3

The Pearson correlation matrix is displayed in Table 4 and provides evidence that VRSKD is significantly related to certain FL_G mechanisms. Specifically, it is positively correlated with the size of the board of directors (BRD_S), percentage of independent directors (BRD_IND), and audit committee size (AUDT_COMT). However, VRSKD is negatively correlated with the frequency of board meetings (BRD_MT) and percentage of managerial ownership (OWNER_MGMT). These results suggest that FL_G mechanisms induce corporate managers to disclose (or not disclose) voluntary risk information. Besides, the VRSKD score is positively related to the proxy of firm value (IMATQ). This suggests that corporations disclosing more risk information voluntarily exhibit higher values. Furthermore, VRSKD is associated with some firm-specific characteristics. It is positively related to firm size (F_SIZE), firm (F_LQ), and dividends (F_ DVT). These significant correlations between VRSKD score and firm-specific characteristics add some validity to our disclosure measure, as indicated in prior studies (Hassanein et al., 2019).

Furthermore, the correlation coefficients can be utilized to show the presence of multicollinearity issues among variables. It is indicated that multicollinearity exists if the correlation coefficients are greater than 0.80 (Gujarati and Porter, 2008). Our results reveal that the coefficients of Pearson correlation are less than 0.80, indicating no multicollinearity issues in our data.

Insert Table (4)

4.2 Regression results

4.2.1 FL_G impact on VRSKD

Table 5 reports the parameters of Model (1), testing the hypotheses about the effect of FL_G mechanisms on VRSKD (i.e., H_1, H_2, H_3, H_4, H_5, and H_6). Panel [1] shows the results from regressing VRSKD on control variables only, without considering the impact of FL_G mechanisms. Panel [2] shows the results after additionally considering the FL_G mechanisms. The model is statistically significant (P<.01). The R^2 value is 49.748% in panel [1] and increases to 63.193% in panel [2], implying that FL_G mechanisms explain some of the variations in VRSKD in FTSE350 corporations. In the regression tables, the t-statistics are displayed in brackets under the coefficients.

The estimation results indicate that BRD_S has a negative and significant impact on VRSKD (β = -1.138; t = -2.388). This does not support H_1, that firms with larger board sizes are like to provide more voluntary risk disclosure but is consistent with the view that larger boards lack the effectiveness to monitor managerial activities because of a lack of coordination among board members (Boubakri et al., 2013; Bokpin et al., 2011). This is a similar finding to Elgammal et al. (2018), who find an inverse impact of board size on the disclosure of voluntary information in Qatar. BRD_MT is not statistically significant with VRSKD at any level (β = -0.461; t = -0.937). This leads to rejecting H_2, implying that the frequency of board meetings does not affect voluntary risk disclosure. This is not consistent with the literature finding that board meetings have a positive relationship on the succession of performing monitoring activities (García et al., 2011), and thus help to enhance voluntary disclosure by firms (Banghøj and Plenborg, 2008).

On the other hand, BRD_IND positively affects VRSKD at a significance level of 1% (β = 1.862; t = 3.904), supporting H_3. This result can be explained in that independent board members act as a strong mechanism that helps in reducing information asymmetry (Jensen, 1993; Fama and Jensen, 1983; Kanagaretnam et al., 2007) and increasing corporate disclosures. It adds to prior research reporting a positive relationship between board independence and voluntary disclosure (Li et al., 2008; Wang and Hussainey, 2013; Hussainey and Al-Najjar, 2011). In terms of CEO_D, it does not significantly impact VRSKD at any level (β = -0.125, t = -0.911). This leads us to reject H_4. This is consistent with the view that having one person dominating the board can reduce its monitoring quality (Jensen, 1993; Fama and Jensen, 1983) and consequently would make it less likely to share corporate information with outsiders due

to the desire of self-entrenchment (Brockmann et al., 2004). This desire for self-entrenchment potentially reduces the dissemination of VRSKD.

Turning to OWNER_MGMT, it negatively affects VRSKD at the 5% level (β = -1.417; t = -2.126), suggesting that firms with higher managerial ownership are less likely to provide VRSKD. This supports H_5. It also supports the management entrenchment hypothesis that when corporate management holds substantial portions of corporate shares, they are more likely to feel that their positions are secure as their private benefits are maximized. As a result, this leads to agency problems and therefore reduces voluntary disclosure. The results align with previous research on different areas of disclosure (Eng and Mak, 2003; Hussainey and Al-Najjar, 2011; Li et al., 2008). The results also indicate that AUDIT positively affects VRSKD (β= 1.974, t = 3.038). This supports H_6 that firms with larger audit committees are likely to disseminate more VRSKD. This supports the idea that audit committees have a diversified knowledge base and are vital in improving the monitoring quality of corporate boards (Karamanou and Vafeas, 2005). It also supports prior research reporting the positive effect of audit committee size on the disclosure of voluntary information (e.g., Al-Najjar and Abed, 2014; O'Sullivan et al., 2008; Karamanou and Vafeas, 2005; Ho and Wong, 2001).

Turning to firm-specific characteristics control variables, the empirical results suggest that larger corporations are likely to provide more VRSKD, consistent with previous studies (e.g., Campbell et al., 2014). Likewise, the results support findings that highly liquid firms are likely to provide more risk disclosures to signal their abilities to manage their risks effectively (e.g., Elshandidy et al. 2013; Elzahar and Hussainey, 2012). Moreover, VRSKD is positively affected by firm dividends, which is consistent with the notion that higher dividend payments may mean that firms are compensating their shareholders for their high risk levels (Wang and Hussainey, 2014). The results suggest no significant impact of firm profitability and leverage ratios on VRSKD.

Insert Table 5

4.2.2 VRSKD, FL_G, and firm value

Table 6 presents the estimation results to test H_7, which proposes that the VRSKD of better-governed firms is more likely to enhance their value. In Panel [1], we show the results of Model (2) where we regress the proxy of firm value (IMATQ) on VRSKD, FL_G, and control variables. Panel [2] shows the parameters of Model (3), which includes the interaction variables

between VRSKD and the mechanism of FL_G to test their joint effect on IMATQ. Models (2) and (3) are statistically significant (P<.01). The R^2 value is 32.419% in model (2) and increases to 37.816% in model (3), implying good overall model fit that explains variations in the values of FTSE350 corporations. The t-statistics are presented in parentheses under the coefficients.

The coefficients of VRSKD are 2.194 (t = 4.677) in Model (2) and 1.763 (t = 3.598) in Model (3). This suggests that VRSKD positively enhances the value of FTSE350 corporations. This is in line with the view that risk disclosure helps shareholders to develop their expectations regarding the firms' future cash flows, risks, and returns, which impacts their value. Additionally, it meets the agency perspective expectation that risk disclosure will decrease the information asymmetry between corporate directors and shareholders. This then decreases ambiguity surrounding corporate risks and uncertainties, which influences share price and, in turn, value. In addition, voluntarily disclosing risk information decreases the private benefits that corporate management and investors may receive from controlling the firm, which are reflected later in increased investor expectations of cash flows and thus firm value. The findings are similar to the results of previous studies that argue that disclosure of voluntary information is reflected directly in firm value (e.g., Hassan et al., 2009; Elzahar et al., 2015; Hassanein et al., 2019).

The estimation results show uneven effects of the FL_G mechanism on the values of FTSE350 firms. On the one hand, firm value is seen as a positive function of corporate board independence and its audit committee size. This reveals that a larger percentage of independent directors and larger audit committees serve to positively influence the value of FTSE350 firms. On the other hand, firm value is seen as a negative function of its managerial ownership. This implies that FTSE350 firms with greater managerial ownership exhibit lower value. The results complement prior empirical literature supporting the positive consequences of FL_G mechanisms on corporate value (Wang et al., 2019).

Panel [2] of Table 6 shows the findings of Model (3). It reveals that VRSKD x BRD_S has no statistically significant relationship (β = -0.003; t = -0.870) with IMATQ. Likewise, VRSKD x BRD_ MT has no statistically significant relationship (β = 0.002; t = 0.940) with IMATQ. Furthermore, VRSKD x CEO_D has no statistically significant relationship (β = -0.010; t = -0.691) with IMATQ. These results suggest that corporate board size, frequency of board meetings, and role duality of a firm CEO do not affect the positive association between VRSKD and the value of FTSE350 firms.

On the other hand, VRSKD x BRD_IND has a statistically significant relationship at the 10% level ($\beta = 0.071$; t = 1.686) with IMATQ. This indicates that independent directors on a firm's board increase the positive association between VRSKD and corporate value. Furthermore, VRSKD x OWNER_MGMT has a statistically significant relationship at the 5% level ($\beta = -0.009$; t = -2.235) with IMATQ, which indicates that ownership by management decreases the association between VRSKD and corporate values. Moreover, VRSKD x AUDT_ COMT has a statistically significant relationship at the 1% level ($\beta = 0.011$; t = 2.823) with IMATQ, which implies that larger audit committees enhance the positive association between future-oriented disclosure and corporate value.

The results suggest that firms with strong FL_G mechanisms disclose more value-relevant voluntary risk information for their shareholders to better assess their corporate value. This partially supports the H_7 hypothesis that voluntary risk disclosure of better-governed firms is more likely to enhance corporate value. Specifically, the results suggest that voluntary risk disclosure of firms with more independent directors, smaller managerial ownership, and/or larger audit committees are likely to enhance their value. These results complement the findings of Wang and Hussaieny (2013) that the voluntary disclosure of future-oriented information of well-governed UK firms is value-relevant to shareholders. However, they are not consistent with Haj-Salem et al. (2020), who find a substitution impact of corporate governance and corporate risk disclosure on the value of Tunisian firms.

Insert Table 6

5. Sensitivity analysis

To check the results' robustness, we use another proxy for firm value: the ratio of a firm's market value of equity to its book value (M-B). M-B is utilized in some prior research to measure firm value (for example, Hassan et al., 2009). We measure M-B by multiplying the number of outstanding shares of a firm by the mean value of its share price within 3 months of the release date of a firm's annual report.

We re-run Models (2) and (3) using M-B as a dependent variable. Table 7 presents the estimated parameters of the models. Both models are statistically significant (P<.01). The R^2 value is 33.174% for model (2) and increases to 39.493% in model (3). This indicates good overall model fit that explains variations in the values of FTSE350 corporations. The t-statistics are presented in parentheses under the coefficients.

The coefficients of VRSKD on M-B are 2.747 (t = 3.514) in Model (2) and 1.921 (t = 3.856) in Model (3). These suggest that VRSKD positively enhances the values of firms. The results are uneven in terms of the effect of the FL_G mechanism on firm value. They indicate that a firm's value is positively (negatively) influenced by board independence (managerial ownership) and the size of the audit committees. Furthermore, the interaction between VRSKD and FL_G mechanisms suggests that board independence and size of the audit committee increase the effect of voluntary risk disclosure on firm value. However, managerial ownership decreases this relationship. The results are consistent and similar to the main analyses described in section 4.2.2.

Insert Table 7

6. Conclusion and implications

We use a sample from the UK FTSE350 firms over the period 2010-2015 to investigate the effect of FL_G mechanisms on the disclosure of voluntary risk information and to examine how FL_G affects the association between VRSKD and firm value. The empirical analyses provide the following insights: First, the disclosure of voluntary risk information is affected positively by the percentage of independent directors and the audit committee size. However, it is negatively influenced by the size of the board and the percentage of managerial ownership. Second, using the industry median adjusted Tobin's Q ratio and, alternatively, the ratio of the market value of equity to its book value as indicators of firm values, we provide evidence that voluntary risk disclosure enhances investors' valuations of firms. Besides, firm value is positively affected by board size, board independence, and audit committee size, while it is negatively affected by managerial ownership. Finally, voluntary risk disclosure enhances the value of FTSE350 firms, especially in the presence of more independent directors, smaller managerial ownership, and/or larger audit committees. The results support agency theory, in which corporate managers are encouraged to disclose relevant voluntary risk information for use in the decision-making process, which then would be reflected in increased firm value.

Our results, overall, have implications for UK investors and policy-setters. First, the results draw attention to the interrelations between VRSKD, firm-level governance, and value in the FTSE350 index in the UK, an efficient, developed market. Second, the UK's policy-setters should consider the importance of firm-level governance, namely board size, board independence, managerial ownership, and audit committees, to increase the transparency of

UK firms (i.e., more voluntary risk disclosure). Thus, shareholders looking for more transparent corporations would be likely to invest in firms with smaller board sizes, more independent directors, less managerial ownership, and larger audit committees. Third, the results provide evidence on the impact of VRSKD on firm value, which may lead policy-setters to motivate corporations to provide more voluntary risk information to enhance the quality of information contained in their annual reports and thus enhance shareholders' valuation of those firms. Fourth, the results provide empirical evidence that firm-level governance mechanisms are likely to enhance the positive association between voluntary risk disclosure and corporate values. Shareholders might therefore be well-served to depend on such mechanisms (i.e., firms with more independent directors, less managerial ownership, and larger audit committees) to form their expectations regarding firm value.

Some limitations can be noted in the study, which could be addressed in future research. First, the current study focuses on FTSE350 listed firms in the UK. The findings of this study, therefore, may not be generalized to other contexts. For instance, investigating the listed companies in an emerging economy such as Brazil or Russia, using the same research design, could be a potential research area. Besides, expanding the research design to consider the impact of country characteristics on the informativeness of VRSKD may be another possible area for future research. Second, we utilize annual reports as a source of VRSKD data in the current study. Other sources, such as online reporting, board meeting minutes, financial analysts' reports, and press releases could be an avenue for future research. Third, considering other indicators such as share-based remuneration packages and managers' characteristics (e.g., age, gender & tenure) and examining their influence on VRSKD and/or firm value may be a promising area for research.

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List of Tables

Table 1: Sample

Panel A: Allocation over years		
Years	Frequency	%
2010	218	15.706%
2011	226	16.282%
2012	232	16.715%
2013	234	16.859%
2014	236	17.003%
2015	242	17.435%
Total	1388	100.000%

Panel B: Allocation over industries		
Industries	Frequency	%
Oil and gas	64	4.611%
Basic materials	112	8.069%
Industrial	436	31.412%
Consumer goods	134	9.654%
Health care	84	6.052%
Consumer services	318	22.911%
Telecommunication	16	1.153%
Utilities	28	2.017%
Technology	196	14.121%
Total	1388	100.000%

This Table displays the sample observations and their distributions over years and industries.

Table 2: Variables

Variables	Labels	Measurements
Voluntary risk disclosure score	VRSKD	The voluntary risk disclosure score is the natural logarithm of all risk statements in a firm annual report after excluding the mandatory risk statements. See section 3.2
Firm value	IMATQ	The industry median adjusted Tobin's Q ratio after 3-months of the annual report date. The Tobin's Q = [(total debt + market value of equity) / book value of total assets]. Market value of equity is number of outstanding shares multiplied by the mean of the stock prices after 3-months of the annual report date
	M-B	The ratio of market value of equity to its book value as per prior research (Hassan et al., 2009).
Board size	BRD_S	Number of members of a firm board of directors as identified in the annual report at the end of the year.
Board meetings	BRD_MT	Number of meetings of a firm board of directors held within the current year
Board independence	BRD_IND	Percent of independent directors in the board to the total number of board members
CEO duality	CEO_D	Dummy variable that takes 1 if the CEO of the firm is the board chairman and 0 otherwise.
Managerial ownership	OWNER_MGMT	Percent of shares owned by executive members of a firm management to the total shares outstanding
Audit committee	AUDT_COMT	Number of members of a firm audit committee.
Firm size	F_SIZE	Natural logarithm of a firm total assets at the end of the current year.
Profitability	F_PROFT	A firm net income divided by its stockholders' equity at the end of the current year
Liquidity	F_LQ	A firm current asset divided by its current liabilities at the end of the current year
Leverage	F_LV	A firm total debt divided by its equity at the end of the current year
Dividends	F_DVDNT	A firm dividend divided by its stock price at the end of the current year.
Capital expenditure	CAPEXPTR	A firm capital expenditure divided by its total assets

This Table presents the measurements of all variables.

Table 3: Descriptive statistics

	Obs.	Mean	Std. Dev.	Min	Max.
VRISK	1388	3.329	0.253	1.579	4.121
IMATQ	1388	0.468	0.604	-2.737	35.734
M-B	1388	3.792	19.506	-27.589	80.041
BRD_S	1388	9.033	2.255	3.000	21.000
BRD_MT	1388	8.505	2.790	2.000	26.000
BRD_IND	1388	48.607	13.662	0.000	84.962
CEO_D	1388	0.879	0.024	0.000	1.000
OWNER_MGMT	1388	6.493	11.770	0.000	68.050
AUDT_COMT	1388	4.137	1.369	2.000	15.000
F_SIZE	1388	6.937	0.576	5.594	8.482
F_PROFT	1388	30.479	12.413	-100.730	197.850
F_LQ	1388	1.440	1.238	0.210	12.310
F_LV	1388	33.073	29.959	-25.037	62.891
F_DVDNT	1388	2.901	1.723	0.000	8.250
CAPEXPTR	1388	0.041	0.039	0.000	0.414

This Table displays the descriptive statistics of all variables.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) VRSKD	1														
(2) IMATQ	0.427***	1													
	(0.000)														
(3) M-B	0.460***	0.619***	1												
	(0.000)	(0.000)													
(4) BRD_S	0.270***	0.360***	0.321***	1											
	(0.000)	(0.000)	(0.000)												
(5) BRD_MT	-0.051	0.013	-0.037	-0.052	1										
	(0.297)	(0.787)	(0.436)	(0.268)											
(6) BRD_IND	0.338***	0.489***	0.459***	0.681***	0.002	1									
	(0.000)	(0.000)	(0.000)	(0.000)	(0.972)										
(7) CEO_D	0.058	0.142***	-0.119**	-0.030	-0.017	0.094**	1								
	(0.231)	(0.002)	(0.011)	(0.523)	(0.710)	(0.043)									
(8) OWNER_MGMT	-0.173***	-0.098**	-0.102**	-0.129**	0.058	-0.205**	-0.169**	1							
	(0.000)	(0.035)	(0.031)	(0.015)	(0.214)	(0.021)	(0.018)								
(9) AUDT_COMT	0.284**	0.340***	0.225**	0.379***	0.134***	0.451***	0.146***	-0.118**	1						
	(0.023)	(0.000)	(0.028)	(0.000)	(0.004)	(0.000)	(0.002)	(0.011)							
(10) F_SIZE	0.505***	0.799***	0.658***	0.517***	-0.053	0.583***	0.094**	-0.216**	0.304***	1					
	(0.000)	(0.000)	(0.000)	(0.000)	(0.261)	(0.000)	(0.044)	(0.015)	(0.000)						
(11) F_PRFT	0.029	-0.003	0.023	0.038	0.017	-0.004	0.039	-0.014	0.019	-0.026	1				
	(0.560)	(0.942)	(0.628)	(0.428)	(0.726)	(0.930)	(0.419)	(0.763)	(0.692)	(0.589)					
(12) F_LQ	0.137***	-0.115**	0.202***	-0.192**	0.021	-0.178**	-0.330**	-0.006	-0.158**	-0.141**	-0.034	1			
	(0.005)	(0.014)	(0.005)	(0.037)	(0.655)	(0.046)	(0.019)	(0.896)	(0.021)	(0.031)	(0.473)				
(13) F_LV	0.002	0.069	0.001	0.105**	-0.022	0.042	-0.004	0.035	0.034	0.091*	0.049	-0.063	1		
	(0.973)	(0.138)	(0.992)	(0.025)	(0.644)	(0.375)	(0.932)	(0.456)	(0.464)	(0.054)	(0.307)	(0.178)			
(14) F_DVDNT	0.244***	0.502***	0.351***	0.179***	-0.084*	0.233***	0.193***	-0.053	0.137***	0.525***	0.010	-0.383***	0.144***	1	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.085)	(0.000)	(0.000)	(0.274)	(0.005)	(0.000)	(0.846)	(0.000)	(0.003)		
(15) CAPEXPTR	0.456***	0.390***	0.534***	0.218***	-0.076	0.230***	-0.151**	-0.113**	0.096**	0.461***	-0.037	0.240***	0.013	0.191***	1
	(0.000)	(0.000)	(0.000)	(0.000)	(0.107)	(0.000)	(0.035)	(0.016)	(0.035)	(0.000)	(0.435)	(0.000)	(0.785)	(0.000)	

***, **, & * suggest significance at levels of 0.01, 0.05, & 0.1 (2-tailed), respectively.

Table 5: Impact of FL_G on VRSKD

	Pred. Sign	Dependent variable: VRSKD	
		Coefficients (t-statistics)	Coefficients (t-statistics)
Constant		4.791*** (5.192)	3.873*** (4.347)
BRD_S	+		-1.138** (-2.388)
BRD_MT	+		-0.461 (-0.937)
BRD_IND	+		1.862*** (3.904)
CEO_D	–		-0.125 (-0.911)
OWNER_MGMT	–		-1.417** (2.126)
AUDT_COMT	+		1.974*** (3.038)
F_SIZE	+	3.873*** (5.052)	4.921*** (6.511)
F_PRFT	+	0.416 (1.144)	0.362 (1.342)
F_LQ	+	1.358* (1.694)	0.939* (1.632)
F_LV	+	0.998 (1.483)	0.126 (1.259)
F_DVDNT	+	1.175** (2.789)	1.509*** (3.134)
YFE		Yes	Yes
IFE		Yes	Yes
F-test		11.759***	10.018***
R^2		49.748%	63.193%
Obs.		1388	1388

***, **, & * suggest significance at levels of 0.01, 0.05, & 0.1, respectively.

Table 6: Impact of FL_G on VRSKD – IMATQ nexus

	Pred. Sign	Dependent variable: IMATQ	
		Model (2)	Model (3)
Constant		3.579***	3.341***
		(4.831)	(4.485)
VRSKD	+	2.194***	1.763***
		(4.677)	(3.598)
BRD_S	+	0.025*	0.019
		(1.685)	(1.250)
BRD_MT	+	0.093	0.076
		(1.260)	(0.969)
BRD_IND	+	1.382***	1.063**
		(2.868)	(2.206)
CEO_D	–	-0.046	-0.035
		(-0.914)	(-0.703)
OWNER_MGMT	–	-1.193**	-0.915*
		(-2.191)	(-1.685)
AUDT_COMT	+	1.065**	0.819**
		(2.172)	(2.440)
VRSKD x BRD_S	+		-0.003
			(-0.870)
VRSKD x BRD_MT	+		0.002
			(0.940)
VRSKD x BRD_IND	+		0.071*
			(1.686)
VRSKD x CEO_D	–		-0.010
			(-0.691)
VRSKD x OWNER_MGMT	–		-0.009**
			(-2.235)
VRSKD x AUDT_COMT	+		0.011***
			(2.823)
F_SIZE	+/–	3.951***	3.039***
		(5.439)	(4.184)
F_PRFT	+	2.631***	2.046***
		(5.152)	(3.963)
F_LQ	+	1.030**	0.792*
		(2.207)	(1.698)
F_LV	–	-0.356*	-0.274
		(-1.806)	(-1.389)
F_DVDNT	+	1.417***	1.113**
		(2.926)	(2.251)
CAPEXPTR	+/–	1.479**	1.138**
		(2.137)	(1.941)
YFE		Yes	Yes
IFE		Yes	Yes
F-test		24.621***	18.941***
R^2		32.419%	37.816%
Obs.		1388	1388

***, **, & * suggest significance at levels of 0.01, 0.05, & 0.1, respectively.

Table 7: Sensitivity analysis results

	Pred. Sign	Dependent variable: M-B	
		Model (2)	Model (3)
Constant		5.128***	3.581***
		(5.874)	(4.807)
VRSKD	+	2.747***	1.921***
		(3.514)	(3.856)
BRD_S	+	0.024	0.017
		(1.136)	(1.340)
BRD_MT	+	0.016	0.081
		(1.186)	(1.039)
BRD_IND	+	1.258***	1.086**
		(2.731)	(2.364)
CEO_D	−	-0.054	-0.038
		(-1.077)	(-0.753)
OWNER_MGMT	−	-1.250**	-0.874*
		(-2.491)	(-1.742)
AUDT_COMT	+	1.371***	0.931***
		(4.047)	(2.830)
VRISK x BRD_S	+		-0.001
			(-0.933)
VRISK x BRD_MT	+		0.004
			(1.007)
VRISK x BRD_IND	+		0.084*
			(1.593)
VRISK x CEO_D	−		-0.013
			(-0.513)
VRISK x OWNER_MGMT	−		-0.006**
			(-2.396)
VRISK x AUDT_COMT	+		0.014 ***
			(3.776)
F_SIZE	+/−	2.658***	3.257***
		(3.305)	(4.409)
F_PRFT	+	2.136***	2.193***
		(3.120)	(4.280)
F_LQ	+	1.214**	0.849*
		(2.603)	(1.820)
F_LV	−	-0.428**	-0.294
		(-2.129)	(-1.489)
F_DVDNT	+	1.706***	1.193**
		(3.405)	(2.381)
CAPEXPTR	+/−	1.563**	1.072*
		(2.164)	(1.652)
YFE		Yes	Yes
IFE		Yes	Yes
F-test		23.407***	17.518***
R^2		33.174%	39.493%
Obs.		1388	1388

***, **, & * suggest significance at levels of 0.01, 0.05, & 0.1, respectively.