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Article

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Cogent Economics & Finance

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Suggested Citation: Khiem Dieu Truong (2022) : Corporate governance and financial distress: An endogenous switching regression model approach in vietnam, Cogent Economics & Finance, ISSN 2332-2039, Taylor & Francis, Abingdon, Vol. 10, Iss. 1, pp. 1-17, <https://doi.org/10.1080/23322039.2022.2111812>

This Version is available at:

<https://hdl.handle.net/10419/303760>

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To cite this article: Khiem Dieu Truong (2022) Corporate governance and financial distress: An endogenous switching regression model approach in vietnam, Cogent Economics & Finance, 10:1, 2111812, DOI: [10.1080/23322039.2022.2111812](https://doi.org/10.1080/23322039.2022.2111812)

To link to this article: <https://doi.org/10.1080/23322039.2022.2111812>



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Received: 01 February 2022
Accepted: 06 August 2022

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FINANCIAL ECONOMICS | LETTER

Corporate governance and financial distress: An endogenous switching regression model approach in vietnam

Khiem Dieu Truong^{1*}

Abstract: This study aims to determine the impact of Corporate Governance on the relationship between the macro and micro factors causing financial distress in 240 Vietnamese listed non-financial firms. The study also investigates the marginal benefits of different corporate governance practices by applying an endogenous switching regression model (ESRM). The research clarifies that a firm with strong corporate governance practice has a low probability of financial distress compared to a weak corporate governance firm. Moreover, the risk of financial distress is significantly reduced when improving the corporate governance practice. This paper contributes empirical evidence on the predominant benefit of strong corporate governance practices and marginal benefit in risk mitigation in enhancing corporate governance. The article suggests that Vietnamese firms should implement strong corporate governance to overcome the risk of financial distress.

Subjects: Quantitative Finance; Corporate Finance; Entrepreneurial Finance

Keywords: Corporate governance; financial distress; emerging countries; endogenous switching regression

JEL: G340; G320

1. Introduction

Strong corporate governance (SCG) practice guarantees transparency and consistency in financial statements. Firms can approach external sources at low costs when they have the confidence of investors (Fama & Jensen, 1983; Lipman, 2007; Tricker & Tricker, 2015). Additionally, the implementation of SCG practice ensures the usage of the optimal business strategy to maximise firm value and mitigate related risks in the future (Fich & Slezak, 2008; Husson-Traore, 2009; Manzanique et al., 2016). The collapse of corporations resulting from the financial crisis of 2008 is evidence of the ramifications of weak corporate governance (WCG) implementation (Isaksson & Kirkpatrick, 2009; Kirkpatrick, 2009; Kumar & Singh, 2013; Mehran et al., 2011; Strouhal et al., 2012). SCG policies shield firms from the risk of financial distress or insolvency, which are among the biggest causes of bankruptcy. The role of SCG adoption in mitigating financial distress has been well recognised in developed countries. Many researchers have conducted empirical research on the impact of good corporate governance (CG) implementation on the probability of financial distress. These studies have homogeneously proven the adverse effects of good CG practice on the likelihood of distress risk (Bravo-Urquiza & Moreno-Ureba, 2021; Miglani et al., 2015; Peni & Vähämaa, 2012; Van Essen et al., 2013). Therefore, firms in developed countries readily adopt SCG policies.

Although developing countries appreciate the importance of CG, the benefits of CG, which have functioned only with good CG adoption, have not been a priority. Therefore, CG implementation in transitional economies is lacking (Nurunnabi, 2020).

Furthermore, emerging countries are inherently affected by firms that practice family ownership, so they suffer from high levels of corruption and absenteeism among eminent directors. Consequently, adopting SCG policies in emerging countries is more of a hurdle than in developed countries because firms are hesitant to adopt SCG (McGee, 2009). The advantages of good CG adoption, such as low capital costs, effective management and risk mitigation, are hardly understood in emerging countries (Nurunnabi, 2020).

Vietnam is an emerging economy that has experienced significant development recently. The Vietnamese Government has also reformed policies to maintain a stable environment and attract foreign investors (Vo, 2017). Furthermore, the Ho Chi Minh stock market (HOSE) has gradually developed to follow international standards. The rise of outbound investors has increased capital mobilisation in Vietnam, which has made the Vietnamese equity market more critical in Asia (Vo, 2017). To grow further, a mechanism to protect investors and shareholders is required. CG is an effective tool to protect investors and shareholders by increasing integrity, transparency, and risk mitigation strategies. Like developing countries, the important role of CG is not well understood in Vietnam (Vo, 2017). The fast growth and WCG practice are the characteristics of the developing countries (Derviş, 2012; McGee, 2009). Vietnam comprises all attributes of the developing countries. Therefore, Vietnam can represent the developing countries in this paper.

Moreover, empirical evidence of the benefits of CG in hindering the likelihood of financial risk is still obscure and disputable in developing countries (Al-Tamimi, 2012; Lee & Yeh, 2004; Li et al., 2021; Wang & Deng, 2006; Younas et al., 2021). There is little empirical evidence of the relationship between CG and financial distress in Vietnam. Therefore, this research firstly clarifies the determinants of SCG performance. Secondly, the paper investigates the impact of CG on the probability of financial distress in Vietnam using data from 2010 to 2019. Lastly, the paper also identifies the marginal benefit in financial distress mitigation when upgrading the CG practice. The research will contribute to the empirical literature on the association between CG practice and financial distress in emerging countries. Besides employing the endogenous switching regression model (ESRM), the research presents more results that have not been found in previous studies (Al-Tamimi, 2012; Lee & Yeh, 2004; Li et al., 2021; Shumway, 2001; Wang & Deng, 2006). First, this research aims to identify the factors of SCG practice. Second, this research also contributes to empirical studies on the predominant benefits of SCG practices in financial distress mitigation. Finally, this study contributes to marginal risk mitigation when improving CG practice. This paper is a novel study that applies the ESRM.

The paper is constructed as follows. Section 2 discusses the literature review. The methodology is presented in section 3. Section 4 provides the result analysis. Finally, the conclusion, implication and limitation are mentioned in section 5.

2. Literature review

Information asymmetry results in a conflict in the interests of the agent and principal, or managers and shareholders. Managers try to maximise their interests. Therefore, they will apply tactics to reduce the wealth of shareholders (Bergstresser & Philippon, 2006). Managers neglect to consider the sustainable development of the firm, which pushes the firm towards a high probability of financial distress. CG is used as a tool to mitigate the violation of shareholders' interest and agency problems (Ashraf et al., 2022). Independent directors and separation between the CEO and chairman and the independent committees are suggested to reduce the power of managers (Ashraf et al., 2022). Otherwise, stewardship theory indicates that managers are stewards who protect shareholders' interests with optimal strategies. The steward will try their best to fulfil the goals of the shareholders (Neifar & Utz, 2019), and the manager maximises the shareholders'

wealth per their interests. CEO duality, dependent directors and dependent committees will strongly empower managers to protect shareholders (Neifar & Utz, 2019). Managerial behaviour is different according to the two theories' viewpoints. Therefore, CG practice under agency theory and stewardship theory quite varies.

Lee and Yeh (2004) confirmed the negative relationship between good CG and the probability of financial distress in Taiwan from 1996 to 1999. Additionally, the research indicated that a greater percentage of shares held by directors, a larger board size and a greater number of outside directors would indicate good performance in CG practices. In contrast, Wang and Deng (2006) stated that highly dependent directors lead to a low probability of financial distress. However, there was no significant link between board size and CEO duality and the possibility of financial distress in the Chinese market. Similarly, the independent directors, the opinions of the third-party audited by the Big Four firms and the presence of the audit committee had an adverse effect on the possibility of financial distress (Ting et al., 2008). Conversely, Shahwan's (2015) research presented an insignificant relationship between CG practices and the possibility of financial distress in Egypt. The CG index was measured using the variables of independent director, CEO duality, director ownership, board size, and auditing committee. Li et al. (2021) stated that independent directors had an advantageous association with the risk of financial distress in China. Additionally, directors' expertise and duality were found to negatively impact the risk of financial distress in China. Ashraf et al. (2022) indicated that an independent board would reduce the risk of financial distress potential in China and the UK. The research also proved a negative relationship between board size and CEO duality and financial distress. The nomination and compensation committees were found to have an unfavoured connection to the probability of financial distress. However, there was no significant link between audit committees and financial distress. Previous research has provided inconsistent results regarding CG components. The studies of Lee and Yeh (2004, 2008) supported the agency theory regarding independent directors and the separation of the CEO and chairman. Li et al. (2021); Wang and Deng (2006) advocated for the stewardship theory, arguing for the need for a dependent director and CEO duality. In contrast, Ashraf et al. (2022) argued for both agency theory and stewardship with independent directors and CEO duality. Therefore, it is necessary to conduct this research to provide more empirical evidence. Previous research employing the logistic model has focused only on the impact of certain dimensions of CG on financial distress. These results cannot define the factors of SCG practices. Furthermore, previous research cannot conclusively confirm whether SCG practices have protective effects against financial distress risk. Lastly, these studies cannot point out the quantifiable benefits of improving CG practices. Therefore, this study will address this gap in previous research by applying the ESRM. Good CG practices are constructed through four components: board function, audit function, remuneration committee and nomination committee (Ashraf et al., 2022; Cadbury, 2000; Clarke, 2004; Rodriguez-Dominguez et al., 2009; Wymeersch, 2006). The merit of financial distress being counteracted by SCG practices is discussed. This work also measures risk mitigation when advancing CG practices. Despite the inconsistent findings in prior research, these studies generally stated the benefits of CG items in reducing the risk of financial distress. Therefore, the following hypothesis is proposed by referring to the discussed theories and previous research:

H1: A WCG firm is riskier in financial distress than a SCG firm.

Besides, the studies of Ashraf et al. (2022), Lee and Yeh (2004), Li et al. (2021), Shahwan (2015), Ting et al. (2008), and Wang and Deng (2006) confirmed that the SCG practice resulted the low probability of the financial distress. Thus, the firm had more chance to overcome the risk of financial distress when improving the CG practice.

H2: There is the negative relation between financial distress and CG improvement.

Moreover, some macro and micro factors are considered in this study. The micro factors are firm size, gross profit margin, return on assets (ROA), financial leverage and current ratio. The macro

elements are gross domestic product (GDP) growth rate, inflation rate, unemployment rate, interest rate and stock index (Li et al., 2021; Miglani et al., 2015; Peni & Vähämaa, 2012; Van Essen et al., 2013; Younas et al., 2021).

3. Research design and methodology

3.1. Data collection

The data was collected from 240 non-financial firms listed on the Ho Chi Minh stock exchange (HOSE) from 2010 to 2019. The financial information and CG were collected from the Vietstock database. A total of 367 non-financial firms were listed in the HOSE from 2010 to 2019. However, 127 non-financial firms did not have adequate information on CG and financial information from 2010 to 2019. Therefore, 127 non-financial firms were excluded from the sample. There were finally 2400 observations in the paper. The paper firstly estimates the threshold gauge of CG score, explained in detail in the econometric model. The SCG is recognized when the CG score of the firm is equal to or higher than the threshold gauge. The WCG is determined when the CG score is less than the threshold gauge.

3.2. Econometric model

The paper applies ESRM for some reasons. The paper first determines the determinants of the SCG. Secondly, this paper aims to clarify the interactions between macro and micro factors and financial distress according to SCG and WCG patterns (Heckman & Vytlačil, 2005). The traditional logistic model cannot compare the specified benefits of different SCG and WCG practices. Additionally, the logistic model cannot elucidate the marginal benefits of upgraded CG practice on financial distress mitigation. Therefore, ESRM is superior to the logistic model in fulfilling the rationale of the research (Heckman & Vytlačil, 2005; Tang & Chang, 2015).

These two patterns are bifurcated using the threshold gauge (S^*). The threshold gauge (S^*) is determined endogenously to classify the sample firms into two groups. The research function with the SCG is estimated as follows:

$$Y_{i,t} = X_{i,t}\beta^{SCG} + \varepsilon_{1,it} \quad (1)$$

$$\text{If } CG_{score} S_{i,t}^* = Z_{i,t}\delta + u_{i,t} \quad (2)$$

The research function of WCG is as follows:

$$Y_{i,t} = X_{i,t}\beta^{WCG} + \varepsilon_{1,it} \quad (3)$$

$$\text{If } CG_{score} < S_{i,t} = Z_{i,t}\delta + u_{i,t} \quad (4)$$

with $X_{it} = [1, ROA_{it}, LEV_{it}, Firmsize_{it}, CR_{it}, GM_{it}, GDPgrowth_{it}, IR_{it}, INFR_{it}, UE_{it}, SI_{it}]$

and $Z_{it} = [1, ID_{it}, SE_{it}, DO_{it}, BS_{it}, AC_{it}, FM_{it}, EX_{it}, RC_{it}, NC_{it}]$.

β^{SCG} , β^{WCG} and δ are the coefficients of the factors in the SCG and WCG patterns and determinants of corporate governance, respectively. Equations (1) and (3) illustrate the results of the association between the micro and macro factors and financial distress probability according to the two patterns of SCG and WCG.

In this model, (1) and (3), Y is the dependent variable indicating the financial distress measured by Altman Z-score. The independent variables are ROA estimated by the ratio of the net income on the book value of total assets, LEV is calculated by a percentage of the book

value of total debt on the book value of the total assets, Firm size is proxied by the logarithmic of market value, CR is measured by the ratio of current assets to current liabilities, GM is the ratio of the gross profit on the total revenue, GDP growth is the GDP growth rate, IR is the interest rate, INFR is the inflation rate, UE is the unemployment rate, SI is the stock index. A detailed explanation of variables is in [Table A1](#) of the Appendix. Furthermore, the studies of Li et al. (2021), Miglani et al. (2015), Peni and Vähämaa (2012), Van Essen et al. (2013), and Younas et al. (2021) proved that ROA, LEV, Firm size, CR, GM, GDP growth, IR, INFR, UE and SI were crucial determinants of financial distress. Therefore, ROA, LEV, Firm size, CR, GM, GDP growth, IR, INFR, UE and SI are considered in this paper.

Functions (2) and (4) are margin equations of CG used to classify SCG or WCG. ID is the independent director measured by the percentage of independent and outside directors. SE is a dummy variable, SE is 1 when there is the separation of CEO and Chairman, otherwise, 0. DO is director ownership measured by the percentage of the shares held by the directors. BS is the board size proxied by the number of board members. AC is an auditing committee measured by the portion of independent audit members. FM is a frequent meeting measured by the number of annual meetings of the board. EX is the expertise of a director proxied by the education background, managerial years and working experience years of the director. RC is a remuneration committee measured by the percentage of independent remuneration members. Finally, NC is the nomination committee proxied by the ratio of independent members.

SCG is identified when the firm's CG score surpasses the threshold value, determined in the linear regression model. Otherwise, WCG is classified when the firms' CG score is less than the threshold value, estimated using the linear regression model.

The ESRM allows for the differentiation of the expected Altman Z-scores of firms with SCG (5) from those of firms with WCG (8). The model also allows for the exploration of the expected Z-scores of firms with WCG upgrading their CG practices (6) and firms with SCG degrading to WCG practices (7), which cannot be assessed using logistic regression models (Heckman & Vytlačil, 2005). Since the parameters of the model are estimated, the conditional outcomes are calculated as follows ([Table A2](#) in Appendix):

The Z-score of the SCG is adopted:

$$E(Y_{SCGi}|S_i = 1) = X\beta_{SCGi} + \sigma_{SCGe}\lambda_{SCG} \quad (5)$$

The Z-score of the firms with WCG that upgraded to SCG (counterfactual):

$$E(Y_{WCGi}|S_i = 1) = X\beta_{SCGi} + \sigma_{WCGe}\lambda_{SCG} \quad (6)$$

The Z-score of firms with SCG that downgraded to WCG (counterfactual):

$$E(Y_{SCGi}|S_i = 0) = X\beta_{WCGi} + \sigma_{SCGe}\lambda_{WCG} \quad (7)$$

The Z-scores of firms with WCG:

$$E(Y_{WCGi}|S_i = 0) = X\beta_{WCGi} + \sigma_{WCGe}\lambda_{WCG} \quad (8)$$

4. Results analysis and discussion

4.1. Descriptive statistics

Table A3 in the Appendix below reports the characteristics of the dataset used in this study, including the mean and standard deviations (SDs) of independent and dependent variables across the entire sample, firms with SCG and firms with WCG. The firms with SCG and WCG are dichotomised according to the threshold CG index estimated in Equations (1) and (3).

In the sample, the mean value of the Altman Z-score is 3.66. Additionally, the average Z-score of the firms with SCG is 7.28. On average, firms with SCG are in the safe zone with a low probability of financial distress. Otherwise, the average Z-score of firms with WCG is 3.182, which indicates that firms with WCG suffer a high probability of financial distress due to a low Altman Z-score. The average CR of the sample is about 0.076%. The gap in the CR between firms with SCG and WCG shows considerable divergence. The GM average is 18.24%, and the fluctuation is about 16.5%. Additionally, the GM of the SCG is higher by nearly 2% than the value of the GM of the WCG. The firm size shows a mean value of 28.77, and SD was 1.33. There is no significant variance in the sizes of firms with SCG and WCG at 29.07 and 28.59, respectively. ROA shows a mean value of 9.12% with an SD of 9.30%. The ROA of the SCG group is 1.1% higher than the ROA of the WCG group. The average leverage is about 121.43%. The leverage of WCG is 10% higher than the leverage of SCG. There has been no significant fluctuation in the GDP growth rate, inflation rate, interest rate or unemployment rate from 2010 to 2019, and there is a low SD. Thus, the Vietnamese economy stably develops from 2010 to 2019. However, high volatility is witnessed in the Vietnamese stock index (VNI), with an SD of 204.058. Besides, there is a significant difference in the micro factors between SCG and WCG firms at the 1% level. It figures out that SCG firms perform much better than WCG firms.

Table A4 in the Appendix presents the differences in CG components between strong and weak practice. The mean independent director (ID) difference between SCG and WCG is 0.29 and is significant at the 1% level. This indicates that the independent board members of most firms with SCG are 29% higher than the independent members of firms with WCG. The mean CEO and chairman separation (SE) of firms with SCG is 0.641 more elevated than the mean SE of firms with WCG and is significant at the 1% level. The results show that most firms with SCG separate the CEO and chairman roles. Around 32% of firms with WCG separate the CEO from the chairman. The mean difference in director ownership (DO) between firms with SCG and firms with WCG was 0.441, which is significant at the 1% level. The results indicate that 64.5% of firms with SCG implement director ownership, while only 23.4% of firms with WCG. The mean difference in the auditing committee (AC) between firms with SCG versus WCG is 0.427 and is significant at the 1% level. Approximately 85% of auditing committee members are independent in firms with SCG, which is 32.4% higher than in firms with WCG. The variance in the mean of expertise (EX) firms with SCG versus WCG is 8.2 and is significant at the 1% level. The results show that directors' years of experience in firms with SCG are, on average, 8.2 years higher than directors in firms with WCG. The divergence in the mean of the remuneration committee (RC) and nomination committee (NC) among SCG and firms with WCG are 0.296 and 0.4496, respectively, and are significant at the 1% level. This indicates that there are typically 73.5% independent remuneration committee members and 80.1% independent nomination committee members in firms with SCG. Independent remuneration committee members and nomination committee members occupy 43.9% and 35.14% of the committee, respectively, of firms with WCG. There is no significant difference in the mean board size (BS) and frequent meetings (FMs) between firms with SCG versus WCG.

4.2. Empirical findings and discussion

Table A5 in the Appendix shows the significant difference between the σ_1 with 17.983 and σ_2 with 0.54, proving endogeneity. Additionally, the highly significant value of the Wald test results indicated the goodness of fit of the ESRM.

The model presents the contributions of CG to the relationship between macro and micro factors and financial distress. The CG endogenous switching equation is measured by the ID, SE, DO, BS, AC, FM, EX, RC and NC. Regarding the results of the switching function, there is a positive relationship among the ID, SE, DO, AC, BF, EX, RC, NC and CG. This indicates that an increase in the independence of directors, a separation between the CEO and chairman, director ownership, independence of the auditing committee, expertise and independence of the remuneration and nomination committees result in good CG practices. Therefore, the results of this study prefer the agency theory, which suggests that an independent director, separation between the CEO and chairman and independent committees prevent agency problems (Bravo-Urquiza & Moreno-Ureba, 2021; Miglani et al., 2015; Van Essen et al., 2013). Independent directors mitigate the impact of the CEO by efficiently monitoring the CEO. The conflict between managers and majority shareholders and that between majority and minority shareholders is then also mitigated (Bravo-Urquiza & Moreno-Ureba, 2021; Miglani et al., 2015; Van Essen et al., 2013). The separation between the CEO and the chairman divides the controlling and monitoring tasks. As such, monitoring would be conducted without bias. Director ownership fosters the commitment of directors to the firm. The director supervises the managers effectively to protect themselves. Additionally, directors with extensive experience and a strong academic background conduct their tasks more effectively. Independent auditing committees eliminate earnings management activities to serve managers' individual purposes (Ashraf et al., 2022). This enhances the transparency and reliability of financial reports, and shareholders are strongly protected. Outside remuneration committees establish optimal compensation policies to motivate executives to attain the long-term benefits of shareholders (Ashraf et al., 2022). Independent nomination committees propose the best members of the board and executives. Additionally, the performance of board members and executives is evaluated relatively and efficiently (Ashraf et al., 2022). Otherwise, BS or FQ have no impact on CG performance.

There is a positive relationship between ROA and the Altman Z-score, which is the opposite of the probability of financial distress in firms with SCG or WCG. However, the firm with WCG moderates the Altman Z-score more than the firm with SCG when the firms create a positive ROA of 10.36 versus 13.133, respectively. A positive ROA indicates good performance in a certain period. However, SCG practices monitor and consult the activities of the CEO to sustain short- and long-term growth. Strong practices better protect the firm from the risk of financial distress than weak practices in both the short and long term (Bravo-Urquiza & Moreno-Ureba, 2021).

Both firms will reduce the Altman Z-score when taking on high debt. However, the Altman Z-score of a firm with WCG crashes more conspicuously than its peers, with values of -0.449 versus -0.163 . The considerable plunge in the Altman Z-score implies a high probability of falling into financial distress. High debt results in a debt burden, which increases the risk of default and financial distress. Thus, SCG would ensure that executives employ the optimal capital structure to bring the most benefit to the firm. Under the strong practice, managers also optimally utilise capital sources (Bravo-Urquiza & Moreno-Ureba, 2021).

Regardless of WCG and SCG practices, firm size negatively links the Altman Z-score at -0.16 versus -0.14 . The current ratio and gross profit margin have a significantly positive relationship with the Z-scores of firms with SCG and WCG. However, the advantageous relationship is more significant in firms with SCG. In practising SCG, the manager aims to maintain high liquidity and profitability to increase the survival probability. Therefore, the high liquidity and profitability of SCG are always at the optimal level to gain the high Altman Z-score. A high Altman Z-score will reduce the likelihood of financial distress (Li et al., 2021).

The correlation between the GDP growth rate and the Z-scores of both types of governance is confirmed. However, the magnitude of the impact of the GDP growth rate on the Altman Z-score of a firm with SCG is greater than the Z-score of a firm with WCG at 2.6 versus 1.14, respectively. A higher escalation in the Z-score implies a lower probability of financial distress. Consequently,

a firm with WCG more quickly deteriorates in financial distress than a firm with SCG. Managers work more effectively when SCG practices are implemented rather than WCG practices, as there are good strategies for intensifying short- and long-term positions. Therefore, a lower chance of financial distress occurs for firms with SCG (Neifar & Utz, 2019).

The results of the study are consistent with the results of studies done by Bravo-Urquiza and Moreno-Ureba (2021), Miglani et al. (2015), Peni and Vähämaa (2012), and Van Essen et al. (2013), which were conducted in developed countries. The research also supports the results of studies by Lee and Yeh (2004), Ting et al. (2008), and Wang and Deng (2006). However, the study is inconsistent with the research of Li et al. (2021); Shahwan (2015). The result of the paper indicates that SCG is a prominent tool for monitoring and evaluating administrative tasks, as administrative activities must be aligned to fulfil a firm's long-term goals. The interest of investors is protected sustainably. Therefore, financial distress is decreased in firms that practice SCG compared to firms that practice WCG (Bravo-Urquiza & Moreno-Ureba, 2021).

Table A6 in the Appendix explicates the impact of CG on financial distress, especially the Altman Z-score. The ESRM results show significant divergence in the Altman Z-score of CG conduct. Table A6 shows that the Altman Z-score of a firm with SCG is 4.128, 122% higher than the Altman Z-score of a firm with WCG. The firm with WCG enhanced to having SCG will increase to an Altman Z-score of 4.399, 143% greater than when CG practice is not enhanced. As such, SCG yields a higher Altman Z-score. Firms that improve their CG practices also earn materially high Altman Z-scores, which increase to 143%, thus substantially mitigating the financial distress problem. The results prove the effectiveness of CG in overcoming the risk of financial distress. The interests of shareholders are strongly preserved by SCG, which boosts a firm's credibility. A firm will have greater chances of accessing more affordable capital sources when enhancing from WCG to SCG. The affordable cost of capital will benefit from the low probability of insolvency (Nurunnabi, 2020).

5. Conclusion

This study explores the impact of CG on financial distress. The data includes 240 Vietnamese non-financial listed firms that published reports from 2009 to 2019. The rationale for applying the ESRM is to determine the impact level of the different CG practices on the probability of financial distress under various macro and micro contexts. Additionally, the study aims to clarify the quantifiable margin benefit in improving the Altman Z-score and reducing the probability of financial distress when there is an improvement from WCG to SCG practices. These results are not derived using the conventional logistic model.

The results indicate that CG is a strong practice when there are independent directors, a separation of the CEO and chairman, director ownership, independence of the auditing committee, an eminent board of directors and independence of the remuneration and nomination committees. A firm engaging in SCG practices will intensify the Altman Z-score more strongly than a firm with WCG practices under favourable macro and micro conditions. Otherwise, SCG practices will better protect a firm from financial distress under unfavourable macro and micro conditions than WCG practices. The results also state that the Altman Z-score of firms with SCG is always materially higher than the Altman Z-score of WCG firms in different macro and micro-environments. Moreover, there is a significant improvement in the Altman Z-score when the firm boosts WCG practices to SCG practices.

The results suggest that an external and independent director, separation of the CEO and chairman, director ownership, independence of the auditing committee, an eminent board of directors and independence of the remuneration and nomination committees are essential factors to ensure shareholders' benefits. The research further suggests that a firm should employ external directors with a strong academic background and experience and should employ outside committees to mitigate the conflict between the agent and principle or between managers and shareholders, thus limiting the likelihood of financial distress. The paper contributes to the literature on

factors of SCG practices. The independent board and committees will make CG practices better. The SCG roots the firms to overcome the risk of financial distress.

There are implications for the government and stakeholders in emerging countries that dependent directors and the dependence of committees cannot protect the benefits of majority and minority shareholders from managers' misconduct. The independent directors and committees will protect the investors vigorously. SCG is vital to the survival of firms. The survival probability rises when there is an improvement in CG practices. Therefore, policymakers should issue CG policies in which the independence of directors and committees is strongly considered to protect the interests of shareholders. Independent directors will effectively monitor executive tasks. Audit, nomination and remuneration committees that can act independently enhance the accountability and transparency of a firm. Additionally, Government should issue policies to encourage the firm to upgrade their CG practices. The investors may consider investing in the firm with independent directors and committees to be protected better.

In addition to its contributions to the literature, the research also has limitations. The study does not consider the impact of the risks of the pandemic on the probability of a firm's financial distress. Thus, future research should consider the effect of COVID-19 on the likelihood of financial distress to prove the eminent function of SCG practices in protecting firms in the crisis period. Besides, the paper is conducted in developing countries. Therefore, the result of the paper may be relevant and applicable to developing countries.

Funding

The author received no direct funding for this research.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

Citation information

Cite this article as: Corporate governance and financial distress: An endogenous switching regression model approach in vietnam, Khiem Dieu Truong, *Cogent Economics & Finance* (2022), 10: 2111812.

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Appendix

Table A1. Variables description

Variables	Variable names	Measurement
Dependent Variable		
Y	Financial distress (FD)	Altman Z-score is the proxy of the financial distress $\text{Altman Z-score} = 1.2 * (\text{Working capital} / \text{Total assets}) + 1.4 * (\text{Retained earnings} / \text{Total assets}) + 3.3 * (\text{Earnings before interest and tax} / \text{Total assets}) + 0.6 * (\text{Market value of equity} / \text{Total liabilities}) + 1 * (\text{Total sales} / \text{Total assets}).$ 0–1.8 is the distress zone 1.8–3 is the grey zone 3–4 is the safe zone
Independent Variable		
ROA	ROA	The ratio of the net income on the book value of total assets.
LEV	LEV	The ratio of the book value of the total debt to the book value of the total assets.
Firm size	Firm size	Logarithmic of market value.
CR	Current ratio	The ratio of current assets to current liabilities
GM	Gross profit margin	The ratio of the gross profit to the total revenue
GDP Growth rate	GDP Growth rate	GDP Growth rate (collected from the Vietnamese Statistic Department)
INFR	Inflation rate	Inflation rate (collected from Vietnamese Statistic Department)
IR	Interest rate	Borrowing interest rate (collected from Vietnamese Statistic Department)
UE	Unemployment rate	Unemployment rate (collected from Vietnamese Statistic Department)
SI	Stock Index	VNI Stock Index (collected in HOSE)
Corporate Governance		
ID	Independent Director	% of independent and outside directors.
SE	Separation of CEO and Chairman	1 if there is the separation of CEO and Chairman, otherwise, 0.
DO	Director Ownership	The percentage of the shares held by the directors.
BS	Board size	The number of the board members.
AC	Auditing Committee	% of independent members.

(Continued)

Table A1. (Continued)

Variables	Variable names	Measurement
FM	Frequent Meeting	The number of annual meetings of the board of directors.
EX	Expertise	The educational background, managerial years and the working experience years of the directors.
RC	Remuneration Committee	% of independent members.
NC	Nomination Committee	% of independent members.

The table describes the variables in the model with the dependent variable, independent variables and corporate governance variables of the 240 listed Vietnamese firms in HOSE from 2010 to 2019 following the research of (Cadbury, 2000; Clarke, 2004; Wymeersch, 2006; Rodriguez-Dominguez et al., 2009; Peni & Vähämaa, 2012; Van Essen et al., 2013; Miglani et al., 2015; Van Essen et al., 2013; Li et al. 2021; Younas et al., 2021)

Table A2. Conditional expectations, treatment and heterogeneous effect

Altman Z-score	Adoption status	Prediction		Treatment effect
		SCG	WCG	
Altman Z-score	Firm with SCG	(5) $E(y_{1i} S_i = 1)$	(6) $E(y_{0i} S_i = 1)$	TT
	Firm with WCG	(7) $E(y_{1i} S_i = 0)$	(8) $E(y_{0i} S_i = 0)$	TU
	Heterogeneity effect	BH ₁	BH ₀	TH

(a) TT = (5)-(6)

(b) TU = (7)-(8)

(c) BH_i: the effect of the base heterogeneity for firms with strong corporate governance and weak corporate governance.

(d) TH = TT-TU is the transitional heterogeneity.

Table A3. Descriptive statistic of the variables: mean, standard deviation, SCG and WCG

	Sample		Strong Corporate Governance (SCG)		Weak Corporate Governance (WCG)		Difference
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	
ROA	0.09125	0.0928	0.0988	0.1109	0.087	0.07963	0.0118***
LEV	1.2143	0.9708	1.1509	1.1072	1.252	0.87737	-0.1011***
Firmsize	28.7704	1.3287	29.0685	1.5374	28.59	1.1507	0.4785***
CR	0.076	1.4593	0.1265	1.5469	0.041	1.4019	0.0855***
GM	0.1824	0.1645	0.1985	0.1777	0.173	0.1554	0.0255***
Altman Z-score	3.664	1.8034	7.2872	1.0348	3.182	2.737	4.1052***
GDP growth	0.0631	0.005943	0.0631	0.005943	0.063	0.005943	0.0000
Inflation rate	0.06091	0.04971	0.06091	0.04971	0.06091	0.04971	0.0000
Interest rate	0.0988	0.03324	0.0988	0.03324	0.0988	0.03324	0.0000
Unemployment rate	0.01448	0.00384	0.01448	0.00384	0.01448	0.00384	0.0000
Stock Index	636.131	204.058	636.131	204.058	636.131	204.058	0.0000

***p-value < 0.01, ** p-value < 0.05, * p-value < 0.1

The table describes the statistic of the variables in the model. ROA is a return on assets. LEV is leverage. Firmsize is the firm size. CR is the current ratio. GM is the gross profit margin. GDP growth rate is the growth rate of GDP. INFR is the inflation rate. IR is the interest rate. UE is the unemployment rate. SI is the stock index.

Table A4. Test for the mean difference of corporate governance dimensions in strong and weak practice

	Strong Corporate Governance (SCG)		Weak Corporate Governance (WCG)		Difference
	Mean	Standard Deviation	Mean	Standard Deviation	Difference in Mean
ID	0.8546	0.0323	0.564	0.7963	0.2906***
SE	0.965	0.0212	0.324	0.87737	0.641***
DO	0.645	0.5374	0.234	1.1507	0.411***
BS	7.516	1.576	7.652	1.762	-0.136
AC	0.852	0.1242	0.425	0.324	0.427***
FM	2.653	1.534	2.534	1.652	0.119
EX	15.035	1.635	6.8262	1.735	8.2088***
RC	0.735	0.635	0.439	0.5343	0.296***
NC	0.801	0.0132	0.3514	0.0352	0.4496***

***p value < 0.01, ** p value < 0.05, * p value < 0.1

The table tests for the mean difference of corporate governance dimensions in strong and weak practice. ID is an independent director. SE is the separation of CEO and Chairman. DO is the director's ownership. BS is board size. AC is the independence of the auditing committee. FM is frequent meetings. EX is the expertise of the director. RC is the independence of the remuneration committee. NC is the independence of the nomination of the committee.

Table A5. The results of the macro and micro factors affect two patterns applying the endogenous switching regression model (ESRM)

Balance panel (N = 2400)			
Log likelihood = -3763.8357			
Variable			
Weak Corporate Governance (WCG)		Threshold function	
Constant	4.9951***	ID	1.1327***
ROA	10.36031***	SE	0.8842***
LEV	-0.4492***	DO	0.08197***
Firm size	-0.16807***	BS	0.1491
CR	0.580156***	AC	1.0826***
GM	0.53096***	FM	-0.07934
GDP growth rate	1.14063***	EX	0.08688***
Inflation rate	-0.24974	RC	0.3045***
Interest rate	0.105442	NC	2.062***
Unemployment rate	1.487698		
Stock Index	-0.04004	Constant	-4.0508***
		WaldX ²	1423***
σ_1	17.983***		
Strong Corporate Governance (SCG)			
Constant	5.60468***		
ROA	13.1339***		
LEV	-0.1632***		
Firm size	-0.14975***		
CR	1.8178***		
GM	0.87012***		
GDP growth rate	2.68476***		
Inflation rate	-0.25674		
Interest rate	0.17276		
Unemployment rate	1.49654		
Stock Index	-0.04013		
σ_2	0.5436***		

***p value < 0.01, ** p value < 0.05, * p value < 0.1

The table describes the result of the ESRM model. ROA is a return on assets. LEV is leverage. Firm size is the firm size. CR is the current ratio. GM is the gross profit margin. GDP growth rate is the growth rate of GDP. INFR is the inflation rate. IR is the interest rate. UE is the unemployment rate. SI is the stock index. ID is an independent director. SE is the separation of CEO and Chairman. DO is the director's ownership. BS is board size. AC is the independence of the auditing committee. FM is frequent meetings. EX is the expertise of the director. RC is the independence of the remuneration committee. NC is the independence of the nomination of the committee.

Table A6. Impact of CG on the financial distress with ESRM

Altman Z-score	Adoption status	Prediction		Treatment effect
		SCG	WCG	
Altman Z-score	Firm with SCG	7.763	3.635	4.128***
	Firm with WCG	7.463	3.064	4.399***
	Heterogeneity effect	0.300	0.571	−0.271***

***p value < 0.01, ** p value < 0.05, * p value < 0.1



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