Impacts of dynamic capital structure and ownership structure on distance to default: Evidence from Vietnam

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Abstract

This article analyzes the influence of dynamic capital structure and ownership structure on the distance to the default of non-financial firms in Vietnam. My study extends the literature on distance to default and its application in a firm's risk management in Vietnam. I employ the OLS and GMM methods to analyze a sample of 552 listed firms in Vietnam. I also employ Z-scores to check the robustness of distance to default. Firstly, my findings indicate that leverage has a detrimental influence on distance to default before and during the COVID-19 pandemic. Secondly, state ownership and foreign ownership have a positive impact on distance to default before the pandemic. Finally, my findings report that government ownership helps reduce the distress risk of non-financial firms during the pandemic period. My study supports managers in determining effective risk management policies, especially during the pandemic period

Keywords: Distance to default, dynamic capital structure, ownership structure, COVID-19

Introduction

The term "financial distress" is typically used in a negative context to describe a firms' financial performance when it is facing a temporary lack of liquidity (Outecheva, 2007). Altman and Hotchkiss (2010) that corporate financial distress is a vague term used in firms' research: failure, insolvency, bankruptcy, and default. There are two most common ways to measure a company's financial distress risk are through: (1) market-based risk; and (2) accounting database risk (Li & Faff, 2019). Accounting-based models typically use a set of accounting ratio variables (Tian & Yu, 2017). Altman's Z-score is the most well-known of these models. Following Altman (1968) research, Mensah (1984) indicates that past performance involved in a firm's financial statements may not be useful in projecting future performance and hence recommends revising accounting ratio-based models. Hillegeist, Keating, Cram, and Lundstedt (2004) suggest that its capacity to anticipate bankruptcy is likely to be restricted, given that it is formulated to describe the firms' financial condition under the going-concern principle (i.e., assuming it will not go bankrupt). Black and Scholes (1973) and Merton (1974) proposed market-based models in response to criticisms of accounting-based models. Hillegeist et al. (2004), Reisz and Perlich (2007), Campbell, Hilscher, and Szilagyi (2008) have examined market-based models for regard to assessing the probability of default.

Some other formulas for calculating distress risk, such as ZEM-Score to measure financial distress (Altman, 2005; Fan, Huang, & Zhu, 2013; Jacoby, Li, & Liu, 2019). Companies with higher ZEM_Score will have a better financial position. Besides, there are other formulas: Zmijewski-score (Zmijewski, 1984), a higher Zmijewski-score value indicates a higher financial distress risk. O-Score of Ohlson (1980), Griffin and Lemmon

(2002), a higher O-score value is associated with a higher financial distress risk. The higher the value of the Z-score, the less financially distressed the firms. Finally, the higher the liquidity risk, the more probable the firms will bankrupt.

Based on model of Merton (1974), Kealhofer (2003) developed a formula for calculating the distance to default. The foundational assumption behind the distance to the default measurement model is that a company becomes insolvent when the market value of its total assets falls below the default point (Merton, 1974). The model calculates the probability of default through a composite parameter called distance to default, the distance between the expected market value of the firms' total assets and the point of default.

In the early days of the economy, several studies have been to predict the financial difficulty of the business. Beaver (1966) developed the use of accounting ratios. In this study, a dichotomous classification test was used to find financial ratios for predicting bankruptcy. Altman (1968) developed the multivariate statistical model that distinguishes failed firms from non-failing firms. In recent years, Binh, Do, and Vo (2018) and Vu, Do, Dang, and Nguyen (2019) have attention to distress risk in the Vietnamese market. In studies, the forecasts bankruptcy and financial distress in Vietnamese listed companies.

One of the most important financial decisions a firm can generate is determining a proper capital structure. The capital structure emphasizes a combination of debt and equity (Ghasemzadeh, Heydari, & Mansourfar, 2021), such changes in capital structure increase financial distress costs by raising the probability of bankruptcy (Merton, 1974). According to Acosta-Smith, Grill, and Lang (2020), a leverage ratio requirement affects the risk of a highly leveraged bank bankrupting significantly. As a result of the high leverage ratio requirement, financial stability may weaken. One of the root causes of the financial crisis has been identified as the build-up of excessive leverage and subsequent deleveraging in the banking sector. In addition, Ebrahim, Girma, Shah, and Williams (2014) find that an optimal capital structure occurs at a level of leverage where marginal costs (higher likelihood of financial distress) and marginal benefits (tax shield advantages) of increasing debt equate.

Li, Crook, Andreeva, and Tang (2020) analyze the between government ownership and the risk of financial distress in the world's largest emerging market. Campbell et al. (2008) found that distress risk and institutional ownership are adverse. Still Fich and Slezak (2008) and Donker, Santen, and Zahir (2009) do not find an effect of institutional ownership on bankruptcy. Khaw, Liao, Tripe, and Wongchoti (2016) find that state-controlled firms accept less risk, leading to a lower probability of default. Zeitun and Gang Tian (2007) indicate that reducing government ownership may cause the bankruptcy of some firms in the short run. They argue that state-owned enterprises rarely face financial difficulties. Also, state ownership and institutional ownership decrease the risk of firms becoming financially distressed.

From the beginning of 2020 to now, the COVID-19 pandemic has been one of the causes causing many bad effects on the world economy. Many firms in Vietnam faced difficulties and went bankrupt during this period. It has reached a record high in recent years. The General Statistics Office of Vietnam (GSO) report shows that a total of 101.7 thousand firms have stopped doing firms in 2020, an increase of 13,9% over the previous year. Therefore, the average, nearly 8.5 thousand firms leave the market each month on average. In the last ten years, this has never happened before. Social investment capital increased by 5.7 percent in 2020 compared to 2019, the lowest level in the 2011-2020 period. However, in order to expedite the disbursement of public investment capital, the State budget in 2020 has increased capital achieved the highest level in the period 2011-2020 to sustain economic growth in the context of the COVID-19 epidemic's excellent control in Vietnam. Besides, the state capital reached VND 729 trillion, which increased by 14.5% over the previous year; the foreign direct investment sector reached VND 463.3 trillion and decreased by 1.3%. The Government's direct debt repayment obligation is about VND 368,276 billion, of which domestic debt repayment is approximately VND 323,093 billion and foreign debt repayment is approximately VND 45,183 billion; equal to about 27.4 compare the percent of state budget revenue. From the statistics, I can see that the context of Vietnam's economy is volatile, fierce competition between firms, and market demands are becoming increasingly stringent. Therefore, I believe that it is important and urgent to study the distance to default and propose measures to improve the financial capacity of firms in Viet Nam.

My study has three striking results. Firstly, the dynamic capital structure variable is negatively associated with the dependent variable distance to default. This finding is similar to the result of Löffler and Maurer (2011) and Bongini, Ferri, and Hahm (2000). According to Bongini et al. (2000), distance to default decreases when financial leverage is increasing. When the leverage increases, it indicates that the debt is too large. The firm is unable to pay it. The firm will go bankrupt as a result of this. Secondly, the variable of ownership structure is similarly linked to distance to default. State ownership shows a positive effect on the variable distance to default. This demonstrates that firms with state ownership will have more financial leverage. According to the fact that in Vietnam, state-owned firms are impossible to fail. Foreign ownership has the same result as state ownership. This experimental outcome is similar to the findings of Baek, Kang, and Suh Park (2004), Stulz (2009), and Kabir, Miah, Ali, and Sharma (2020). Foreign ownership has little effect on the risk of default in firms with strong liquidity. Kabir et al. (2020) indicate that foreign firms are making short-term investments. When foreign firms remove capital from a firm with high liquidity, the firm may control alternative sources of capital without fear of insolvency. Finally, the outcome of distance to default during the COVID-19 pandemic is the same as that of the distance to default pre-COVID-19 pandemic. This indicates that factors including dynamic capital structure (leverage) and ownership structure (state and foreign) are significantly connected to the variable distance to default. It may be used to evaluate distance to default in a variety of situations.

According to the original research, they use the General Least Squared (GLS) method, which shows evidence of a positive relationship between profitability and distance to default. This result implies that while profitability does not directly reflect the cash flow generated, a highly profitable company will be essential to help facilitate and generate cash flow. Also, debt was guaranteed when it was due. Different from the original paper, I estimate the effect of capital structure and ownership structure on the Distance to a default of Vietnamese listed firms. In addition, I follow Fenech, Yap, and Shafik (2014), and Senior and Bailey (2017) use the GMM method to interpret the results and check the robustness of Distance to default. Arellano and Bover (1995) and Blundell and Bond (1998) also suggest using the GMM method to estimates with higher levels of efficiency and consistency.

The structure of the remainder of the paper is as follows. Section 1 is an introduction. Section 2 is a literature review and hypothesis development. Section 3 describes the data and methodology. Section 4 is the findings, discussions, and robustness check. Section 5 is the conclusion.

Literature review

2.1 Proxies of Distress risk

Financial distress is a term used to indicate a condition when debt payment commitments to creditors of firms are broken or difficult. Financial distress is a significant issue that can lead to a firms' bankruptcy. Financial distress is usually related to a considerable financial burden for the firm, referred to as financial distress expenses (Bae, 2012).

"Distance-to-default" is a credit score derived from observed stock prices and book leverage using a structural model of default risk. Model KMV was established by Keaholfer, McQuown, and Vasicek in 1974. According to the KMV model, the failure of a firm occurs at a time when the market value of the firm's assets derived from the market price of the equity falls below the payable debt (Kliestik, Misankova, & Kocisova, 2015).

Altman (1968) made significant advances by inventing the Z-Score model. Additional contributions to financial crisis research were made during the next two decades. Despite the fact that the Z-Score model was established over four decades ago, the Z-Score model is still utilized globally as a primary or supporting tool for bankruptcy or financial crisis prediction and analysis in both research and practice.

According to the research of Miller (2009), default distance outdoes the Z-Score and the TLTA model in both ordinal and cardinal bankruptcy prediction and had more volatile ratings. Because nearly all situations will require ordinal or cardinal accuracy before worrying about stability, they suggested using the Distance to default

model over the Z-Score model when predicting the bankruptcy situation's firm. Therefore, distress risk using the Distance to default formula to measure the probability of bankruptcy is the most optimal.

2.2 Independent variable

2.2.1 Capital structure and Distance to default

Collin-Dufresne and Goldstein (2001), Dangl and Zechner (2004) extended the classical structural analysis of Merton (1974) by introducing capital structure volatility predicting default risk. The leverage ratio in this study is Liability to Equity (LIA/E), namely the debt-to-equity ratio. Distance to default is a predictor of future financial distress and is negatively related (Löffler & Maurer, 2011). According to Verwijmeren and Derwall (2010), reducing a firm's leverage will reduce the likelihood of financial difficulties. Besides that, Bongini et al. (2000) analyse the effect of debt-to-equity ratio on firms' bankruptcy probability. They show that firms in solid financial positions (lowly leveraged) are less prone to bankruptcy. This result reflects that when the leverage ratio is high, the default distance is reduced. Similarly, Liang, Lu, Tsai, and Shih (2016) show that the relationship is significantly negative between the debt-to-equity ratio and the default distance. The expectation for the variable LIA_E, according to my hypothesis, is:

H1: Leverage variable (LIA/E) negatively correlates with Distance to default.

2.2.2 Ownership structure and Distance to default

The primary independent variable in my analysis is ownership structure. I use two types of ownership proxies: state ownership (STATE) and foreign ownership (FOREIGN).

Alfaraih, Alanezi, and Almujamed (2012) find a positive effect of government shares on financial performance of the firm. Even after adjusting for other factors, Gunasekarage, Hess, and Hu (2007) demonstrate that state ownership has a consistently negative influence on a firm's performance. The expectation for the variable STATE, according to my hypothesis, is:

H2: State ownership is positively correlated to distance to default.

Foreign ownership has a distinct impact on state ownership. Kabir et al. (2020) show that the existence of foreign ownership does not raise default risk for high-liquid Japanese firms, but low-liquid firms are more likely to fail. The expectation for the variable FOREIGN, according to my hypothesis, is:

H3: Foreign ownership is positively correlated to distance to default.

2.2.3 COVID-19 and Distance to default

The complex developments of the COVID-19 epidemic in Vietnam and throughout the world have had a significant impact on the Vietnamese economy, as well as production and commercial operations. A significant wave of corporate bankruptcy, the number of Vietnamese firms dissolving and suspending operations has reached an all-time high in recent years. According to the GSO, a total of 101.7 thousand firms have stopped doing firms in 2020, an increase of 13,9% over the previous year. So, the average, nearly 8.5 thousand firms leave the market each month on average. This information demonstrates that the COVID-19 pandemic has a positive correlation with financial distress. So, the COVID-19 pandemic negatively correlates to Distance to default because the default distance is higher, the better the firms' performance, and the lower the risk of bankruptcy.

2.2.4 Control variable and Distance to default

RE/TA: Tian and Yu (2017) define retained earnings as total assets as a financial ratio that reflects its profitability with its earning capacity. This suggests that irrespective of the regional effects, the higher the profit,

the less likely the company will default. Tian and Yu (2017) indicate that firms with high profitability have a low risk of bankruptcy. Consistent evidence shows that the probability of default is greater for firms.

BVE/TL: the book value of equity on total liabilities indicates a firm's ability to cover its financial liabilities with assets. Altman (2005) used this variable to measure the probability of default in emerging markets, and the higher the BVE/TL, the lower the probability of default.

MV/TE (Tobin's Q): Harney and Tower (2003) find the usefulness of Tobin's Q ratio in explaining the actual return on equity. A company with a high Tobin's Q coefficient shows better performance and more excellent stability and will reduce the risk of bankruptcy (Chiang, Chung, & Huang, 2015). Following that, Kabir et al. (2020) show that having a high firm value (TOBIN's Q) is connected with a lower risk of default.

Data and Methodology

3.1 Data

The original research sample included 771 firms listed on the Ho Chi Minh City Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX). Some of the data used in this study are secondary, while others are hand collected from financial statements such as balance sheets, income statements, and stock prices obtained from *https://vietstock.vn/* and *https://cafef.vn/* from 2010 to 2020. Then I eliminated firms in the banking and finance sectors and investment funds. Finally, I will eliminate listed companies on the stock exchange in 2021, such as DFF, DVG, L40, S74, TV6, VTS, AAT, CLG, MIG, SVD, TNH, VIX. Because several firms were lacking data for a few years, I also removed years without data. Therefore, the final sample data contains 552 general non-financial firms with 5,539 firm-year observations.

3.2 Methodology

This article mentions the compute of Distance to default which is part of the KMV model. The outstanding feature of the KMV model allows estimating the probability of default at any time. In general, the model mainly consists of three steps to determine the probability of default of a company. First, the model discovers the value of the market value of firms' total assets and their volatility of stock prices. Second, Distance to Default is a measure based on the market value and volatility of the asset. Finally, it builds the relationship between default distance and expected default frequency (Vu et al., 2019).

The default distance is determined based on the KMV model as follows:

$$\text{Distance to default} = \frac{ln\frac{V_0}{d^*} + \left(\mu - \frac{\sigma_V^2}{2}\right)T}{\sigma_V\sqrt{T}}$$

where:

V_0 is the current market value of firms

Default point (d^*) is equal to the sum of short-term debt and half of long-term debt

μ is the expected net return on firm value

σ_V is the standard deviation of market value

T represents at the time (which is set equal to two years).

I follow the research of Vu et al. (2019) to form a baseline model:

$$Y = \beta_0 + \beta_1 RE/TA + \beta_2 SIZE + \beta_3 SOA + \beta_4 LIA/E + \beta_5 Spread + \beta_6 GDP + \beta_7 Exrate + \varepsilon$$

Then, I follow the research of Lin et al. (2013) to add STATE, FOREIGN, BVE/TL, and MV/TE variables to the model:

$$Y = \beta_0 + \beta_1 LIA/E + \beta_2 STATE + \beta_3 FOREIGN + \beta_4 RE/TA + \beta_5 BVE/TL + \beta_6 MV/TE + \varepsilon$$

where:

Y: Distance to default

LIA/E: Liabilities to equity

STATE: State ownership

FOREIGN: Foreign ownership

RE/TA: Retained earnings on total assets ratio

BE/TL: Book value of equity on total liabilities

MV/TE: Market value to total equity

ε: Error term

According to the original research, they use OLS, FEM, REM, and GLS methods. However, FEM, REM methods are prone to multicollinearity, endogenous, autocorrelation, and heteroscedasticity. Therefore, I follow Fenech et al. (2014) and Senior and Bailey (2017) to employ GMM methods to interpret the main results and perform the robustness checks for the before COVID-19 pandemic. Fenech et al. (2014) suggest that the GMM method gives stable, unbiased, and efficient estimation coefficients even under the condition that the endogenous hypothesis is violated. Finally, I employ the OLS method to analyze the results during the Pandemic period due to data limitations.

Empirical findings and Robustness check

Table 1: Descriptive statistics

	Mean	Median	Maximum	Minimum	Std. Dev
Distance to default_3	0.804857	1.345744	20.66399	0.000000	4.113280
LIA_E_3	1.597715	1.035309	14.77409	0.020370	1.904411
STATE_3	0.197161	0.000000	0.795140	0.000000	0.246676
FOREIGN_3	0.022579	0.000403	0.491400	0.000000	0.079362
RE_TA_3	0.058878	0.045760	0.378571	-0.235813	0.075177
BVE_TL_3	2.335349	0.962863	40.94160	0.059483	4.551162
MV_TE_3	0.469090	0.278112	5.871854	0.021148	0.648003

Table 1 reports the descriptive statistics for the independent variables to include the mean, median, standard deviation, minimum and maximum. In this model, the average value of Distance to default is 0.804857, which indicates a high default risk in the Vietnam market. The minimum Distance to default is 0, which indicates a default case. The descriptive statistics showed that the variable LIA_E_3 has an average value is -1.597715. The mean value of state ownership is about 19.7%, while foreign investors hold about 2.25% of ownership in listed firms in Vietnam.

Table 2: Correlation Matrix

	Distance to default_3	LIA_E_3	STATE_3	FOREIGN_3	RE_TA_3	BVE_TL_3	MV_TE_3
Distance to default_3	1						
LIA_E_3	-0.526458	1					
STATE_3	-0.066504	0.095684	1				
FOREIGN_3	0.079179	-0.088613	-0.050284	1			
RE_TA_3	0.417901	-0.327669	0.057128	0.145516	1		
BVE_TL_3	0.539886	-0.313536	-0.104697	0.008260	0.176130	1	

| MV_TE_3 | 0.592132 | -0.284683 | -0.009916 | 0.086829 | 0.331860 | 0.212257 | 1 |

Table 2 shows the correlation coefficient between variables to consider removing factors that lead to multicollinearity (as highly correlated variables). The correlation coefficient between the independent variables with some pairs greater than 0.4 (such as Distance to default_3 and MV_TE_3 is 0.592132) can cause multicollinearity. So, before running the regression model, I use the VIF coefficient to check the multicollinearity again. The results of the VIF coefficient of variables are all less than 2, demonstrates that there is no multicollinearity between the variables in Table 3.

Table 3: Multi-variable regression results (2010-2019)

	VIF	GLS model
LIA_E_3	1.264497	-0.526068 (0.0000)
STATE_3	1.029423	-0.274732 (0.0801)
FOREIGN_3	1.031399	-0.110298 (0.8211)
RE_TA_3	1.246187	8.216303 (0.0000)
BVE_TL_3	1.145678	0.327486 (0.0000)
MV_TE_3	1.180196	2.477298 (0.0000)
C	NA	-2.355089 (0.0000)
Mean	1.149563	
N	4178	4178

Table 4: GMM regression results in pre-COVID-19 (2010-2019)

	Distance to default		Z-Score	
	Coefficient	Prob	Coefficient	Prob
LAG of Dep.Var	0.490640	0.0000	0.261685	0.0000
LIA_E_3	-0.356937	0.0000	-0.025122	0.0301
STATE_3	0.042760	0.8377	0.126377	0.0312
FOREIGN_3	1.134741	0.2679	0.243595	0.1959
RE_TA_3	2.652701	0.0000	1.166787	0.0000
BVE_TL_3	0.216349	0.0000	0.002749	0.5085
MV_TE_3	2.156472	0.0000	0.012927	0.5705
J-statistic	93.35872		79.28435	
Prob (J-statistic)	0.000195		0.014118	
N	3341		2722	

In the pre-COVID-19 pandemic, the GMM method suggests that the dynamic capital structure variable negatively affects the 1% significance level with the default distance. Simply put, a higher leverage ratio leads to a closer Distance to default, which implies higher default risk. This finding is similar toLöffler and Maurer (2011) and Bongini et al. (2000). Bongini et al. (2000) discovered that firms with weak financial positions (high leverage) are more likely to fail, particularly in the case of a financial shock. This might mean that a firm with poor financials is more likely to go bankrupt than usual. Verwijmeren and Derwall (2010) suggest that firms must lower financially leverage to reduce distress risk.

Table 4 also reports a possitive relationship between ownership structure and default distance. For instance, state ownership reduces the distress risks for the listed firms in Vietnam. This result is similar to the findings of Alfaraih et al. (2012). It could be due to the notion that firms with state ownership will have more financial

support and easy access to external financing. Therefore, they are less likely to suffer from distress risks than private firms. Foreign ownership also has a positive impact on the Distance to default. This finding aligns with Baek et al. (2004), Stulz (2009), and Kabir et al. (2020). Foreign ownership has little effect on the risk of default in firms with strong liquidity. This also implies that foreign-invested firms be supported in terms of machinery, sophisticated manufacturing lines, and an experienced management team. Consequently, the firms will have higher business performance and extend their Distance to default.

The remaining variables, such as variable RE_TA, variable BVE_TL, and Tobin's Q (MV_TE), have a positive relationship with the Distance to default. My findings indicate that the retained earnings to total asset ratio is highly correlated with Distance to default at less than 1% significance level. This is the same as the outcome of Tian and Yu (2017). They indicate that firms with high profitability have a lower bankruptcy risk. Similarly, the book value of equity on total liabilities ratio positively correlates with Distance to default. This finding is similar to theory of Altman (2005). Finally, the higher Tobin's Q ratio indicates a higher distance to default because Harney and Tower (2003) the Tobin's Q ratio is a proxy for profitability. Chiang et al. (2015), higher Tobin's Q reduces default risk since better performance increases financial stability. The results are similar to those of Kabir et al. (2020).

In Table 4, I perform additional tests to confirm the robustness of my findings. Specifically, I employ alternative proxies of distress risk such as the Z-scores and liquidity risk (CURRENT_RATIO). Firstly, I follow Elyasiani and Zhang (2015), Li and Miu (2010) test whether the capital structure and ownership structures have robust impacts of default risk, proxied by Z-score. My primary variables, such as capital structure state ownership and foreign ownership, remain the same signs and are all significant.

Table 5: OLS regression results during COVID-19 (2020)

	Distance to default		Z-Score	
	Coefficient	Prob	Coefficient	Prob
LIA_E_3	-0.725723	0.0000	-0.009600	0.6873
STATE_3	0.742056	0.0421	0.462475	0.0011
FOREIGN_3	0.088720	0.9447	0.618300	0.1625
RE_TA_3	7.427900	0.0000	3.432240	0.0000
BVE_TL_3	0.259219	0.0000	-0.027649	0.0001
MV_TE_3	2.699561	0.0000	-0.086546	0.1435
C	-1.691123	0.0000	0.994439	0.0000
N	1052		832	

Table 5 shows the impact of capital structure and ownership structure on the Distance to default during the COVID-19 pandemic. My findings suggest that higher leverage leads to a lower distance to default during the pandemic, and this relationship is statistically significant. My finding is consistent with the research of Bongini et al. (2000), Löffler and Maurer (2011), and Liang et al. (2016). While state ownership and foreign ownership have a positive correlation with Distance to default, only the coefficient of state ownership is significant. It is because the firm with state ownership receives financial support from the governments, so they are unlikely to suffer from distress risk than private or foreign firms. My findings are similar to those of Alfaraih et al. (2012), Baek et al. (2004), Stulz (2009), Kabir et al. (2020) for FOREIGN.

I also perform the robustness check by employing Zscore to proxy for distress risk. My findings indicate that the coefficient of leverage is negative and insignificant. Understandably, the Z-score does not precisely give the results as the Distance to default in the volatile market caused by the COVID-19 pandemic. Howoever, the impacts of state ownership and foreign ownership on Zscore are similar to the results of Distance to default.

Conclusion

The purpose of this article is to test whether the capital structure and ownership structure affect the distress risk of listed non-financial firms in Vietnam. I employ the Distance to default as the primary proxy of distress risk and perform the robustness check with Zscore. My study extends the literature on Distance to default and its

application in a firm's risk management in Vietnam. My study also supports managers in determining effective risk management policies, especially during the Pandemic period.

My main finding suggests that financial leverage has inversed impact on the Distance to default. It is reasonable because higher leverage would cause higher default risks, which reduces the default distance. This finding is comparable to Löffler and Maurer (2011) and Bongini et al. (2000). Secondly, my study figures out that state ownership positively impacts the Distance to default for the period before and during the COVID-19 pandemic. My finding is similar toAlfaraih et al. (2012). While Foreign ownership has a significant and positive influence on Distance to default before the pandemic, the relationship becomes insignificant during the pandemic. My findings are agreeing with Baek et al. (2004), Stulz (2009), and Kabir et al. (2020). My conclusions are robust to changing the dependent variable from distance to default to Zscore.

Based on the findings, I recommend suitable ways to reduce the bankruptcy risk of listed firms in Vietnam. First, the firm must pay careful attention to its leverage ratio. If this indicator is exceptionally high, the firm faces a severe danger of bankruptcy if it is not a state-owned firm. Calling for foreign investments is a good move if the firm plans to develop human resources and expand the market for firms. These investment funds will be highly profitable for the firm (technology, modern production lines, and a team of experienced international managers). In conclusion, my study shows that dynamic capital structure and ownership structure are the elements that significantly impact a firm's distance to default. Further analysis can give extra insight by evaluating the influence of regulatory procedures that are excessively connected to the board of directors and the distance to the default of listed firms in Vietnam.

References

[1] Acosta-Smith, J., Grill, M., & Lang, J. H. (2020). The leverage ratio, risk-taking and bank stability. Journal of Financial Stability, 100833. doi:10.1016/j.jfs.2020.100833

[2] Alfaraih, M., Alanezi, F., & Almujamed, H. (2012). The influence of institutional and government ownership on firm performance: evidence from Kuwait. International Business Research, 5(10), 192-200.

[3] Altman, E. I. (1968). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. The Journal of Finance, 23(4), 589-609. doi:10.1111/j.1540-6261.1968.tb00843.x

[4] Altman, E. I. (2005). An emerging market credit scoring system for corporate bonds. Emerging Markets Review, 6(4), 311-323. doi:10.1016/j.ememar.2005.09.007

[5] Altman, E. I., & Hotchkiss, E. (2010). Corporate financial distress and bankruptcy: Predict and avoid bankruptcy, analyze and invest in distressed debt (Vol. 289). Hoboken, New Jersey: John Wiley & Sons.

[6] Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. Journal of Econometrics, 68(1), 29-51. doi:10.1016/0304-4076(94)01642-D

[7] Bae, J. K. (2012). Predicting financial distress of the South Korean manufacturing industries. Expert Systems with Applications, 39(10), 9159-9165. doi:10.1016/j.eswa.2012.02.058

[8] Baek, J.-S., Kang, J.-K., & Suh Park, K. (2004). Corporate governance and firm value: evidence from the Korean financial crisis. Journal of Financial Economics, 71(2), 265-313. doi:10.1016/S0304-405X(03)00167-3

[9] Beaver, W. H. (1966). Financial Ratios As Predictors of Failure. Journal of Accounting Research, 4, 71-111. doi:10.2307/2490171

[10] Binh, P. V. N., Do, T. T., & Vo, H. D. (2018). Financial distress and bankruptcy prediction: An appropriate model for listed firms in Vietnam. Economic Systems, 42(4), 616-624. doi:10.1016/j.ecosys.2018.05.002

[11] Black, F., & Scholes, M. (1973). The Pricing of Options and Corporate Liabilities. Journal of Political Economy, 81(3), 637-654. Retrieved from http://www.jstor.org/stable/1831029

[12] Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics, 87(1), 115-143. doi:10.1016/S0304-4076(98)00009-8

[13] Bongini, P., Ferri, G., & Hahm, H. (2000). Corporate Bankruptcy in Korea: Only the Strong Survive? Financial Review, 35(4), 31-50. doi:https://doi.org/10.1111/j.1540-6288.2000.tb01428.x

[14] Campbell, J. Y., Hilscher, J., & Szilagyi, J. (2008). In Search of Distress Risk. The Journal of Finance, 63(6), 2899-2939. Retrieved from http://www.jstor.org/stable/20487953

[15] Chiang, S.-M., Chung, H., & Huang, C.-M. (2015). A note on board characteristics, ownership structure and default risk in Taiwan. Accounting & Finance, 55(1), 57-74. doi:10.1111/acfi.12045

[16] Collin-Dufresne, P., & Goldstein, R. S. (2001). Do Credit Spreads Reflect Stationary Leverage Ratios? The Journal of Finance, 56(5), 1929-1957. Retrieved from http://www.jstor.org/stable/2697744

[17] Dangl, T., & Zechner, J. (2004). Credit risk and dynamic capital structure choice. Journal of Financial Intermediation, 13(2), 183-204. doi:10.1016/S1042-9573(03)00057-3

[18] Donker, H., Santen, B., & Zahir, S. (2009). Ownership structure and the likelihood of financial distress in the Netherlands. Applied Financial Economics, 19(21), 1687-1696. doi:10.1080/09603100802599647

[19] Ebrahim, M. S., Girma, S., Shah, M. E., & Williams, J. (2014). Dynamic capital structure and political patronage: The case of Malaysia. International Review of Financial Analysis, 31, 117-128. doi:10.1016/j.irfa.2013.11.004

[20] Elyasiani, E., & Zhang, L. (2015). Bank holding company performance, risk, and "busy" board of directors. Journal of Banking & Finance, 60, 239-251. doi:10.1016/j.jbankfin.2015.08.022

[21] Fan, J. P. H., Huang, J., & Zhu, N. (2013). Institutions, ownership structures, and distress resolution in China. Journal of Corporate Finance, 23, 71-87. doi:10.1016/j.jcorpfin.2013.07.005

[22] Fenech, J.-P., Yap, Y. K., & Shafik, S. (2014). Can the Chinese banking system continue to grow without sacrificing loan quality? Journal of International Financial Markets, Institutions and Money, 31, 315-330. doi:10.1016/j.intfin.2014.03.009

[23] Fich, E. M., & Slezak, S. L. (2008). Can corporate governance save distressed firms from bankruptcy? An empirical analysis. Review of Quantitative Finance and Accounting, 30(2), 225-251. doi:10.1007/s11156-007-0048-5

[24] Ghasemzadeh, M., Heydari, M., & Mansourfar, G. (2021). Earning Volatility, Capital Structure Decisions and Financial Distress by SEM. Emerging Markets Finance and Trade, 57(9), 2632-2650. doi:10.1080/1540496X.2019.1663729

[25] Griffin, J. M., & Lemmon, M. L. (2002). Book-to-Market Equity, Distress Risk, and Stock Returns. The Journal of Finance, 57(5), 2317-2336. Retrieved from http://www.jstor.org/stable/3094513

[26] Gunasekarage, A., Hess, K., & Hu, A. (2007). The influence of the degree of state ownership and the ownership concentration on the performance of listed Chinese companies. Research in International Business and Finance, 21(3), 379-395. doi:10.1016/j.ribaf.2007.02.002

[27] Harney, M., & Tower, E. (2003). Predicting Equity Returns Using Tobin'S q and Price-Earnings Ratios. The Journal of Investing, 12(3), 58-70. doi:10.3905/joi.2003.319555

[28] Hillegeist, S. A., Keating, E. K., Cram, D. P., & Lundstedt, K. G. (2004). Assessing the Probability of Bankruptcy. Review of Accounting Studies, 9(1), 5-34. doi:10.1023/B:RAST.0000013627.90884.b7

[29] Jacoby, G., Li, J., & Liu, M. (2019). Financial distress, political affiliation and earnings management: the case of politically affiliated private firms. The European Journal of Finance, 25(6), 508-523. doi:10.1080/1351847X.2016.1233126

[30] Kabir, M. N., Miah, M. D., Ali, S., & Sharma, P. (2020). Institutional and foreign ownership vis-à-vis default risk: Evidence from Japanese firms. International Review of Economics & Finance, 69, 469-493. doi:10.1016/j.iref.2020.05.020

[31] Kealhofer, S. (2003). Quantifying Credit Risk I: Default Prediction. Financial Analysts Journal, 59(1), 30-44. Retrieved from http://www.jstor.org/stable/4480449

[32] Khaw, K. L.-H., Liao, J., Tripe, D., & Wongchoti, U. (2016). Gender diversity, state control, and corporate risk-taking: Evidence from China. Pacific-Basin Finance Journal, 39, 141-158. doi:10.1016/j.pacfin.2016.06.002

[33] Kliestik, T., Misankova, M., & Kocisova, K. (2015). Calculation of Distance to Default. Procedia Economics and Finance, 23, 238-243. doi:10.1016/S2212-5671(15)00481-5

[34] Li, L., & Faff, R. (2019). Predicting corporate bankruptcy: What matters? International Review of Economics & Finance, 62, 1-19. doi:10.1016/j.iref.2019.02.016

[35] Li, M.-Y. L., & Miu, P. (2010). A hybrid bankruptcy prediction model with dynamic loadings on accounting-ratio-based and market-based information: A binary quantile regression approach. Journal of Empirical Finance, 17(4), 818-833. doi:10.1016/j.jempfin.2010.04.004

[36] Li, Z., Crook, J., Andreeva, G., & Tang, Y. (2020). Predicting the risk of financial distress using corporate governance measures. Pacific-Basin Finance Journal, 101334. doi:10.1016/j.pacfin.2020.101334

[37] Liang, D., Lu, C.-C., Tsai, C.-F., & Shih, G.-A. (2016). Financial ratios and corporate governance indicators in bankruptcy prediction: A comprehensive study. European Journal of Operational Research, 252(2), 561-572. doi:10.1016/j.ejor.2016.01.012

[38] Lin, C., Ma, Y., Malatesta, P., & Xuan, Y. (2013). Corporate ownership structure and the choice between bank debt and public debt. Journal of Financial Economics, 109(2), 517-534.

[39] Löffler, G., & Maurer, A. (2011). Incorporating the dynamics of leverage into default prediction. Journal of Banking & Finance, 35(12), 3351-3361. doi:10.1016/j.jbankfin.2011.05.015

[40] Mensah, Y. M. (1984). An Examination of the Stationarity of Multivariate Bankruptcy Prediction Models: A Methodological Study. Journal of Accounting Research, 22(1), 380-395. doi:10.2307/2490719

[41] Merton, R. C. (1974). On the Pricing of Corporate Debt: The Risk Structure of Interest Rates. The Journal of Finance, 29(2), 449-470. doi:10.2307/2978814

[42] Miller, W. (2009). Comparing models of corporate bankruptcy prediction: Distance to default vs. Z-score. Morningstar, Inc.

[43] Ohlson, J. A. (1980). Financial Ratios and the Probabilistic Prediction of Bankruptcy. Journal of Accounting Research, 18(1), 109-131. doi:10.2307/2490395

[44] Outecheva, N. (2007). Corporate financial distress: An empirical analysis of distress risk. (PhD Dissertation). University of St.Gallen, Graduate School of Business Administration, Economics, Law and Social Sciences (HSG), Switzerland.

[45] Reisz, A. S., & Perlich, C. (2007). A market-based framework for bankruptcy prediction. Journal of Financial Stability, 3(2), 85-131. doi:10.1016/j.jfs.2007.02.001

[46] Senior, A., & Bailey, S. A. (2017). Estimating and Forecasting Default Risk: Evidence from Jamaica. Monetaria(1), 133-162.

[47] Stulz, R. M. (2009). Global Corporate Governance. In H. C. Donald & L. G. Stuart (Eds.), 6. Globalization, Corporate Finance, and the Cost of Capital (pp. 106-134): Columbia University Press.

[48] Tian, S., & Yu, Y. (2017). Financial ratios and bankruptcy predictions: An international evidence. International Review of Economics & Finance, 51, 510-526. doi:10.1016/j.iref.2017.07.025

[49] Verwijmeren, P., & Derwall, J. (2010). Employee well-being, firm leverage, and bankruptcy risk. Journal of Banking & Finance, 34(5), 956-964. doi:10.1016/j.jbankfin.2009.10.006

[50] Vu, V. T. T., Do, N. H., Dang, H. N., & Nguyen, T. N. (2019). Profitability and the Distance to Default: Evidence from Vietnam Securities Market. The Journal of Asian Finance, Economics, and Business, 6(4), 53-63.

[51] Zeitun, R., & Gang Tian, G. (2007). Does ownership affect a firm's performance and default risk in Jordan? Corporate Governance: The international journal of business in society, 7(1), 66-82. doi:10.1108/14720700710727122

[52] Zmijewski, M. E. (1984). Methodological Issues Related to the Estimation of Financial Distress Prediction Models. Journal of Accounting Research, 22, 59-82. doi:10.2307/2490859