JURNAL
Riset Akuntansi dan Keuangan Indonesia
URL : http://journals.ums.ac.id/index.php/reaksi/index

Impact of Corporate Social Responsibility on Vietnamese Listed Firm's Financial Distress Risk

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ABSTRACT
The research focuses on examining the impacts of corporate social responsibility (CSR) on the financial distress risk of 50 Vietnamese-listed firms in the plastic-chemical production industry from 2019 to 2023. The research performs some regression models such as OLS, FEM, and REM, then inspect and overcome the defects of the model. The results indicate that social responsibility scores at Vietnamese enterprises tend to increase, especially after the COVID-19 pandemic, and the more businesses comply with CSR criteria, the more likely it will reduce the financial distress risk. However, CSR targets have not been implemented uniformly, posing strategic policies needed to overcome and more strongly promote CSR within Vietnam.

Keywords:
Corporate social responsibility, financial distress risk, Vietnamese-listed firms

INTRODUCTION

The financial distress risk (FDR) has long been one of the most important concerns of businesses when it comes to operations. Especially after the 2008 financial crisis, the financial difficulties of businesses highlighted the problem of governance as well as prevention and response to FDR. Most previous empirical research on FDR has focused on the forecast ability and cash flow of investment businesses, with data collected from financial statements (Altman et al., 2000); (Ohlson, 1980) and (Zmijewski, 1984). However, as the topic has grown, the research of Deng & Wang (2006), and Fich & Slezak (2008) has argued that the mere use of accounting data is not enough to ensure FDR's predictability and proposed the addition of a group of corporate governance factors.

Indeed, when the COVID-19 pandemic hit, disrupting the supply chain of many of the world's commodity products, stalling production and business, severely affecting the economy, the study of Nguyen Thanh Tung (2020) has shown that this pandemic increased the risk of financial distress of surveyed enterprises in Ho Chi Minh City by 1.55 – 2.25 times. Actual data shows that the rate of bankrupt enterprises in increased sharply during that period, reaffirming that enterprises only focus on investment business activities, profits are not enough but also must focus on financial risk prevention activities. In addition to the use of financial data, the incorporation of non-financial information is necessary and urgent in the new era.

Currently, one of the most interesting non-financial types of information is the sets of indicators on sustainable development and social responsibility. In the world, this is no longer a strange concept and has become an indispensable factor, in parallel with the development of the business economy. Implementing social responsibility requires businesses to change the prerequisite goal of maximizing profits and shareholder benefits, instead, they need to balance the interests of stakeholders. However, in Vietnam, this concept is still new and has not been focused on by businesses with its importance. Though, Vietnam is not out of the trend, and is gradually developing policies and regulations aimed at economic development but accompanied by corporate social responsibility.

To fill the gap in the current literature, we investigate the impact of corporate social responsibility on the risk of financial distress by using panel data including 50 plastic-chemical production firms in the Vietnam stock market from 2019 to 2023. The research contributes significantly to the existing literature by unveiling a compelling relationship between corporate social responsibilities and financial distress risk. It appears that the more corporations implement CSR, the lesser the risk of financial distress they could face. Moreover, a noteworthy finding emerges when we explore different aspects of CSR, indicating that there are different concerns and investments among aspects of CSR implementation.

This study is organized in the following manner. Firstly, we examine the theoretical framework and relevant studies on the impact of CSR on FDR. Subsequently, section 3 explains the methodology for sample selection and the generation of variables. In section 4, a thorough analysis and discussion of my empirical findings are conducted. This study concludes with an extensive examination and final remarks in section 5.

LITERATURE REVIEW

Theoretical framework

The term corporate social responsibility officially appeared when H.R. Bowen (1953) published his book "Social Responsibilities of the Businessmen" aimed at propaganda and urging property managers not to harm the rights and interests of others, appealing to charity to reimburse businesses for damages caused by businesses harming society. Maignan and Ferrell (2004) believe that a business is socially responsible when its decisions and activities are aimed at creating and balancing the different interests of the individuals and organizations involved. Sheehy et all (2014) considered social responsibility as an activity of "self-regulation in business by international private enterprises". Hopkins (2012) similarly "Social responsibility is concerned with behaving ethically with the stakeholders of a business, these stakeholders exist inside and outside the business and the goal of social responsibility is to improve the quality of life of its stakeholders while maintaining the profitability of the business." This definition raises two issues that need to be clarified: "ethics"

p-ISSN:1411-6510
e-ISSN :2541-6111

and "stakeholders". Ethical behavior depends on the perspective of the person evaluating that behavior and is difficult to determine accurately. Who stakeholders include causes a lot of debate but can list a few subjects such as: Inside the business - Board of Directors, shareholders and employees; Outside the business – Suppliers, customers, environment, Government and community. Thus, the concept of CSR proposed by (Hopkins, 2012) shows coverage of issues of interest of the parties, both inside and outside the business.

Financial distress is a rather obscure term that can be attributed to four terms that describe the financial condition of a business: failure, insolvency, bankruptcy, and default (Altman & Hotchkiss, 2010). Ross at all (1999) point out that financial difficulties occur when an enterprise finds itself in the following situations: first, business failure, i.e. the enterprise's inability to repay outstanding debts after asset liquidation; secondly, specific statutory bankruptcy is one of the creditors or the enterprise itself filing an application to the Court requesting to carry out bankruptcy procedures; thirdly, technical bankruptcy, the enterprise's inability to fulfill debt repayment obligations for principal and interest debts; Fourth, bankruptcy on the books means that the net asset value of the enterprise is a negative number. In countries where economies have a deep government intervention such as China and Vietnam, financial distress is usually determined based on a certain degree of deterioration of financial capacity dictated by stock market regulators. For example, some listed companies are placed under special control by the China Stock Exchange for negative after-tax profit for two consecutive years or net asset value per share below the par value of shares (Sun & Hui, 2006; Ding et all, 2008; Sun, Jia, et all, 2011). Also, Sun, He, at all (2011) propose the concept of relative financial distress, which is the deterioration of the financial condition at one point of the enterprise that occurs during the life cycle of the enterprise itself.

The relationship between CSR and FDR could be explored based on some fundamental theories. *Legality theory* is at the heart of social contracts, in which firms have contracts with the whole society (Dowling and Pfeffer, 1975). The social contract is represented by societal expectations (Shocker and Sethi, 1973), which are not fixed and change over time (Islam and Deegan, 2008). The ethical obligation of enterprises is to meet the expectations of members of society. Only legal enterprises have the right to use the natural and human resources of society (Mathews, 1995). Thus, organizations are required to meet the changing expectations of society (Islam and Deegan, 2008) to maintain their legitimacy. According to this theory, CSR can be used by enterprises as a tool to communicate information about their activities and activities (practices) to meet society's expectations to maintain a license to operate in society (legality).

Gary Odonovan (2006) states that the majority of current research points to why companies publish environmental information in annual reports due to legitimate theory, which is one of the explanations for the increase in environmental disclosure, since the early 1980s. Formal theory is based on the idea that to continue to operate successfully, companies must act within the sphere of society that is aware of socially acceptable behaviors.

According to Deegan (2002), the theory of legitimacy is based on the view that the rights and responsibilities of the organization must come from society. Business organizations must operate within the boundaries of society to meet societal expectations, including the provision of better goods and services to society. Because organizations are part of a broader social system, organizations need to function within the social system, without any negative impact on society. This can make the organization achieve goals and stable profitability.

Stakeholder theory explains the relationship between company operations and stakeholders formulated by author Friedman in the 1970s. According to this theory, the enterprise is considered a subject in a large collective with many components. Then, the company operates not only to maximize profits for shareholders but also to pay attention to and consider the parties involved in the operation of the business. Stakeholders of the business (Freeman, 1984), internally speaking, include shareholders, employees, board of directors, management, ... In terms of external aspects, it can be mentioned customers, suppliers, society, community, media, Government, and other important organizations.

The relationship between stakeholder theory and CSR is that they both emphasize incorporating the benefits of society into the business goals of the business. Stakeholder theory holds that the essence of business lies in building relationships and creating value for parties. All of these stakeholders are of equal importance to the business and any benefit trade-offs between the parties should be avoided. Instead, management should find ways that these interests can be directed toward the same goal, an issue that requires good governance skills. Altman & Hotchkiss (2010) argues that one of the reasons businesses face FDR is due to poor management skills. Attig et al. (2013) said that businesses that focus on CSR often have high credit ratings. A result that helps increase the sustainability of production and business activities of enterprises. This is also a sign of the good management capacity of the management board through the efficient use of resources and the reduction of costs incurred due to irresponsible acts towards society. Credit rating agencies positively rate CSR activities for sustainable improvements in production and business activities and help reduce FDR (Attig et al., 2013). Furthermore, the disclosure of information on CSR activities helps raise awareness of ethical compliance and risk management, thereby providing information that helps predict the possibility of corporate cash flow growth in the long term.

Empirical researches

Most of the research indicates the positive impact of CSR on FDR, and the results could be explained by two main mechanisms. *First, CSR can reduce enterprise risk and thereby invoke an inverse correlation with FDR.* Jo & Na (2012) provide evidence showing an inverse correlation between CSR and enterprise risk, reinforcing the hypothesis of risk mitigation. Lee & Faff (2009) argue that businesses implementing CSR have lower specific risks due to better market portfolio efficiency. Some studies provide results based on empirical research that being responsible to stakeholders reduces the unique risks of enterprises (Boutin Dufresne and Savaria, 2004; Sharfman and Fernando, 2008). Environmental, social, and community responsibility can help businesses create a positive reputation and ethical capital with their stakeholders (Godfrey, 2005; Godfrey, Merrill, and Hansen, 2009), ensuring that these businesses are less vulnerable in the event of a community-related crisis (Peloza, 2006).

Furthermore, the implementation of CSR encourages the maintenance of long-term stable relationships with local communities and governments, which helps avoid the risk of litigation from local communities and increases government oversight (McGuire, Sundgren, and Schneeweis, 1988). The implementation of CSR benefits stakeholders, such as employees, lenders, and suppliers (Waddock and Graves, 1997), and strengthens the relationship between them and the business (Fombrun and Shanley, 1990), thus improving the sustainability of the business (Lengnick-Hall, 1996). Accordingly, CSR is used to improve the business environment and minimize risks for enterprises.

Second, CSR enhances the image of the business and improves access to capital attraction channels that help minimize FDR. Sharfman and Fernando (2008), and El Ghoul et al. (2011) provide evidence that the higher a business has a CSR, the lower its cost of capital because of perceptions that its risk is low. Using credit grant data in the US, Goss & Roberts (2011) suggested that enterprises implementing CSR enjoy lower credit interest rates than other businesses. Attig et al. (2013) point out that rating agencies often value businesses that implement CSR. These organizations consider CSR information as non-financial information in the process of implementing corporate credit ratings. Jiraporn et al. (2014) provide evidence that increasing one standard deviation in the Social Responsibility index results in a 4.5% increase in credit ratings and thereby reduces the risk of corporate default. Summarizing the above empirical studies, it can be seen that enterprises participating in CSR implementation are rated with high credit ratings and thereby easily access funding channels in the financial market.

Nguyen and Nguyen (2015) mentioned that investors can assign a higher level of risk to companies with higher CSR indexes, as CSR-focused companies oriented towards too many different stakeholders may be more vulnerable to economic shocks. In other words, focusing on stakeholders can increase your risk level. In contrast, the research paper of Tran Trieu Anh Khoa (2023) points to the opposite relationship, studying 294 listed non-financial enterprises between 2016 and 2022 shows that the implementation of social responsibility has an impact on reducing the risk of financial distress. Similarity, Le Thi Phuong Uyen and Nguyen Thanh Dat (2023), which tracked 2145 companies in the US from 2002 to 2021, said that socially responsible companies are often more transparent in disclosing

p-ISSN:1411-6510
e-ISSN :2541-6111

information, so that asymmetric information is minimized and risks of businesses are reduced. In addition, Nguyen Thi Hoa Hong's research paper (2022) with 780 listed enterprises in Vietnam in the period 2010-2021 also showed similar results, showing that businesses with effective CSR programs through high CSRD scores will reduce risks in businesses.

However, the research results still have a lot of gaps, especially in developing countries like Vietnam. The heterogeneity in corporate sustainability policies has created several systemic problems and caused difficulties in CSR assessment. Although CSR has similar qualitative and quantitative measurement criteria, the effects obtained from CSR implementation in enterprises are not the same (Chatterji et al., 2016;). In addition, businesses can also take advantage of the lack of standardization in CSR measurement to try to facilitate and raise CSR scores to increase brand value and beautify the image of the business. Thus, the absence of a formal system will affect the results of CSR assessment among enterprises, causing the ability to inaccurately reflect the implementation of social responsibility between enterprises. Besides, , the use of non-financial data in the FDR research model is new and mostly focuses on corporate governance and board structure (Elloumi & Gueyié, 2001; Deng & Wang, 2006), there has not been much research on the relationship between social responsibility and corporate financial risk.

With the theoretical framework and literature review mentioned above, in this study, the authors attempt to determine how CSR implementation is related to the risk of corporate financial distress. To assess the impact of CSR on the risk of financial distress of enterprises, the research paper considers based on the strategic vision of the management, the responsibility of the business in 4 aspects: environment, labor, community, and products. In addition, to measure the risk of corporate financial distress, the essay uses the Z-score developed by Altman (1968), which is calculated based on many financial indicators of the enterprise such as working capital, total assets, liabilities, revenue, ...

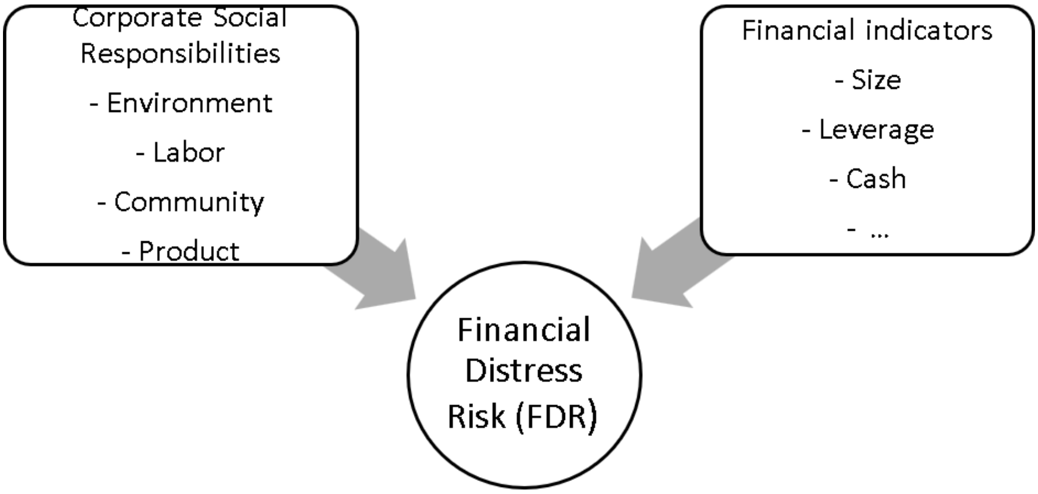

Figure 1. Study framework of the impact of CSR on FDR
(Source: Authors constructed)

RESEARCH METHODOLOGY

Sample selection

When researching the impact of CSR on the risk of corporate financial distress in the Vietnamese market, the research paper selected enterprises in the plastic-chemical industry. The purpose of the paper is to assess the impact of CSR on companies with a high level of environmental impact. Accordingly, companies with a high level of environmental impact will have to take responsibility as well as take more actions and invest in the environment to minimize their impacts, which will be fully reported in the company's annual report. In addition, to be able to ensure research data, companies must have full financial data in their financial statements for the period 2019-2023. Moreover, the information about CSR will be collected by the author in the ESG report, annual report, and media to calculate the score. The research sample is 50 enterprises in the plastic–chemical production industry listed on the Vietnam stock market from 2019 to 2023, the author has eliminated enterprises that have not posted information about the annual report in 2023 and selected enterprises with full information instead.

Model and variable construction

Based on data from previous research papers on the impact of CSR on the risk of corporate financial distress, combined with the variables studied by the author to feed into the model. The author gives the model with 1 dependent variable, 1 independent variable, and 7 control variables, which looks like:

$$FDRit = {}_{0it} + CSR_{it} + SIZE_{it} + LEV_{it} + CASH_{it} + ROA_{it} + R\&D_{it} + QUICK_{it} + LOSS_{it} +$$

Dependent variable. The thesis uses an index measuring the risk of financial distress based on accounting data as the Z_score indicator of (Altman, 1968) - the higher the Z_score the lower the risk of financial distress:

$$Z\_score = 0.012 * + 0.014 * + 0.033 * + 0.006 * + 0.999 *$$

Which: WC is the difference between current assets and current liabilities, TA is total assets, RE is retained earnings, EBIT is earning before tax and interest, MV is market capitalization, TL is total liabilities, and SAL is net revenue. Altman (1968) argues that when the Z_score > is 2.67, the business is in good financial shape and assesses that the business is not financially distressed in the future. Z_score index scores in the zones of 1.81 and 2.67 imply that the business did not have financial problems at the time of the assessment but will fall into financial distress shortly. If the index Z_score < 1.81, then the enterprise is in financial distress and at high risk of bankruptcy. Thus, the higher the Z_score index, the more beneficial it is for the business, and is in the danger zone when it reaches 1.81 or below.

Independent variable. CSR is measured based on qualitative methods. The study will be based on the CSR scoring by the research of Ho Thi Van Anh (2017), dividing the CSR group into 4 different indicators, including environmental with 8 criteria, employee responsibility with 6 criteria, community responsibility with 5 criteria, and product responsibility with 4 criteria. Details is shown in the appendix. The evaluation criteria of the four component CSR contents will be encoded with a binary value, receive a value of 1 if the information in the financial statements shows that the enterprise has mentioned criteria in the corresponding content, and receive a value of 0 in the remaining case left. Then, the CSR index is calculated by an unweighted method, whereby the total CSR score of each component is the average of the criteria in that component and the total CSR score of the enterprise is the average of the CSR score of each component (Ho Thi Van Anh, 2017). The formula is as follows:

$$\text{Component CSR Index}_{ij} = \frac{\Sigma_{i=1}^{k} criteria\ CSRij}{N_{ij}}$$

$$\text{Total CSR}_{\text{index ij}} = \frac{\Sigma_{i=1}^{4} component\ CSR\ index\ ij}{4}$$

Which:

- CSR_{ij}: get a value of 1 if the information related to the CSR criterion component i of enterprise j has published information, the opposite is 0.
- N_{ij}: Number of component CSR criteria i for business j.

Control variables. The financial index variables used as control variables in the regression model are selected based on a review of relevant studies, including: Size of total assets, financial leverage, research and development capacity, cash holding capacity, liquidity, profitability. Details are shown in the table below.

p-ISSN:1411-6510
e-ISSN :2541-6111

Table 1. Summary variables in the research

Variables	Symbol	Formula		Author
Dependent variable				
Financial distress risk	FDR	Z-score= 0.012A + 0.014B + 0.33C + 0.006D + 0.999E A= Working Capital/Total Assets B = Retained Earnings/Total Assets C = Profit before tax and interest/Total assets D = Market Cap/Liabilities E = Net revenue/Total assets		
Independent variable				
Corporate Social Responsibility	CSR	Total $CSR_{index\ ij} = \frac{\Sigma_{i=1}^{4} component\ CSR\ index\ ij}{4}$ Component CSR $Index_{ij} = \frac{\Sigma_{i=1}^{k} criteria\ CSRij}{N_{ij}}$	+	Jo & Na (2012), Lee & Faff (2009)
Control variables				
Size	SIZE	Logarit total assets	+	Donker et al (2009)
Financial leverage	LEV	The ratio of liabilities to total assets	-	Shumway (2001)
Cash	CASH	The ratio of cash and cash equivalents to total assets	+	Tran Trieu Anh Khoa (2022)
Return on asset	ROA	The ratio of after tax profit to total assets	+	Nguyen Thuy Linh (2022)
Quick	QUICK	(Current assets – Inventory)/Current liabilities	+	Tran Trieu Anh Khoa (2022)
Research and development	R&D	The ratio of investment and development funds to total assets	-	Zhang (2015)
Possibility of loss	LOSS	The variable takes the value 1 if the profit after tax is negative and takes the value 0 in the opposite case	-	Tran Trieu Anh Khoa (2022)

(Source: Authors compilation)

RESEARCH METHODOLOGY

There are two main methods, quantitative methods and qualitative methods. According to Jones (1995), there is no significant distinction between these two methods, and these two methods are considered complementary. Hoepfl (1997) points out that researchers use quantitative measures to test research hypotheses. In addition, quantitative studies emphasize the measurement and analysis of causal relationships between variables (Denzin and Lincoln, 1998). In this paper, the author investigates the relationship between CSR implementation and the risk of financial distress of the business, including the measurement of relevant indicators. Therefore, the paper using quantitative methods is the main method in this study.

In addition, qualitative methods are also used by the author to search, analyze and code based on relevant domestic and foreign studies to come up with variables. In particular, to be able to evaluate the CSR score, the author has collected CSR information disclosure data of listed enterprises in the plastics–chemicals industry group based on annual reports and sustainable development reports.

Besides, according to the theoretical frameworks and empirical studies mentioned above, the research states the hypothesis that there exists a positive relationship between CSR implementation and financial distress risk.

RESULTS AND DISCUSSION

Current situation of CSR implementation

It can be seen that composite CSR scores tend to increase over time from 2019 to 2023, the 2020 timeline is a year with a marked change compared to other years. The explanation for this can be that the issuance of Circular 155/2015-BTC of the Ministry of Finance in 2015, applied from January 1, 2016, for the first time regulating the disclosure of information on social responsibility has made businesses more obliged to implement and disclose information. However, because it is still a new topic, the implementation of corporate social responsibility has not been widely disseminated and still has many shortcomings, so the CSR implementation index is not high. Since 2020, under the strong influence of the COVID-19 pandemic, causing heavy damage to the economy, society has gradually paid more attention to environmental issues, communities, and stakeholders, requiring businesses to change to catch up with the market. In particular, internationally, the implementation of corporate social responsibility has been focused for a long time, to be able to trade internationally as well as keep up with the current integration trend, businesses have gradually invested more in the implementation of CSR. Thereby, we can see the trend of investment in CSR of enterprises increasing gradually over the years, and especially being paid more attention when our country began to be negatively affected by the COVID-19 pandemic.

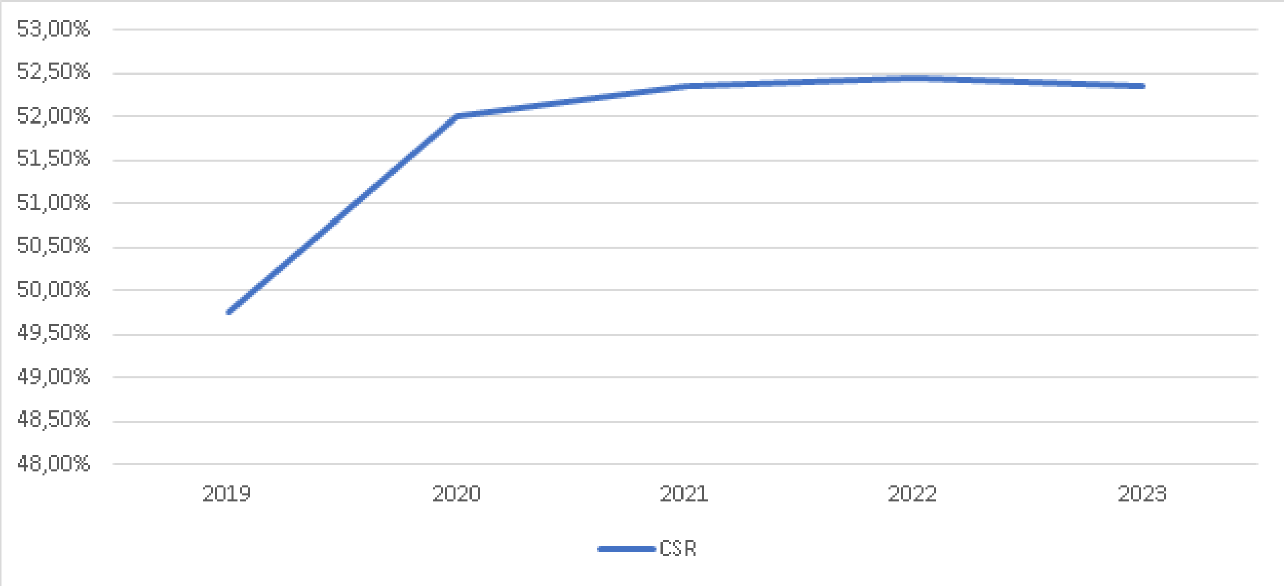

Figure 2. The current situation of CSR implementation over the years

(Source: Author calculation)

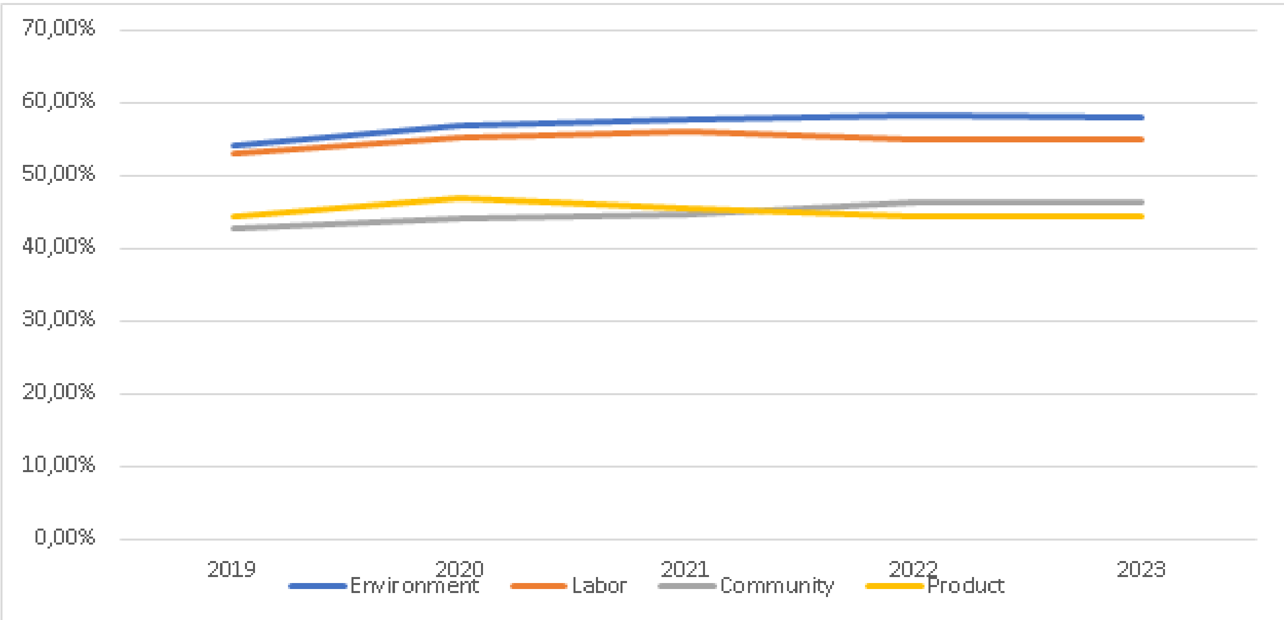

Figure 3. Current situation of CSR implementation by different groups

(Source: Author calculation)

p-ISSN:1411-6510
e-ISSN :2541-6111

Figure 3 shows the implementation of social responsibility according to each indicator group of enterprises, including Environment, Labor, Community, and Products. Accordingly, we see that businesses have not invested evenly in each indicator. In particular, the target on labor and environment has the best result, while the target on Products and Community is low. In terms of trends and annual growth, the group of environmental and community indicators has a more regular and steady growth, in contrast to labor and product group have a downward trend recently.

RESEARCH RESULT

Descriptive summary

Table 2 describes the mean, standard deviation, minimum, and maximum values of the variables studied in the model from 2019 to 2023. From the descriptive statistical table, we can derive the average value of the 5-year financial distress risk index of companies in the plastic-chemical industry group is 1.865961, this index is considered relatively low and has exceeded the permissible safety threshold. In particular, the lowest Z_score value is 0.1234838, and the highest reaches 13.96394.

Table 2. Statistics describing the variables used in the research model

Variable	Obs	Means	Std.dev.	Min	Max
Z_score	250	1.865961	2.282469	0.1234838	13.96394
Size	250	11.93127	0.7048323	10.75824	13.9046
Leverage	250	0.4152018	0.1882879	0.0245845	0.802374
Cash	250	0.0969559	0.1160861	0.0011861	0.6535248
ROA	250	0.0654625	0.074915	-0.1893656	0.45037
Quick	250	1.713522	1.531516	0.1775028	9.768665
R&D	250	0.0985736	0.1094455	0	0.4705669
Loss	250	0.044	0.2055065	0	1
CSR	250	0.5173043	0.1954424	0.173913	0.9565217

(Source: Author calculation)

The average value of CSR – social responsibility index reached 0.5173043 (equivalent to about 51.73%), showing that the implementation rate of corporate social responsibility is not high and has only reached half of the set requirements. In addition, the smallest value of this indicator is 0.173913 while the largest value is 0.9565217, indicating that the implementation of corporate social responsibility can possibly have a large difference.

Table 3. Correlation coefficient between variables in the model

	Z_score	Size	Leverage	Cash	ROA	Quick	R&D	Loss	CSR
Z_score	1								
Size	-0.2769	1							
Leverage	-0.1729	0.1601	1						
Cash	0.5888	-0.1935	-0.3428	1					
ROA	0.1275	0.0636	-0.4482	0.2358	1				
Quick	0.1147	-0.1088	-0.6903	0.3850	0.3525	1			
R&D	-0.0555	-0.0999	-0.4054	0.1702	0.3558	0.4073	1		
Loss	-0.0810	-0.0374	0.0729	-0.1051	-0.3887	-0.0750	-0.0348	1	
CSR	0.6837	-0.0710	-0.0413	0.4996	0.2935	0.0565	-0.0472	-0.1711	1

(Source: Author calculation)

The results of Table 3 show that the CSR index has a positive correlation with Z_score, which suggests that the higher the implementation of social responsibility, the lower the impact on reducing the risk of corporate financial distress, which is consistent with the results of previous studies (Al-Hadi et al., 2019; Boubaker &; ctg, 2020). In addition, the presentation of the correlation coefficient matrix also aims to detect linear multicollinearity between CSR variables, Z_score variables, and financial index variables. The correlation coefficients of the explainer variables are mostly below 0.5, indicating there is no serious case of multicollinearity.

Regression result

After examination, there is no concern case of multicollinearity, the authors use Stata 17 to perform a regression model.

Table 4. Regression results for the impact of CSR on FDR

	Pooled OLS	FEM	REM
CSR	6.366***	0.643	3.205***
	(10.78)	(0.78)	(4.61)
Size	-0.536***	-0.943**	-0.846***
	(-3.92)	(-2.17)	(-3.45)
Leverage	-2.028***	-0.0564	-0.470
	(-2.76)	(-0.08)	(-0.70)
Cash	5.950***	1.867**	2.938***
	(5.78)	(2.26)	(3.56)
ROA	-3.148*	0.895	0.256
	(-1.91)	(0,84)	(0.24)
Quick	-0.138	-0.0733	-0.0975
	(-1.58)	(-1.08)	(-1.42)
R&D	-1.901*	-0.276	-1.123
	(-1.94)	(-0.21)	(-0.97)
Loss	-0.00228	0.0477	0.0589
	(-0.00)	(0.17)	(0.20)
Cons	5.923***	12.73**	10.50***
	(3.54)	(2.43)	(3.52)
N	250	250	250
R2	0.607	0.271	0.535
Prob > F	0.0000	0.1530	0.0000
Hausman Accreditation		0.0000	
F test	0.0000		
Breusch-Pagan Accreditation			0.0022

t statistics in parentheses
* p<0.1, **p<0.05, ***p<0.01
(Source: Author calculation)

The study carried out ordinary least squares (Pooled OLS), fixed effect model (FEM), and random effect model (REM), respectively. To be able to verify the conformity between the OLS model and the random effect model (FEM), the author uses the F test. The results of the F test show that Prob>F = 0.00% is less than 5%, so a random effect model is more suitable for study than the OLS model. Next, the author uses the Breusch-Pagan test to verify the suitability of the Pooled OLS model and the random effect model (REM). After testing, the author found that the random effect model

p-ISSN:1411-6510
e-ISSN :2541-6111

(REM) was more suitable for study than the Pooled OLS model because Prob > chibar2 = 0.22% is less than 5%. Finally, to find the most suitable model to study, the author continued to test Hausman for two models FEM and REM. The test results showed that the fixed effect model (FEM) was the most suitable sub-model to study with Prob > F = 0.00% less than 5%. This means that the independent variables and control variables introduced into the model can explain the variability of the dependent variable.

Afterward, the research inspects and discovers the research model has both defects of heteroskedasticity and autocorrelation. Therefore, the research continues to use GLS model to overcome the defects and the final result is shown as below.

Table 5. Final result of the impact of CSR on FDR

Prob > chi2 = 0.000				
Z_score	**Coefficient**	**Std. err.**	**with**	**P > |z|**
CSR	3.201982	0.2736662	11.70	0.000
Size	-0.5006617	0.0798519	-6.27	0.000
Leverage	-0.1403184	0.2207405	-0.64	0.525
Cash	0.4146859	0.4659953	0.89	0.374
ROA	0.909662	0.4752139	1.91	0.056
Quick	-0.0671992	0.0243184	-2.76	0.006
R&D	-0.5867883	0.3707516	-1.58	0.113
Loss	-0.1142113	0.0630184	-1.81	0.070

(Source: Author calculation)

Table 5 provides regression results verifying the correlation between FDR and CSR through the generalized least squares estimation (GLS) method. The results showed that CSR had a positive and statistically significant effect with the FDR measurement Z_score variable with p-vaue < 0.01. In other words, the higher the CSR, the lower the risk of corporate financial exhaustion. These results are completely consistent with related studies (Al-Hadi et al., 2019; Boubaker &; ctg, 2020) argue that businesses that emphasize social responsibility in their business activities often have high accountability ratings (Attig &; ctg, 2013) and are more favorable in accessing funding channels (Cheng et al., 2014). Thus, the regression results in table 5 have provided the answer to the research question as well as the research hypothesis: *There exists a relationship between CSR and FDR, in which CSR has a positive impact on reducing FDR for businesses.*

The Size variable has a positive and statistically significant correlation with the Z_score, which is different from the study conclusions of Al-Hadi et al. (2019) but agrees with the results of Boubaker et al. (2020). The ROA variable reflects the asset management ability and performance of the business with a positive regression coefficient reflecting a positive and statistically significant correlation with the Z_score. Shows that the business has good management ability and high asset utilization efficiency, the lower the FDR. Variables such as Quick and Loss are negatively correlated with the Z_score index, showing that if the company has a higher quick payout ratio and a high loss ratio, it will lead to a higher risk of corporate bankruptcy. The problem can be explained by if the Quick index is too high to reflect the liquidity of the enterprise is good, because it may be due to financial resources not being used properly, working capital turnover is low, capital efficiency is not high; Loss index shows loss results, if the enterprise has prolonged operating results, it will increase the risk of bankruptcy.

Besides, the regression coefficient of Leverage, Cash, and R&D variables although the author found that there is a relationship with FDR. However, the p-value of these variables is very high so from the regression results, there is no statistical significance. It can be concluded that Leverage, Cash, and R&D variables are not associated with the risk of corporate financial distress.

CONCLUSIONS

The CSR impact study on FDR uses a sample of 50 plastic-chemical enterprises listed on the Vietnamese stock market in the period 2019-

2023. Linear regression models are used with OLS, FEM, REM, and FGLS estimation methods. Tests of multicollinearity, heteroskedasticity, and autocorrelation are fully performed to provide the most accurate and efficient estimation possible. The CSR measurement variable is calculated based on the method of analyzing the contents of four aspects of CSR including Environment, labor, communities, and products recorded in the sustainable development information section of the financial statements that enterprises announce annually. This measurement is used to ensure that the CSR reflects the overall social responsibility of the business to its stakeholders. The results provide evidence that CSR has an impact on reducing FDR. This research result also helps to reinforce the view of Stakeholder Theory, which believes that in addition to the goal of profit and maximizing shareholders' benefits, the role and responsibility of businesses to society and stakeholders is gradually becoming an important issue that businesses need to pay attention to in the process of business operations his joint (Tran Trieu Anh Khoa, 2022).

Besides, the investment in CSR in business activities is becoming a new trend with significant importance for the financial performance of the company as well as a positive contribution to reducing company risks in the current situation of Vietnam's economy. This shows that, in addition to using traditional methods, managers also need to include CSR in the process of improving the value and efficiency of the company. Interest in CSR is increasing among businesses in all different business sectors. Therefore, the application of CSR to business activities in the period of international market integration is extremely important because it brings mutual benefits, both to the organization and society. In particular, this contributes positively to increasing the competitiveness of companies listed on the stock exchange. In conclusion, there is a need for actions and policies to motivate organizations to participate in the implementation of CSR reporting, requiring the involvement of many other parties, not only the business itself but also the actions of regulators and the government.

The thesis has certain limitations. First, the new research sample only includes listed non-financial enterprises, especially only in 1 group of plastic-chemical industries, ignoring financial institutions such as banks. In the context of Vietnam's stock market, more than 40% of the top listed enterprises listed in the VN30 index basket are Banks (13/30) (Ho Chi Minh City Stock Exchange). HCMC, 1/2024), the role of financial institutions has significant influences on sustainable development goals. This is also a necessary research direction that expands consideration. In addition, the research data of the thesis collected from 2019 to 2023 is relatively short, but the thesis cannot increase the time due to data supply limitations and this is also an opportunity for future studies to test the impact between CSR activities and FDR problems in the study sample with a longer duration. In addition, the study conducts CSR evaluation and scoring based on collecting annual reports and sustainable development reports of enterprises. The reports are not presented uniformly, leading to difficulties in scoring and comparing. This inevitably leads to errors in the author's subjective unintended evaluation process.

For this study, the FDR-dependent variable was measured by the Z_score index (Altman, 1968), regression results showed that CSR had a positive effect on FDR, which opened the door for future studies to test the results with other FDR measures such as O_score (Ohlson, 1980), Zm_score (Zmijewski, 1984). In addition, future studies can overcome endogenous problems in the research model through the use of instrumental variables, and GMM models, overcoming other defects of the study model, and adding delay variables in the study model. In addition, to be able to find out the overall impact of CSR on the risk of corporate financial distress, studies can expand the study data to the entire business industry group, especially on financial industry groups such as banking, and extend the study period.

p-ISSN:1411-6510
e-ISSN :2541-6111

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p-ISSN:1411-6510
e-ISSN :2541-6111

Appendix

Appendix 1. CSR scoring criteria

No.	Environmental Responsibility Criteria (CSR_EN)
1	Does the company mention the issue of using raw materials in the production and business process?
2	Does the company mention energy consumption?
3	Does the company mention the issue of using and saving water in the production and business process?
4	Does the company address emissions to the surrounding environment where you operate?
5	Does the company address the issue of treating your wastewater and waste into the environment?
6	Does the company mention the development of policies on environmental protection?
7	Does the company express its concern about ambient issues?
8	Does the company mention developing plans for your environmental investment policy?
	Labor Responsibility Criteria (CSR_LA)
1	Does the company mention the issue of ensuring occupational safety and health for employees?
2	Does the company address the issue of education and training for employees?
3	Does the company mention the dissemination of internal information, legal policies related to rights and obligations for employees?
4	Does the company mention wage policies for employees?
5	Does the company mention benefits (social insurance, health insurance, entertainment, entertainment, sports, culture and arts, other emulation movements, support, etc.) for employees and their family members?
6	Does the company mention the issue of rewarding and rewarding employees for excellent work?
	Community Responsibility Criteria (CSR_CM)
1	Does the company report local community involvement and activities?
2	Does the company mention participating in activities to support the disabled, the elderly, the lonely and the poor?
3	Does the company mention participating in activities that contribute/sponsor charitable, humanitarian and charitable programs?
4	Does the company mention sponsorship and support for educational and intellectual incubation activities?
5	Does the company mention sponsoring and advocating for healthcare services?
	Product Responsibility Criteria (CSR_PR)
1	Does the company mention the safety and health of your customers?
2	Does the company mention providing full information and full labeling of products and services to customers?
3	Does the company mention product quality?
4	Does the company mention customer satisfaction after using your products or services?

(Source: Author Compilation)