

2023

Does ESG performance impact financial distress risk? evidence from Asia-Pacific markets

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Does ESG Performance Impact Financial Distress Risk?
Evidence from Asia-Pacific Markets



Mr. Methee Srikrjanapert

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

An Independent Study Submitted in Partial Fulfillment of the
Requirements
for the Degree of Master of Science in Finance
Department of Banking and Finance
Faculty Of Commerce And Accountancy
Chulalongkorn University
Academic Year 2023

ประสิทธิภาพของปัจจัย สิ่งแวดล้อม สังคม และ ธรรมชาติ (ESG) ส่งผลกระทบต่อความ
เสี่ยงทางการเงินหรือไม่? หลักฐานจากตลาดเอเชียแปซิฟิก



สารนิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
สาขาวิชาการเงิน ภาควิชาการธนาคารและการเงิน
คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2566

Independent Study Title Does ESG Performance Impact Financial Distress Risk?
Evidence from Asia-Pacific Markets
By Mr. Methee Srikrjanapert
Field of Study Finance
Thesis Advisor Associate Professor Boonlert Jitmaneroj, Ph.D.

Accepted by the FACULTY OF COMMERCE AND ACCOUNTANCY,
Chulalongkorn University in Partial Fulfillment of the Requirement for the Master of
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ความเสี่ยงทางการเงินหรือไม่? หลักฐานจากตลาดเอเชียแปซิฟิก. (Does ESG Performance
Impact Financial Distress Risk? Evidence from Asia-Pacific Markets) อ.ที่
ปรึกษาหลัก : บุญเลิศ จิตรมณีโรจน์



สาขาวิชา การเงิน
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6584042226 : MAJOR FINANCE

KEYWORD ESG, Financial Distress

D:

Methee Srikrjanapert : Does ESG Performance Impact Financial Distress Risk? Evidence from Asia-Pacific Markets. Advisor: Assoc. Prof. Boonlert Jitmaneroj, Ph.D.

This research investigates the relationship between Environmental, Social, and Governance (ESG) performance, represented by ESG scores, and Probability of Financial Distress Risk (FDR), as proxied by Ohlson O-Score, for firms operating in the Asia-Pacific region from 2010 to 2022. In addition, the aforementioned relationship during economic crisis and the level of market development is also investigated. The findings reveal a negative association between ESG performance and the probability of FDR in which the increase in ESG performance reduces the likelihood of FDR. Notably, the environmental and social pillars of ESG consistently exhibit negative relationship with FDR, with the social pillar having more pronounced effect. However, the governance pillar presents mixed results, underscoring the potential risks of excessive investment in governance-related activities. Moreover, this study underscores the impact of external factors, such as economic conditions and market development levels, on the ESG-FDR relationship. During economic crises, the Covid-19 pandemic, firms prioritizing ESG practices faced an elevated likelihood of financial distress. In terms of level of market development between developed and emerging markets, the research highlights that ESG practices exert a more significant influence in developed markets in the reduction in the probability of FDR, emphasizing the role of market maturity in shaping this connection.



Field of Study: Finance

Student's Signature

Academic Year: 2023

Advisor's Signature

Year:

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ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to my advisor, Assoc. Prof. Boonlert Jitmaneroj, Ph.D, for his support and invaluable guidance throughout the journey of this special project. His expertise, patience, and insightful feedback have been pivotal in shaping both my research and my growth as a student at Chulalongkorn University.

I am also immensely thankful to my committee members, Asst. Prof. Tanakorn Likitapiwat, Ph.D. and Asst. Prof. Roongkiat Ratanabanchuen, Ph.D., for their constructive critiques and comments during my proposal and special project defense. Their perspectives and expertise have greatly contributed to the depth and quality of my special project.

I would like to extend my appreciation to my friends at MSF program for their camaraderie and thoughtful discussions, which have enriched my academic experience. Lastly, I owe a debt of gratitude to my family for their understanding and support, which has been a source of strength throughout my time in MSF program.

Methee Srikrjanapert

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INTRODUCTION

Financial distress risk (FDR) faced by firms and the integration of environmental, social, and governance (ESG) considerations into corporate practices are prominent areas of interest in the field of business and finance. Financial distress refers to the challenging situation when a firm struggles to meet its financial obligations and maintain solvency (Altman & Hotchkiss, 2010). It encompasses factors such as insufficient cash flows, excessive debt burdens, declining profitability, or liquidity constraints. Firms encountering FDR are more vulnerable to negative outcomes like bankruptcy, insolvency, and their associated repercussions for employees, investors, creditors, and the wider economy (Altman and Hotchkiss, 2006).

ESG considerations have gained significant recognition in recent years, with increasing awareness among investors and stakeholders that a firm's environmental and social performance, as well as its governance practices, can have a profound impact on its overall financial performance and value (Herremans et al., 1993; Kim et al., 2014). By incorporating ESG factors into their decision-making processes, firms can enhance risk management, foster stronger stakeholder relationships, and align their operations with evolving societal expectations (Mishra & Modi, 2012). Consequently, integrating robust ESG practices has become a priority for companies aiming to secure their market position, attract responsible investors, and mitigate potential financial risks (Mishra & Modi, 2012).

Understanding the relationship between FDR and ESG performance is crucial for various stakeholders, as it can provide insights into the factors influencing a firm's financial stability, long-term value creation, and sustainability. Investors seek to evaluate the potential risks and rewards associated with their investment portfolios, considering both financial performance and non-financial indicators such as ESG factors (Kim et al., 2014). Moreover, policymakers aim to foster sustainable and resilient economies, requiring a comprehensive understanding of the factors that contribute to financial stability and long-term value creation. Additionally, managers and executives need insights into the potential benefits of integrating ESG practices into their business strategies to enhance their firm's resilience, reputation, and overall performance (El Ghoual et al., 2011; Sharfman & Fernando, 2008).

Previous literature has provided evidence of the role of ESG integration in reducing various types of risk and improving credit ratings (Harjoto & Laksmana, 2018; Husted, 2005; Jiraporn et al., 2014). Sun and Cui (2014) demonstrated that increased emphasis on ESG improves a firm's creditworthiness, while Cheng et al. (2014) provided evidence that ESG engagement facilitates easier access to finance. Goss and Roberts (2011) discovered that companies with ESG concerns may face slightly higher interest rates compared to socially responsible firms. Attig et al. (2013) showed that socially responsible companies tend to have higher credit ratings, suggesting that credit rating agencies consider ESG information when evaluating a firm's creditworthiness. Additionally, Boubaker et al. (2020) and Al-Hadi et al. (2017) have investigated the impact of ESG performance on firm bankruptcy risk and found a negative relationship for publicly listed firm in the US and Australia respectively.

Although much literature provides evidence and insights on the interplay between of impact of ESG integration and firm risks, the research in this area is far from complete especially for the Asia-Pacific region. This special project aims to be differed and contributes to the existing literature as follow.

Firstly, this research will investigate the linkage and the relationship of ESG performance proxied by ESG score and FDR proxied by Ohlson O-Score (Ohlson, 1980) for firms in Asia-Pacific region from the period of 2010-2022. Additionally, the total ESG score will be disaggregated into individual ESG pillars to assess their respective contributions and impacts on FDR enabling the identification of ESG aspects that contribute the most to mitigating FDR and provide valuable insights into the relationship between ESG performance and financial risk.

Secondly, while prior literature has examined the relationship between ESG performance and firm risks during crises, such as Branca et al. (2012), Bouslah et al. (2018), Lins et al. (2017), and Ullmann (1985), there is a need to fill the gap in the literature by exploring the association and impact of ESG performance and FDR during the most recent crisis, the Covid-19 pandemic. This research will examine how maintaining a commitment to ESG practices during the crisis may contribute to reducing FDR.

Thirdly, this research recognizes that different market developments and geographical regions create varying institutional environments that influence organizations' response to ESG practices, as highlighted in prior literature such as Jitmaneroj (2018) and Singhania and Saini (2021). In this regard, the project will contribute to the existing literature by analyzing whether there are different impacts of ESG performance on FDR between developed and emerging markets in the Asia-Pacific region. The diverse economic landscape and unique business dynamics of the region offer an intriguing context to investigate the relationship between FDR and ESG performance.

The findings of this study will have practical implications for investors, policymakers, and managers. They can guide investment decisions, shape regulatory frameworks, and inform corporate strategies to enhance financial stability and ESG performance. By understanding the interplay between FDR and ESG, stakeholders can make informed choices that promote sustainable and resilient economies while considering the long-term value creation and risk management of firms.

LITERATURE REVIEW

Financial Distress

Altman and Hotchkiss (2010) emphasize that the term "corporate financial distress" encompasses a range of interpretations and can be classified into several broad categories commonly utilized in corporate finance: bankruptcy, insolvency, failure, and default. The concept of failure arises when the actual risk adjusted return on capital consistently falls below the required rates of return on comparable investments. Essentially it is when a firm's revenues are inadequate to cover its costs or when the average return on investment consistently lags behind the firm's cost of capital (Wruck, 1990).

As noted by Campello et al. (2010), financially distressed firm experience increased cost of capital which implies that it becomes more expensive for these firms to raise funds, which further restricts their ability to finance their operations and investment projects. Moreover, the deterioration in credit ratings resulting from being in distress weakens their creditworthiness, making it harder to obtain favorable borrowing terms

(Sharfman & Fernando, 2008). In response to these difficulties, managers may become more inclined to take on greater risks

Financial distress creates a critical situation in which shareholders and their agents, such as firm management, face heightened incentives for risk-shifting. This phenomenon, as highlighted by Maksimovic and Titman (1991), refers to the transfer of risk from shareholders to other stakeholders or the broader financial system. When a company is in distress, shareholders and management may be motivated to take on riskier strategies or engage in activities that prioritize short-term gains over long-term stability.

As the potential costs of financial distress increase, firms are more likely to consider and pursue strategies aimed at mitigating or reducing negative consequences associated with financial distress (Altman, 1984; Gilson, 1989). As corporate sustainability has gained prominence as a global trend, firms may find engaging in activities related to corporate sustainability as a viable strategy to minimize consequences arise from being in distress.

Environmental Social and Governance (ESG)

The channels through which ESG factors influence corporate sustainability have garnered significant attention amongst the stakeholders. In recent times, companies and investors have become increasingly mindful of the critical role played by ESG factors and their impact on various aspects of business performance (Budsaratragoon & Jitmaneeroj, 2021). These factors extend beyond financial metrics and serve as indicators of non-financial performance, enabling the identification of issues related to business ethics, corporate social responsibility, and corporate governance (Kim & Li, 2021) . ESG factors encompass environmental aspects, such as a company's impact on the environment and efforts towards sustainability, as well as social factors, including relationships with employees, customers, and local communities. Additionally, governance factors assess a company's leadership, risk management practices, and adherence to ethical and legal standards (Kim & Li, 2021; Ramadhani, 2019).

In recent times, there has been a noticeable increase in the number of companies exhibiting a stronger dedication to ESG activities, aiming to establish themselves as socially responsible entities (Kim & Li, 2021). Simultaneously, a growing number of investors have begun incorporating assessments of ESG factors into their investment decision-making processes (Kim & Li, 2021). This trend has been widely acknowledged and supported in both academic and professional circles, with substantial evidence indicating that stakeholders are increasingly recognizing the relationship between ESG factors and corporate finance (Kim & Li, 2021; Ramadhani, 2019).

Financial Distress and ESG Performance

The relationship between ESG performance and financial distress can be supported by various existing theories and models namely the stakeholder theory, the theoretical models developed to examine the relationship between social performance and expected return, and the managerial opportunism theory.

Stakeholder Theory

The stakeholder theory offers valuable insights into the relationship between ESG performance and financial distress (Dmytriiev et al., 2021). According to this theory, when firms incorporate ESG strategies into their business model, they can generate moral capital or goodwill among their stakeholders. The idea behind this perspective is that by actively engaging in these practices, firms can build stronger relationships with their stakeholders, including customers, employees, suppliers, and the wider community (El Ghouli & Karoui, 2017; Godfrey, 2005; Godfrey et al., 2009). As a result, moral capital acts as an intangible asset that provides insurance-like protection mechanisms, thereby reducing the firm's risk exposure and mitigating operational, environmental, and social risks (El Ghouli & Karoui, 2017; Godfrey, 2005; Godfrey et al., 2009).

Bouslah et al. (2018) discuss the risk mitigation view, which aligns with the stakeholder theory. From this viewpoint, enhanced investments in ESG serve as a risk management strategy for firms. Essentially, by incorporating ESG strategy into the firm's business model, they act as safeguards against potential risks and uncertainties

that can significantly impact a firm's financial performance and stakeholders may perceive firms with strong ESG performance as more trustworthy, responsible, and sustainable, which can further contribute to their long-term financial stability (Albuquerque et al., 2019; Attig et al., 2013; Goss & Roberts, 2011; Jo & Na, 2012). By actively managing and addressing these risks, firms can enhance their overall resilience and reduce the likelihood of falling into financial distress (Albuquerque et al., 2019; Attig et al., 2013; Goss & Roberts, 2011; Jo & Na, 2012).

Theoretical models of the relationship between social performance and expected return

Theoretical models have been developed to examine the relationship between social performance and expected return, particularly in the context of investment decision-making. These models propose that investors consider both financial and non-financial criteria when making investment choices and suggest that sustainable firms as indicated by ESG performance tend to attract more investors, consequently lowering their risks (Heinkel et al., 2001; Kim et al., 2014; Lee & Faff, 2009; Mackey et al., 2007).

These models indicated that firms with strong ESG performance can gain a competitive advantage in attracting investors who prioritize both financial and non-financial factors, in particular the ESG factor. These investors perceive these firms as being better managed, ethically oriented, and more likely to generate long-term value (Lee & Faff, 2009; Mishra & Modi, 2012). As a result, the increased demand for these firms pushes their prices higher, leading to lower expected returns as a result from having lower risks (Lee & Faff, 2009; Mishra & Modi, 2012). On the other hand, firms associated with lower ESG performance may face weaker demand and investors may overlook or avoid these firms due to concerns regarding their ESG practices. As a consequence, the limited demand for these stocks can result in lower prices and higher expected returns as investors demand a higher return to compensate for the perceived higher risk associated with the firm. The advantage of having strong ESG performance can result in reduced risks, including the risk of financial distress (Lee & Faff, 2009; Mishra & Modi, 2012).

Managerial Opportunism Theory

The managerial opportunism theory provides an alternative perspective on the relationship between ESG expenditures and firm value. According to this theory, engaging in ESG activities can be seen as a form of managerial opportunism, where managers use these expenditures as a means to pursue their own self-interests rather than creating value for shareholders (Gilson, 1989). This theory suggested that ESG expenditures represent a waste of resources, ultimately leading to a decrease in the market capitalization of the company (Barnea & Rubin, 2010).

The proponents of the managerial opportunism theory argue that managers may engage in excessive CSR expenditures to bolster their reputation or personal image, even if these activities do not directly contribute to firm profitability (Barnea & Rubin, 2010). Another instance of managerial opportunism is when managers engage in ESG activities to garner support from social and environmental activists (Cespa & Cestone, 2007). By aligning themselves with these groups, managers may seek to reduce the likelihood of being replaced in the future, recognizing that their positions could be at risk if they do not demonstrate a commitment to social and environmental causes (Cespa & Cestone, 2007). This strategic maneuver allows managers to secure the support of influential stakeholders and mitigate potential challenges to their leadership. By diverting resources away from more productive uses, managers may be engaging in value-destroying behavior.

HYPOTHESIS DEVELOPMENT

Drawing from the stakeholder theory and theoretical models investigating the link between ESG performance and expected return, two implications on the association of ESG and FDR arise. Firstly, the adoption of ESG strategies into firm's business model has the potential to mitigate firm risk, resulting in a decrease in FDR (Albuquerque et al., 2019; Husted, 2005; Jo & Na, 2012; Lee & Faff, 2009; Mishra & Modi, 2012). Secondly, it can improve firms' financing conditions, thereby lowering their susceptibility to financial distress (Attig et al., 2013; El Ghouli et al., 2011; Goss & Roberts, 2011; Jiraporn et al., 2014; Sharfman & Fernando, 2008). Based on these implications, the study proposes the following hypothesis.

H1: ESG performance measured by an ESG score is negatively associated with FDR

Crisis events, such as economic downturns, natural disasters, or social upheavals, can have profound effects on the financial landscape and the risk profiles of the firms.

The level of engagement in ESG activities is likely to decrease under unfavorable economic conditions or when firms face financial constraints. According to Ullman (1985), economic considerations take precedence over social demands during periods of low profitability. Firms might allocate fewer resources to ESG initiatives during challenging economic conditions, as their primary focus shifts towards preserving financial stability and overcoming immediate economic hardships. Branca et al. (2012) provide theoretical and empirical evidence demonstrating that firms reduce their investments in ESG activities during unfavorable business cycles. Hence, when firms reduce their focus on ESG activities during a crisis, they may be compromising their ability to effectively manage risks and maintain stakeholder trust. This can result in increased FDR, as the firm may be less prepared to handle the challenges and uncertainties associated with the crisis.

On the contrary, prior literature also provide evidence that firms use ESG practices as a means to enhance their long-term resilience and reputation, even during challenging times. Firms with strong environmental and social performance can maintain stronger relationships with stakeholders during crises (Lins et al., 2017). This social capital helps to build trust and loyalty, leading to better risk management and a more positive reputation for the company (Lins et al., 2017). Stakeholders often perceive socially responsible firms, characterized by higher ESG performance, as less risky and safer compared to firms with lower performance. This perception stems from the belief that higher ESG performance is indicative of better management quality (McGuire et al., 1988; Waddock & Graves, 1997). Consequently, these firms with high level of ESG engagement during crisis may experience lower volatility in their stock prices and reduced exposure to risks (Broadstock et al., 2021; Lins et al., 2017).

Moreover, strong engagement in governance practices, such as transparent disclosure, board independence, and effective risk management systems, contribute to better risk

oversight and decision-making during crises. Firms with robust governance structures are more likely to anticipate and respond promptly to emerging risks, ensuring that appropriate measures are in place to mitigate the impact of crises on their operations and financial performance (Eccles et al., 2012; Zagorchev & Gao, 2015).

Therefore, maintaining a commitment to ESG practices, even during a crisis, can contribute to reducing FDR by enhancing risk management capabilities, stakeholder relationships, and investor confidence. Hence, the following hypothesis is proposed.

H2: The impact of ESG performance on FDR depends on economic condition, in particular, crisis and non-crisis

When it comes to ESG performance, different market developments and geographical regions can create varying institutional environments, which in turn influence how organizations respond to ESG practices (Budsaratragoon & Jitmaneeroj, 2021). The framework used to explain this effect is the Institutional theory (Jennings & Zandbergen, 1995).

In developed markets with well-established regulatory frameworks and greater stakeholder awareness, organizations may face higher expectations and pressures to integrate ESG practices into their operations. These organizations may proactively adopt ESG initiatives to align with prevailing norms and maintain legitimacy in the eyes of stakeholders (Singhania & Saini, 2021).

On the other hand, in emerging markets with evolving regulatory landscapes and lower stakeholder awareness, organizations may face different institutional pressures. They may prioritize more immediate financial concerns or encounter challenges in implementing comprehensive ESG practices (Singhania & Saini, 2021). However, emerging markets, which previously had lower levels of engagement in corporate sustainability, have recently made significant strides in improving their ESG practices. These efforts are aimed at establishing a solid foundation for sustainable economic development (Jitmaneeroj, 2023).

For instance, Indonesia and Vietnam has history of high corruption levels and limited governance visibility have recognized the need to address these challenges and have

taken steps to integrate ESG factors into their business operations and reporting (Singhania & Saini, 2021). As an initial step, these countries have prioritized the adoption of global frameworks like the Global Reporting Initiative (GRI) and Sustainability Accounting Standards Board (SASB) (Singhania & Saini, 2021). In addition, enhancing corporate governance measures has the potential to expand and deepen the scope of voluntary disclosure in these economies (Lagasio & Cucari, 2019).

While the impact of ESG performance on FDR may vary between developed and emerging markets, both markets are increasingly recognizing the importance of ESG considerations in managing risks and creating sustainable value. The level of impact can be influenced by the maturity of ESG policies and practices, as well as the unique characteristics of each market. As a result, the following hypothesis is developed.

H3: The impact of ESG performance on FDR depends on the level of market development, i.e., developed and emerging markets.

RESEARCH DESIGN AND METHODOLOGY

Sample and Data

This research focuses on firms in the Asia-Pacific region, encompassing countries such as Australia, China, Hong Kong, India, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand, and Vietnam. The data spans from 2010 to 2020. Among these firms, a total of 10,722 firms-year observation is classified as part of the Asia-Pacific developed market, including Australia, Hong Kong, Japan, Taiwan, Singapore, and South Korea. The remaining 5,668 firms-year observation are categorized as part of the Asia-Pacific emerging market.

Potential survivorship bias could arise if the dataset only included observable firms with complete ESG score reporting throughout the entire 2010-2022 period. For instance, in Thailand in 2010, merely 8 firms reported ESG scores. The bias would be evident if exclusively opted for the data of these 8 firms, resulting in a 103 (8*13) firm-year observations over the 13-year span. However, this is not the case, as this research intentionally included all available firms that reported their ESG scores. This

choice is supported by the firm-year distribution data presented in Table 1, where it's evident that the number of firms reporting ESG scores has been steadily increasing over time. This approach mitigates survivorship bias and results in an unbalanced panel dataset.

Table 1 below summarized the distribution of firms across countries in both the developed and emerging markets.

Table 1: Firm-Year Distribution of Sample across Asia-Pacific Market

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Australia	93	109	112	133	147	151	162	171	185	215	232	241	224
China	35	33	36	40	45	50	49	168	200	410	550	622	656
Hong Kong	77	102	110	112	120	120	127	157	176	199	206	222	203
India	39	56	56	56	65	68	60	61	67	90	96	119	221
Indonesia	10	14	17	21	21	23	27	27	31	32	32	38	43
Japan	269	245	269	280	291	298	306	315	320	345	360	386	399
South Korea	18	59	68	70	74	84	90	91	97	100	64	105	118
Malaysia	16	23	26	27	29	29	32	37	38	40	48	132	151
Philippines	7	10	14	13	16	18	17	20	21	20	17	21	26
Singapore	27	28	27	28	30	30	32	29	33	50	64	61	63
Taiwan	22	60	73	77	75	78	78	81	79	90	78	88	114
Thailand	8	11	14	17	20	22	24	30	33	53	83	109	112
Total	621	750	822	874	933	971	1004	1187	1280	1644	1830	2144	2330

Table 2 provides distribution of firms across the industry classification based on the Global Industry Classification Standard (GICS).

Table 2: Firm-Year Distribution of Sample across Industry

Sector	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Consumer Discretionary	96	99	122	124	136	143	149	164	177	215	240	281	311
Industrials	144	181	185	193	206	214	227	260	275	320	323	393	447
Health Care	25	30	35	40	46	56	58	83	94	132	160	181	198
Real Estate	51	61	67	73	84	89	89	110	116	148	167	189	187
Materials	96	116	120	123	132	132	126	143	157	204	236	281	332
Energy	27	36	37	40	40	40	42	50	52	58	63	71	81
Financials	17	19	22	25	26	29	23	25	28	39	45	48	43
Utilities	38	40	43	46	49	49	51	59	65	74	80	88	88
Consumer Staples	46	53	68	72	75	79	88	103	111	157	182	210	210
Information Technology	46	71	75	85	87	83	90	119	128	197	227	282	306
Communication Services	35	44	48	53	52	57	61	71	77	100	107	120	127
Total	621	750	822	874	933	971	1004	1187	1280	1644	1830	2144	2330

The ESG performance of the firms in the environmental (E), social (S), and governance (G) dimensions is evaluated using the ESG score obtained from the widely recognized and extensively used Refinitiv ESG database. The Refinitiv ESG database is commonly referenced in the literature (Jitmaneeroj, 2023; Krüger, 2015; Liang & Renneboog, 2017; Lins et al., 2017; Stellner et al., 2015) on corporate sustainability. All relevant financial information required for the analysis is retrieved from the Refinitiv DataStream.

Independent Variable – ESG

To measure the firm ESG performance, this research uses the ESG score from Refinitiv ESG database. Refinitiv is widely recognized for its robust and expansive ESG database, which stands out as one of the most comprehensive resources in the industry (Eikon, 2022). This database encompasses over 85% of the global market capitalization, encompassing a diverse set of more than 630 distinct ESG metric with historical data available within the Refinitiv ESG database extends as far back as 2002, enabling valuable insights into the long-term ESG performance of companies across various industries and regions (Eikon, 2022).

Refinitiv's ESG scores are a reliable and transparent reflection of companies' ESG performance and capacity. These scores are derived from a robust data framework that considers various ESG metrics, industry materiality, and company size biases (Eikon, 2022). Moreover, Refinitiv also provides an overall ESG combine score (ESGC), which adjusts the ESG score for any news controversies that may significantly impact the assessed companies (Eikon, 2022).

For the ESG score, it is calculated from the weighted average of the three ESG pillars: the environmental (E), social (S), and governance (G) pillars (Eikon, 2022)

The environmental score assesses a company's performance across three key sub-pillars: emissions, innovation, and resource use. This comprehensive evaluation allows for an accurate measurement of a firm's environmental impact throughout its entire supply chain and its focus on future-oriented practices.

The social score measures a company's performance in fostering an inclusive and responsible environment for all stakeholders. It evaluates the company's commitment to community guidelines, human rights promotion, product responsibility, and workforce development, thereby ensuring the well-being and satisfaction of its stakeholders.

The governance pillar evaluates the design and implementation of sustainability strategies, guidelines, and processes within a company. It assesses the effectiveness of the company's governance structure in promoting sustainable practices and ensuring accountability. This pillar examines the company's commitment to ethical business conduct, transparent decision-making, and responsible leadership, emphasizing the importance of sound governance principles in driving sustainable outcomes.

In term of the overall ESGC score computation, in cases where companies are associated with ESG controversies, the ESGC score is determined by the weighted average of both the ESG scores and ESG controversies score for each fiscal year. The score takes into account recent controversies, which are reflected in the most recent period. However, if companies are not involved in any ESG controversies, the ESGC score is the same as ESG score (Refinitiv). This approach ensures that the ESGC score appropriately captures the impact of controversies on overall ESG performance while maintaining transparency and fairness in the assessment.

Dependent Variable – Financial Distress

In previous literature, the measurement of FDR is commonly categorized into two main approaches: the accounting-based approach and the market-based approach (Altman et al., 2017; Tykvová & Borell, 2012). Within the accounting-based approach, widely used models for FDR include the Z-score (Altman, 1968), the O-score (Ohlson, 1980), and the ZM-score (Zmijewski, 1984). On the other hand, the market-based approach considers metrics such as the option-to-default model (Black & Scholes, 1973), the distance-to-default based on the KVM model (Merton, 1974), and a simple hazard model (Shumway, 2001). These different models provide alternative ways to assess and measure the likelihood of FDR in firms, allowing for a comprehensive understanding of FDR from both accounting and market perspectives.

Numerous previous studies have examined the predictive accuracy of the two approaches for FDR. Agarwal and Taffler (2008) conducted a comprehensive analysis using an international dataset and found that the accounting-based model, specifically the Altman Z-score, outperformed the market-based model in predicting bankruptcy. Furthermore, Altman et al. (2017) conducted a recent study reaffirming the efficacy of the accounting-based model in accurately assessing bankruptcy risks.

Different studies have compared the performance of various accounting-based models in predicting FDR. Dichev (1998) found that the O-score was more effective than Altman's Z-score in predicting CRSP delisting. Wu et al. (2010) demonstrated that Altman's model performed poorly compared to other accounting-based models such as Ohlson's and Zmijewski's model. In their study, Wu et al. (2010) concluded that the O-score provided the most accurate out-of-sample forecast of FDR. Furthermore, (Oz & Simga-Mugan, 2018) showed that the O-score exhibited superior prediction ability and demonstrated stationarity over time, making it applicable across distinct time periods, including both pre- and post-crisis periods. These findings highlight the superior performance and robustness of the O-score in predicting FDR.

Given the strong predictive performance of the Ohlson model in previous studies, this research adopts the O-score as a reliable proxy for measuring the probability of FDR. Based on the Ohlson (1980), the probability of FDR is shown in the equation below.

$$\text{Prob(FDR)} = [1 + \exp(-O)]^{-1} \quad (1)$$

From equation (1), it can be concluded that a high O-score is associated with higher probability of financial distress.

The O-score (**O**) used in **equation 1** above is calculated using the following equation,

$$O = -1.32 - 0.407 \log(\text{TA}) + 6.03 \frac{\text{TL}}{\text{TA}} - 1.43 \frac{\text{WC}}{\text{TA}} + 0.076 \frac{\text{CL}}{\text{CA}} - 1.72D_{\text{TL}} - 2.37 \frac{\text{NI}}{\text{TA}} - 1.83 \frac{\text{FFO}}{\text{TL}} + 0.285D_{\text{NL}} - 0.521 \frac{\text{NI}(t) - \text{NI}(t-1)}{|\text{NI}(t) + \text{NI}(t-1)|} \quad (2)$$

Where:

TA is the total asset,

TL is total liability,

WC is working capital,

CL is current liability,

CA is current asset,

D_{TL} is 1 when TL is greater than TA and 0 otherwise,

NI is net income,

FFO is fund from operation,

D_{NL} is 1 when net loss of the firm occurs for two consecutive year (t) and 0 otherwise.

Control Variables

Based on previous studies by (Boubaker et al., 2020) and (Al-Hadi et al., 2017), this research incorporates several control variables to account for additional factors that could potentially influence the financial distress risk (FDR) and ESG performance. The control variables included in the model are market-to-book (MTB), cash, firm size, leverage, R&D level, return on asset (ROA), and quick ratio.

Hsu et al. (2015) argue that firms with higher growth opportunities proxied by MTB tend to be more appealing to investors, suggesting that these firms may have easier access to external financing and lower financial constraints. Consequently, it is reasonable to anticipate a negative relationship between MTB and FDR.

The ratio of cash and cash equivalents to total assets, often referred to as cash or slack, is an important financial metric. According to the pecking order theory, firms with higher financial slack are believed to rely less on external financing and maintain lower levels of debt (Verwijmeren & Derwall, 2010). In line with this theory, we anticipate a negative relationship between the slack ratio and FDR.

Firm size measures as log-scaled of total asset accounts for variations in resources and competitive financing capabilities (Al-Hadi et al., 2017). It is anticipated that larger firms would have an advantage in dealing with financial distress due to their superior economic and political influence compared to smaller firms (Al-Hadi et al., 2017). A negative relationship between firm size and FDR is expected. However, according to Hsu et al. (2015), larger firms often exhibit higher debt ratios, which in turn increases their probability of bankruptcy. Therefore, a positive relationship between the firm size and FDR is anticipated.

Leverage representing the firm's ability to take on debt. It is calculated as the ratio of short-term and long-term debt to total assets. The expectation is that higher levels of leverage may increase a firm's financial vulnerability and thus potentially contribute to financial distress.

The ROA is a measure of firm profitability by calculating the ratio of net income to total assets and the quick ratio include to capture the firm's liquidity position, specifically focusing on its ability to meet short-term financial obligations. Higher levels of ROA and a higher quick ratio are expected to contribute to a firm's financial stability and potentially decrease its vulnerability to financial distress.

In summary, the predicted signs of the control variables to be included in the model are shown in table 3 as follow,

Table 3: Control variables and their predicted signs

	MTB	Slack (Cash)	Firm Size	Leverage	Profitability (ROA)	Liquidity (Quick Ratio)
Sign(s)	(-)	(-)	(+,-)	(+)	(-)	(-)

Empirical Models

To investigate the relationships between FDR and ESG performance, this research employs a baseline multivariate regression model following (Boubaker et al., 2020) and (Al-Hadi et al., 2017). The model is specified as follows:

$$FD_{i,t} = \beta_0 + \beta_1 ESG + \beta_2 X_{i,t} + \text{industryFE} + \text{yearFE} + \varepsilon_{i,t} \quad (3)$$

Where:

FD is probability of financial distress calculated using **equation 1**

ESG is ESG performance

X is a vector of control variables

industryFE is industry fixed effect

yearFE is year fixed effect

ε is overall error term

For each firm i at a given year t , the dependent variable FD represents the probability of financial distress, which is calculated based on equation (1) as proposed by Ohlson (1980). The independent variable ESG is captured by the ESG score that incorporates various dimensions of environmental, social, and governance factors, in particular the overall ESG combine score.

Control variables are included in the model as the vector X , which captures other relevant factors that may influence both FDR and ESG performance.

To address a potential bias, in particular the omitted variable bias where meaningful variables are omitted creating endogeneity problem, the fixed effects are considered. It is useful when dealing with unobservable heterogeneity or time-invariant characteristics that might contribute to the potential bias.

The time fixed effect is included to control for time-invariant factors affecting all entities (firms) at the same time, while the industry fixed effect is used to control for unobservable industry-specific factors that do not change over time. Since industry fixed effect is already employed, the country fixed effect is not considered because the industries based on GICS sector remain the same and does not vary across countries.

The expect result of the model and the predicted sign of the parameter of interest, β_1 **coefficient on ESG**, is statically significant and negative. This indicated that the increase in ESG score is associated with the reduction of the probability of FDR supporting **hypothesis 1 (H1)**.

In addition, the based model will be extended to investigate and provide additional insights regarding the influence of each ESG dimension, E pillar, S pillar, and G pillar, on the association between ESG performance and FDR . This information is of importance as it can uncover the specific ESG pillar that offers the greatest advantage for firms aiming to decrease their level of FDR thereby mitigate the overall risk of being in financial distress.

To examine the relationship between ESG performance and FDR during the Covid-19 crisis and to assess the differential impact of ESG performance on FDR across

developed and emerging markets, this study employs the additional models with dummy variable (D) and the interaction term.

$$FD_{i,t} = \beta_0 + \beta_1 ESG + \beta_2 D_{covid} + \beta_3 ESG * D_{covid} + \beta_4 X_{i,t} + \text{industryFE} + \text{yearFE} + \varepsilon_{i,t} \quad (4)$$

The interaction effect of ESG and Covid provides insights into how the relationship between ESG performance and FDR may be influenced by the presence of the Covid-19 crisis. It will help to determine whether the impact of ESG performance on FDR differs during this period of heightened uncertainty and economic disruption. D_{covid}

The expect result of the parameter of interest, **β_3 coefficient on $ESG * D_{covid}$** , is statically significant and negative. This indicated that there is different impact of ESG performance on FDR and that the relationship between ESG performance and FDR is more pronounced during Covid 19 period supporting **hypothesis 2 (H2)**. Firm with higher ESG score during covid 19 are seen as a more resilient and able to withstand uncertainties leading to better overall performance and lowering FDR.

$$FD_{i,t} = \beta_0 + \beta_1 ESG + \beta_2 D_{developed} + \beta_3 ESG * D_{developed} + \beta_4 X_{i,t} + \text{industryFE} + \text{yearFE} + \varepsilon_{i,t} \quad (5)$$

The interaction effect of ESG and developed market allows for the exploration of the varying impact of ESG performance on FDR between firms in the emerging market and those in developed markets. This analysis will shed light on the dynamics and characteristics of developed markets and their potential influence on the relationship between ESG performance and FDR.

The expect result of the parameter of interest, **β_3 coefficient on $ESG * D_{developed}$** , is statically significant and negative. This indicated that there is different impact of ESG performance on FDR between developed and emerging market supporting **hypothesis 3 (H3)**. As ESG performance is driven by maturity of ESG policies and practices, the relationship between ESG performance and financial distress is more prominent for developed market.

EMPIRICAL RESULTS

Descriptive Statistic

Table 4: Overall Descriptive Statistic

Variables	Mean	Median	SD	Max	Min
<i>Dependent Variable</i>					
Probability of FDR	12.20%	6.81%	9.48%	47.53%	0.27%
<i>Independent Variables</i>					
ESG Combine Score	43.48	43.83	20.04	93.15	0.58
Environmental Pillar	40.68	41.36	27.63	98.64	0.00
Social Pillar	41.86	40.65	24.32	97.48	0.05
Governance Pillar	50.08	50.36	22.39	98.54	0.10
<i>Control Variables</i>					
Slack	0.1093	0.0849	0.0877	0.3242	0.0094
MTB	2.4779	1.5659	2.3173	9.2340	0.4775
ROA	0.0578	0.0466	0.0489	0.1743	-0.0180
Current Ratio	1.7330	1.4712	0.9641	4.2742	0.5319
Leverage	0.2342	0.2254	0.1520	0.5348	0.0073
Size	9.7093	9.7180	0.5791	10.7372	8.6120

Table 4 presents the descriptive statistics for the variables employed in this research within the Asia-Pacific region from 2010 to 2022. The dependent variable, the Probability of FDR, exhibits a mean value of approximately 12.20%, indicating an average likelihood of firms experiencing financial distress. However, the median value, lower at 6.81%, suggests a positively skewed distribution, with more firms having lower probabilities. The standard deviation of 13.31% shows considerable variability in probability of FDR across the sample. The highest observed probability of bankruptcy is 47.53%, while the lowest stands at 0.27%.

In term of the independent variables, which capture the Environmental, Social, and Governance (ESG) performance, the mean ESG Combine Score across all firms is 43.48 from the maximum score of 100, suggesting lower bound on the overall ESG performance. However, a certain degree of variation existed, with a standard deviation of 20.04. The Environmental Pillar exhibits a mean score of 40.68, implying a moderate level of environmental performance, accompanied by standard deviation of 27.63. The Social Pillar, with a mean score of 41.86, aligns with this trend with standard deviation of 24.32. In contrast, the Governance Pillar demonstrates the

highest mean score at 50.08, indicating stronger governance performance across the Asia-Pacific Market.

For the control variables, the mean of Slack is 0.1093, indicating that, on average, firms in the region maintain relatively low cash reserves compared to their total assets. The Market-to-Book (MTB) ratio, with a mean of 2.4779, shows growth opportunities and favorable market valuations for the sampled firms. The mean Return on Assets (ROA) stands at 0.0578, reflecting a moderate level of profitability, while the Current Ratio's mean of 1.7330 indicates a relatively strong ability to meet short-term obligations. Leverage, with a mean of 0.2342, points to a low debt balance relative to firm's total assets, and Size, represented as the logarithm of total assets, has a mean of 9.7093, underlining the diversity in firm sizes across the region.

Table 5: Descriptive Statistic of Dependent and Independent Variables segmented by Market

Country	Firms	Statistic	Prob. of FDR	ESG Combine Score	E Pillar	S Pillar	G Pillar
Australia	310	Mean	11.61%	41.21	29.15	43.15	53.15
	10.86%	Median	5.59%	39.07	23.77	39.67	53.82
		SD	14.03%	19.26	26.36	22.46	22.58
China	781	Mean	11.24%	34.62	31.16	28.09	46.73
	27.37%	Median	6.22%	32.59	27.87	24.09	45.65
		SD	12.47%	16.98	24.00	19.34	20.91
Hong Kong	283	Mean	13.70%	45.19	41.90	42.10	53.51
	9.92%	Median	8.29%	46.76	44.81	41.40	54.11
		SD	13.66%	17.60	26.06	22.00	19.88
India	259	Mean	13.58%	47.56	42.97	53.08	51.05
	9.07%	Median	7.79%	48.21	41.66	52.62	49.15
		SD	14.61%	17.69	24.98	22.57	22.24
Indonesia	50	Mean	12.11%	44.45	33.68	49.32	47.09
	1.75%	Median	5.63%	43.25	30.44	49.13	47.47
		SD	14.71%	19.06	24.07	22.23	22.20
Japan	459	Mean	11.56%	46.51	50.64	42.08	49.76
	16.08%	Median	6.30%	48.65	55.68	42.15	50.35
		SD	12.94%	20.63	28.38	24.28	23.08
South Korea	138	Mean	13.95%	45.30	46.05	45.11	49.58
	4.84%	Median	8.54%	50.26	54.27	49.23	51.16
		SD	14.48%	23.57	30.00	28.42	24.32
Malaysia	189	Mean	11.79%	45.26	35.95	48.19	50.78
	6.62%	Median	6.73%	45.42	34.13	49.88	50.46

		SD	12.78%	18.25	22.83	21.76	21.38
Philippines	29	Mean	14.81%	42.78	37.66	43.73	49.48
	1.02%	Median	13.64%	41.75	36.28	43.08	50.33
		SD	9.23%	20.70	25.30	23.57	23.33
Singapore	78	Mean	11.46%	43.36	40.96	43.52	47.43
	2.73%	Median	6.02%	44.39	43.76	45.34	48.51
		SD	12.54%	19.29	25.09	22.13	23.89
Taiwan	152	Mean	11.31%	46.62	45.62	45.74	48.43
	5.33%	Median	7.01%	49.50	48.44	48.28	49.26
		SD	11.88%	23.68	26.99	28.56	23.99
Thailand	126	Mean	15.09%	52.63	45.60	58.51	51.68
	4.41%	Median	11.16%	56.40	47.18	62.57	52.93
		SD	14.06%	18.97	26.51	21.79	21.74

Table 5 provides a detailed summary of descriptive statistics for both dependent and independent variables, segmented by country, across the Asia-Pacific region. From the table, it can be seen that China accounts for a substantial portion, approximately 27%, of the total observations, while the Philippines constitutes the smallest share, approximately 1%, of the entire dataset.

Starting with the Probability of FDR, we observe that the mean values differ across countries. For instance, Australia exhibits a lower average financial distress risk of 11.61%, while Thailand shows a relatively higher average of 15.09%. These disparities represented the heterogeneity in financial health among the countries under consideration. In term of the ESG Combine Score. Thailand records the highest average score at 52.63, reflecting strong overall ESG commitment. In contrast, China has a lower average score of 34.62, suggesting room for improvement in ESG practices.

Further dissecting ESG into its constituent pillars, the Environmental Pillar, Japan leads with an average score of 50.64, indicating robust sustainability practices. Conversely, Australia lags behind with a lower average score of 29.15 in this category reflecting the fact that Australia is known for its abundant natural resources, including coal, iron ore, gold, and natural gas. Hence, the mining and resources sector plays a significant role in the country's economy, with exports of these commodities contributing substantially to its GDP. In the Social Pillar, Thailand boasts the highest

average score at 58.51, reflecting its commitment to social responsibility. In contrast, the China has a lower average score of 28.09 in this dimension. Lastly, the Governance Pillar, Hong Kong demonstrates strong governance practices with an average score of 53.51, whereas China's mean score of 46.73 reflects a somewhat lower level of governance performance. The lower performance in social and governance pillar in China could reflect that fact that labor practices, including working conditions and wages, have faced scrutiny and criticism in the past as well as the government has a significant influence on firms and businesses. Therefore, some firms may prioritize aligning with government policies and objectives over international standards, which can impact their scores.

Table 6: Descriptive Statistic of Control Variables by segmented by Market

Country	Firms	Statistic	Slack	MTB	ROA	Current Ratio	Leverage	Size
Australia	310	Mean	0.0790	2.4897	0.0607	1.7557	0.2103	9.2091
	10.86%	Median	0.0512	1.6504	0.0523	1.4350	0.2070	9.1109
		SD	0.0800	2.2612	0.0494	1.0568	0.1330	0.5655
China	781	Mean	0.1530	3.6243	0.0656	1.7357	0.2214	9.7272
	27.37%	Median	0.1339	2.6253	0.0534	1.4242	0.2121	9.6652
		SD	0.0915	2.7237	0.0533	1.0154	0.1529	0.5587
Hong Kong	283	Mean	0.1172	2.0804	0.0528	1.6244	0.2416	9.9451
	9.92%	Median	0.1022	1.2551	0.0402	1.3866	0.2391	9.9816
		SD	0.0837	2.1334	0.0473	0.9250	0.1441	0.5052
India	259	Mean	0.0395	3.9972	0.0792	1.5436	0.2345	9.6212
	9.07%	Median	0.0243	3.0146	0.0693	1.3555	0.2276	9.5597
		SD	0.0425	2.9720	0.0575	0.8317	0.1761	0.5992
Indonesia	50	Mean	0.0811	3.0886	0.0776	2.0137	0.2415	9.4709
	1.75%	Median	0.0560	2.2522	0.0668	1.7158	0.2350	9.4267
		SD	0.0711	2.3575	0.0583	1.1895	0.1506	0.3948
Japan	459	Mean	0.1266	1.6318	0.0500	1.8656	0.2290	9.9447
	16.08%	Median	0.1042	1.2014	0.0430	1.6258	0.2053	9.9085
		SD	0.0875	1.3777	0.0406	0.9420	0.1621	0.4654
South Korea	138	Mean	0.0779	1.6417	0.0416	1.4818	0.2412	9.9299
	4.84%	Median	0.0665	0.9820	0.0316	1.2727	0.2426	9.9260
		SD	0.0542	1.7795	0.0455	0.7851	0.1369	0.4961
Malaysia	189	Mean	0.0708	2.4853	0.0594	1.9434	0.2446	9.3432
	6.62%	Median	0.0439	1.4656	0.0486	1.7099	0.2483	9.3820
		SD	0.0728	2.5225	0.0509	1.0503	0.1439	0.5385
Philippines	29	Mean	0.0736	2.7005	0.0549	1.6065	0.2498	9.7916

	1.02%	Median	0.0579	2.4317	0.0497	1.4011	0.3236	9.8278
		SD	0.0614	1.7613	0.0283	0.7863	0.1092	0.3435
Singapore	78	Mean	0.0613	1.8672	0.0491	1.5824	0.2539	9.7563
	2.73%	Median	0.0411	1.1198	0.0365	1.2874	0.2581	9.8001
		SD	0.0613	1.9643	0.0414	0.9953	0.1375	0.5281
Taiwan	152	Mean	0.1569	2.2193	0.0606	1.7235	0.2365	9.6002
	5.33%	Median	0.1447	1.5896	0.0484	1.5190	0.2239	9.5565
		SD	0.0883	1.7991	0.0510	0.7635	0.1419	0.4936
Thailand	126	Mean	0.0696	3.3189	0.0607	1.6562	0.2546	9.4479
	4.41%	Median	0.0535	2.2426	0.0547	1.4000	0.3441	9.4378
		SD	0.0603	2.6205	0.0484	0.9996	0.1499	0.5368

Table 6 presents a descriptive statistic of control variables within each country across the Asia-Pacific region. These variables include Slack, Market-to-Book ratio (MTB), Return on Assets (ROA), Current Ratio, Leverage, and Size.

For Financial slack, Australia and China exhibit higher mean Slack values compared to other countries, indicating that firms in these countries tend to maintain more significant financial slack, potentially reducing their reliance on external financing.

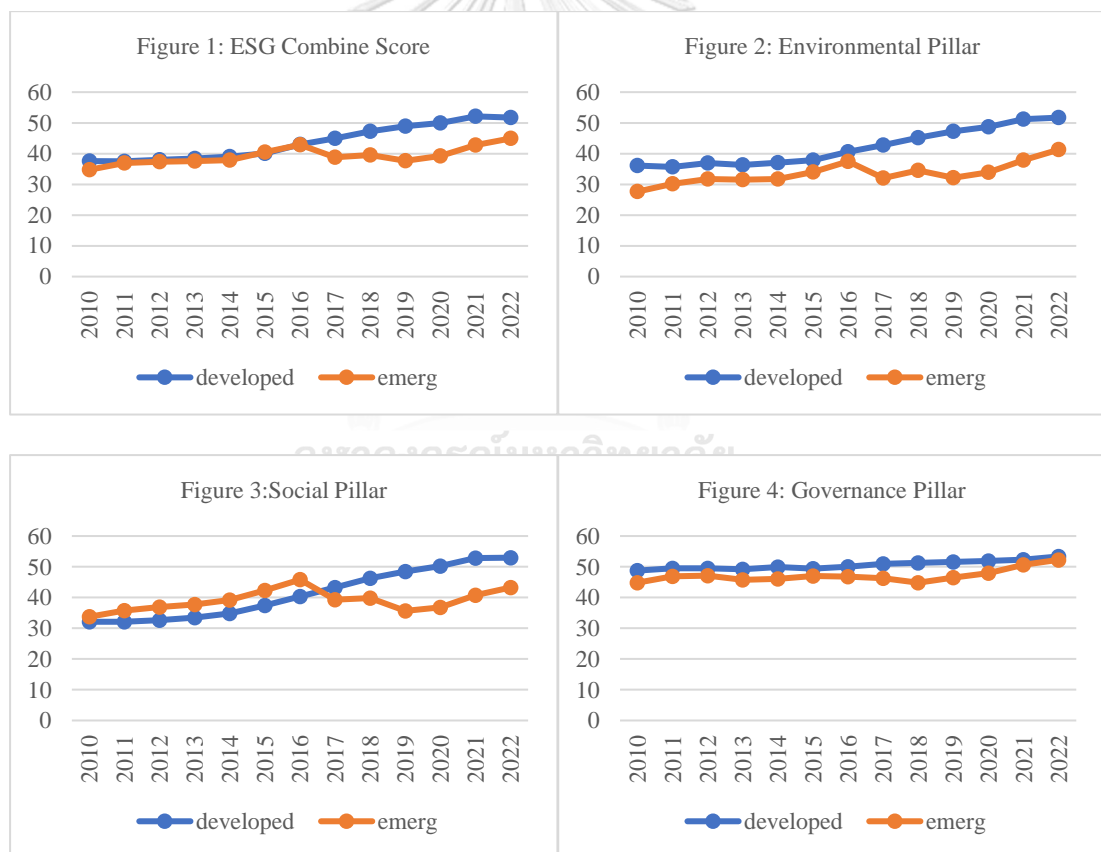
In term of the Market-to-Book ratio (MTB), China has the highest mean MTB, suggesting that its firms, on average, have higher growth opportunities and are more appealing to investors. In contrast, countries like Japan and Korea exhibit lower MTB values, indicating more mature and stable markets. For the ROA, India and China show higher mean ROA values, indicating stronger profitability, while Japan and Korea have lower ROA values.

For the Current Ratio, reflecting a firm's liquidity, reveals that Indonesia has the highest mean value, while Hong Kong and Singapore have lower mean values. In term of Leverage, which measures a firm's debt ratio, Philippines and Thailand have relatively higher mean leverage, suggesting that firms in these countries tend to have higher debt levels. In contrast, countries like Japan and Korea exhibit lower mean leverage values, indicating a more conservative approach to debt financing.

Lastly, examining Size, which is the logarithm of total assets, we see variations in firm size across countries. Australia and Malaysia have the smallest mean size, while

India and Japan have the largest mean size. These differences could be attributed to variations in market maturity and economic development.

When analyzing the ESG performance trend from 2010 to 2022 as shown in figure 1 to 4, a consistent pattern is observed. Developed markets exhibit a steady year-on-year increase in their ESG combine scores. Initially, emerging markets follow this upward trajectory until 2016, at which point they begin to drop lag behind their developed counterparts. However, the upward trend is reverted and gain momentum again in 2019. This similar trend extends to the environmental and social pillars for both developed and emerging markets. However, in the case of the governance pillar, the score shows relatively modest growth in both markets, remaining stable throughout the 2010-2022 period.

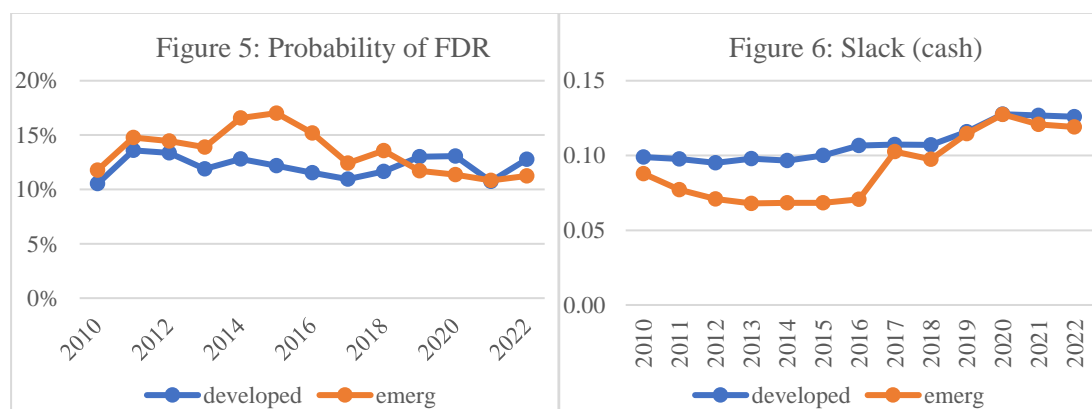


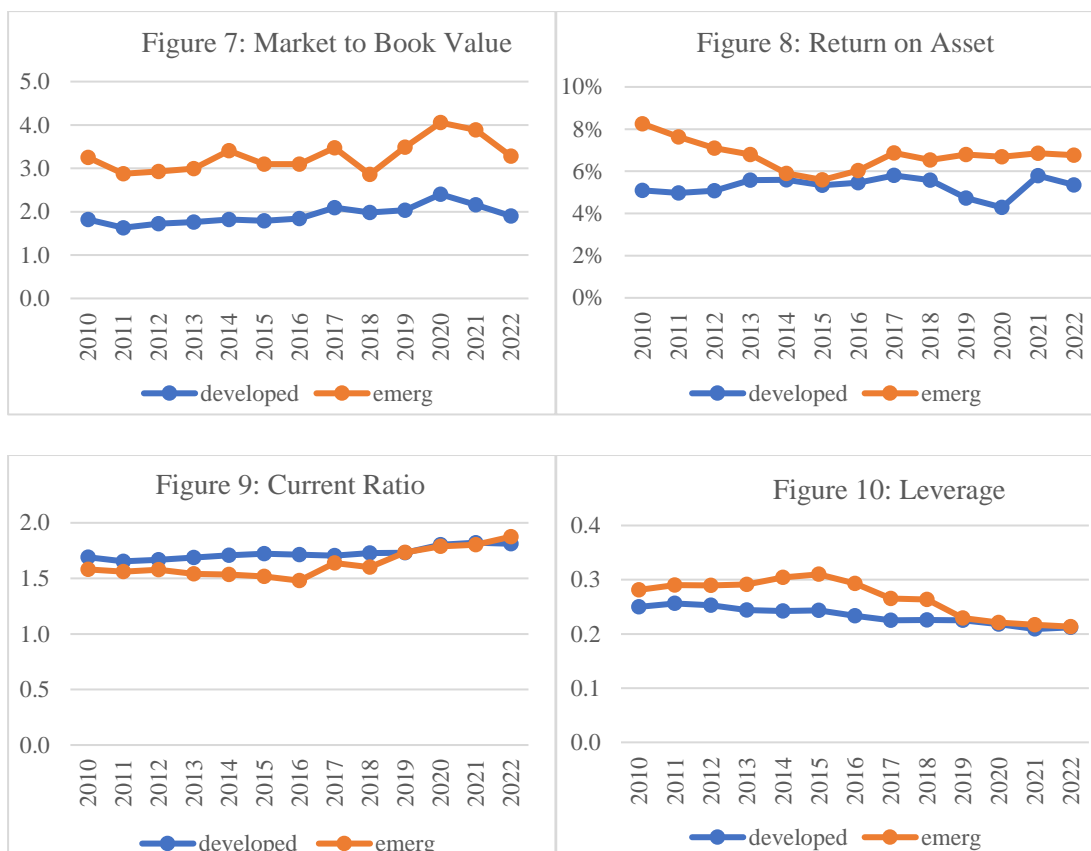
The evolution of probability of FDR and control variables over the study period from 2010 to 2022 are shown in figure 5 to 10. For the probability of FDR, both markets peaked in 2011, then generally decline until 2014. Post-2014, the developed market steadies around 12%, while the emerging market exhibits more fluctuation, ending

slightly below developed market by 2022. Overall, the probability of FDR within the developed market remains lower than emerging market as expected. In term of slack (cash), emerging market firms generally hold lower cash than that of the developed market. The level of cash holding of developed market steadily increase over the year, while the emerging market significantly increase post 2015 to a similar level with the developed market in 2022. It is evidence firms in both markets tend to hold on to more cash in during uncertainties of Covid 19 crisis.

The market to book (MTB) and the return on asset (ROA) on developed market exhibits similar trend. Both remain relatively steady throughout the sample period with slight decrease of ROA in 2018 and MTB in 2020 to 2022. For emerging market, the MTB hold steady around 3 times and experience sharp increase from 2018 to 2020, while the ROA had been declining from between 2010 to 2015 then increase to relatively stable level of around 7% between 2018 to 2022. As expected, the MTB of emerging market remain higher exhibiting higher growth prospects of firms in this market.

Looking at the debt related metrics, the current ratio of developed market is higher than that of emerging market as expected showing that firm in developed market have better short-term liquidity to repay its debt. While, the leverage of firm in the emerging market is higher due to the need to take on more debt to fulfill its growth prospects. Moreover, the leverage in both market decline to a similar level from 2020 to 2022 indicating firms taking on less debt during Covid 19 period while firms tend to have more cash reserve during this period.





Regression Results

This section presents the regression results aimed at testing the three primary hypotheses of the study. Additionally, further examinations are conducted to assess the robustness of the regression model and the consistency of its outcomes. To mitigate the potential issue of omitted variable bias arising from unobserved heterogeneity in the dataset, we have incorporated industry and year fixed effects into the model.

Furthermore, a check for multicollinearity have been conducted using a correlation matrix to ensure the reliability of the regression results. The correlation matrix reveals that the coefficients of the variables employed in the regression exhibit a relatively low level of correlation, all well below the threshold of 0.8. This finding underscores the absence of collinearity issues in our analysis, bolstering the accuracy of the results.

Representing in table 7 are the estimated results of various model nested in equation 3, the baseline regression. For model 1, the relationship between the probability of FDR proxied by Ohlson's O Score and the firm's ESG performance proxied by ESG

combine score is explored. The result of model 1 can clearly explain the variations in the probability of FDR of the firm. The beta coefficient of ESG combine score is negative and significant at 1% level explaining the relationship where an increase in ESG combine score leads to the decrease in probability of FDR. All else being equal, model 1 shows that one standard deviation (20.04) increased in ESG combine score translating into 0.33% decrease in probability of FDR.

The association between probability of FDR and ESG score in which ESG controversies of each individual firm is not considered is explored in model 2. In column 2 of table 7, the beta coefficient of ESG Score is negative and significant at 1% level showing the relationship where an increase in ESG Score leads to the decrease in probability of FDR. All else being equal, model 2 shows that one standard deviation (20.69) increased in ESG Score translating into 0.32% decrease in probability of FDR. The results of model 2 is consistent with the first model showing negative relationship between ESG performance proxied by ESG Score and probability of FDR. Although the magnitude of the impact of ESG score on probability of FDR (0.32%) is slightly less than that (0.33%) of the ESG combine score outlining the fact that the consideration of ESG controversies of the firm does not impact the overall firm's ESG performance and ultimately the probability of FDR of the firm.

The model 3, 4, and 5 analyzes the influence of the performance of individual pillar of ESG on the probability of FDR. By adding each pillar to the baseline regression model (equation 3) at a time, the effect of the environmental (E) pillar, social (S) pillar, and governance (G) pillar is investigated. The results of model 3 to 5 presents similar outcome for the "E" and "S" pillar, while the "G" pillar is differed. The findings of model 3 and 4 show that the beta coefficient of E and S pillar is negative and has significant explanatory power for probability of FDR at 1% level implying that an increasing performance in both E and S pillar leads to the decrease in probability of FDR. All else being equal, model 3 shows that one standard deviation (27.63) increased in E pillar score translating into 0.62% decrease in probability of FDR, while model 4 indicates that one standard deviation (24.32) increased in S pillar score translating into 0.32% decrease in probability of FDR.

From the result, it is evidenced that the magnitude and the impact of environmental pillar is more pronounced in reducing the probability of FDR in comparison with that of social pillar. Environmental engagement appears to yield considerable benefits. For instance, stakeholders, including customers, may be more willing to accept price increases or even reward environmentally responsible companies through their purchasing decisions (Habermann & Fischer, 2023). Additionally, a recent study has presented compelling evidence suggesting that banks place an additional value on the environmental performance of the entities they lend to (Habermann & Fischer, 2023). Hence, firms should prioritize the environmental aspect ESG in mitigating the probability of FDR.

The last model, model 4, shows that beta coefficient of G pillar is positive however it does not show any significant explanatory power for probability of FDR. Thus, the increasing of performance in G pillar is harmful to the firm as it has positive relationship with probability of FDR. The positive coefficient is explained by the fact that there is potentially a ceiling for governance related activities in which additional investment could lead to overinvestment and ultimately increase the probability of FDR. Recent study suggested that during economic upswings, firms' consistently high levels of governance might be excessive, potentially diverting management's attention from their primary business activities. It appears that, during such favorable economic periods, the costs associated with sustaining control and reporting mechanisms outweigh the benefits they offer (Habermann & Fischer, 2023).

Overall, the results of the baseline regression using equation (3) are in line with hypothesis one in which ESG performance is negatively associated with FDR. The incorporation of ESG strategies into a firm's operational framework demonstrates the capacity to mitigate overall risk, consequently leading to a reduction in FDR. Moreover, such strategic integration can enhance a firm's financial standing and improving its financing conditions. This, in turn, diminishes its vulnerability to FDR.

In term of control variables, the Slack variable is positive and significant at 1% level for all model indicating that higher slack or cash holding leads to increase in probability of FDR. This result in contrary with the expectation that firms with higher financial slack are believed to rely less on external financing and able to maintain

lower levels of debt. However, the positive coefficient can be attributed to the lack of profitable investment opportunities in which the firm is not effectively deploying its resources into these opportunities. Instead of reinvesting in the business or pursuing growth opportunities, the firm holds excess cash, which earns minimal returns. This underutilization of resources can lead to stagnation and increased probability FDR.

Similar to Slack, the market to book (MTB) variable is positive and significant at 1% level for all model indicating that higher MTB leads to high probability of FDR. The positive relationship is of the opposite of the expectation that firms with higher growth opportunities proxied by MTB tend to be more appealing to investors leading to easier access to external financing and lower financial constraints. The reason for the positive relationship is that high MTB often indicate overvaluation of the firm's assets and earnings potential resulting from overly optimistic expectations, speculative trading, or bubbles in the stock market. When these high expectations are not met, it can lead to a sharp correction in the firm's stock price, increasing the risk of FDR.

The ROA and Current Ratio variables are negative and significant at 1% level for all model implying that higher profitability and liquidity leads to lower probability of FDR. The negative relationship is in line with that of the expectation that firm with higher levels of profitability and ability to meeting debt obligations are expected to contribute to a firm's financial stability and potentially decrease its vulnerability to FDR.

The Leverage variable for all model is positive and significant at 1% showing that higher level of debt results in the increase in probability of FDR. The negative relationship supports the prediction that that firm with high debt may face financial vulnerability and thus potentially contribute to the FDR. The Size variable is positive and significant for model 3, environmental pillar, while positive and insignificant for all other models. The positive relationship is in line with the evidence that larger firms often exhibit higher debt ratios, which in turn increases their probability of bankruptcy.

Table 7: ESG Performance and the Probability of Bankruptcy

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Independent Variables</i>					
ESG Combine Score	-0.000166*** (4.27E-05)				
ESG Score		-0.000153*** (4.20E-05)			
E Pillar			-0.000225*** (3.30E-05)		
S Pillar				-0.000131*** (3.49E-05)	
G Pillar					2.78E-05 (3.51E-05)
<i>Control Variables</i>					
Slack	0.0538*** (0.0104)	0.0537*** (0.0104)	0.0526*** (0.0104)	0.0522*** (0.0105)	0.0586*** (0.0103)
MTB	0.0114*** (0.000419)	0.0114*** (0.000419)	0.0113*** (0.000420)	0.0114*** (0.000419)	0.0113*** (0.000419)
ROA	-1.116*** (0.0198)	-1.116*** (0.0198)	-1.115*** (0.0198)	-1.116*** (0.0198)	-1.119*** (0.0198)
Current Ratio	-0.0291*** (0.000987)	-0.0291*** (0.000987)	-0.0291*** (0.000988)	-0.0292*** (0.000988)	-0.0290*** (0.000987)
Leverage	0.274*** (0.00644)	0.273*** (0.00643)	0.274*** (0.00643)	0.276*** (0.00644)	0.274*** (0.00643)
Size	0.000742 (0.00165)	0.00402** (0.00174)	0.000314 (0.00162)	-0.00214 (0.00156)	0.00384** (0.00174)
Constant	0.130*** (0.0170)	0.129*** (0.0179)	0.0969*** (0.0168)	0.132*** (0.0164)	0.149*** (0.0180)
Observations	16,390	16,390	16,390	16,390	16,390
R-squared	0.466	0.466	0.467	0.466	0.465
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses

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

Economic Conditions

Table 8 presents the regression results of various model based on equation (4) examining the relationship between ESG performance on probability of FDR during the Covid 19 crisis where the dummy variable is introduced taking value of one for Covid 19 period and zero for non-Covid period. The period of 2020 to 2022 is identified as Covid period. The reason for this is that a more comprehensive analysis of the Covid 19 pandemic's longer-term effects on financial distress, including

recovery or sustained challenges risk is of the focus allowing for the examination of how firms' financial conditions evolved beyond the initial shock and whether there were lasting impacts on FDR. The interaction effect between ESG performance and dummy variable is used to investigate the aforementioned relationship.

Similar to the baseline regression, model 1 uses ESG Combine Score as a proxy for firm's ESG performance, while the probability of FDR is proxied by Ohlson's O Score. Consistent with the first hypothesis, the beta coefficient of the main effect, ESG Combine Score, is negative and significant at 1% level implying a negative relationship between ESG performance and probability of FDR where an increase in ESG Combine Score results in the reduction in probability of FDR.

However, under model 1, the interaction term representing the marginal effect of ESG Combine Score in addition to the main effect during Covid 19 period of model is positive and significant at 5% level indicating that there is a positive relationship where an increase in ESG Performance leads to the increase in probability of FDR during the Covid period. This is in line with hypothesis 2 where the impact of ESG performance on FDR depends on economic condition, in particular, crisis and non-crisis. However, the result is contradicted with the negative relationship prediction, where maintaining a commitment to ESG practices, even during a crisis, can contribute to reducing FDR by enhancing risk management capabilities, stakeholder relationships, and investor confidence. All else being equal, model 1 shows that one standard deviation (20.04) increase in ESG Combine Score translating into 0.38% increase in probability of FDR during the Covid 19 period dampening the main effect in the reduction of FDR.

The increase in the probability of FDR during the Covid 19 period, despite efforts to enhance ESG performance, can potentially be attributed to resource allocation and liquidity challenges. The firms that emphasized ESG activities during this period may have redirected significant resources, including capital and management attention, toward sustainability and social responsibility projects. While important for long-term sustainability, these activities could have diverted resources away from immediate financial stability and risk management, potentially hampering their ability to respond effectively to the crisis's financial challenges. Secondly, liquidity constraints likely

played a crucial role. The crisis brought unexpected disruptions to cash flow, declining revenues, and heightened uncertainty. Companies prioritizing ESG performance might not have had the required liquidity or financial flexibility to navigate these challenges effectively. Investments in ESG measures, often capital-intensive, might have strained available cash reserves, triggering liquidity issues during a period of economic downturn.

In addition to model 1, further analysis on each of the individual ESG pillar is conducted in order to investigate the effect of these pillar on the probability of FDR during the Covid 19 period. The model 2 to 4 represent the results for the E, S, and G pillar respectively. For all pillar, the main effect is negative and significant at 1% for E and S pillar, while the G pillar is negative but insignificant. The results are in line with previous results from the baseline regression under hypothesis one in table 7.

Looking the interaction effect for each model, model 2 representing the effect of E pillar, the result shows a positive and insignificant effect during the Covid 19 implying that engaging in environmental activities during the Covid 19 period have no impact in the probability of FDR. For model 3 and 4 representing the effect of S and G pillar, the result shows a positive and significant effect at 5% and 10% respectively. All else being equal, model 3 and 4 shows that one standard deviation increase in S (24.32) and G (22.39) pillar score translating into 0.35% and 0.30% increase in probability of FDR during the Covid 19 period dampening the main effect in the reduction of FDR. Consistent with model 1, the results are in accordance with hypothesis 2, while the sign contradicted with the prediction. It can be argued that for the involvement in socially responsible activities, where the increased costs associated with the areas like workforce, human rights, community, and product responsibility during Covid 19 periods might not yield immediate benefits, potentially leading to an increased likelihood of FDR (Habermann & Fischer, 2023). Meanwhile, investing in governance-related activities during times of crisis may be perceived as too delayed, or stakeholders may prioritize environmental concerns over governance issues (Habermann & Fischer, 2023).

Additionally, table 8 shows the beta coefficient for Covid 19 period (D_{covid}) to be positive and significant at 1% level for all model suggesting that during the time of

economic crisis, the probability of FDR increases. This is supported by the fact that during economic downturn, firms usually face reduction in revenue and other financial challenges contributing to the increase in probability of FDR. In terms for control variables, the results are consistent with the baseline regression reported in table 7 for all models.

In sum, the results of the regression using equation (4) are in line with hypothesis two where the impact of ESG performance on FDR depends on economic condition, in particular, crisis and non-crisis. However, a contradicting relationship is observed pointing to the notion that intensifying ESG activities during this period might have diverted substantial resources from addressing immediate financial stability and risk management. This diversion could potentially impede firms' capacity to effectively navigate the financial challenges posed by the crisis, consequently elevating the probability of FDR.

Table 8: ESG Performance and the Probability of Bankruptcy during Covid 19 Crisis

VARIABLES	Model 1	Model 2	Model 3	Model 4
<i>Independent Variables</i>				
ESG Combine Score	-0.000237*** (5.21e-05)			
ESG Combine Score*Dcovid	0.000191** (8.00e-05)			
E Pillar		-0.000248*** (3.86e-05)		
E Pillar*Dcovid		6.54e-05 (5.83e-05)		
S Pillar			-0.000187*** (4.34e-05)	
S Pillar*Dcovid			0.000143** (6.58e-05)	
G Pillar				-1.09e-05 (4.38e-05)
G Pillar*Dcovid				0.000134* (7.08e-05)
Dcovid	0.0216*** (0.00570)	0.0290*** (0.00511)	0.0242*** (0.00526)	0.0206*** (0.00572)
<i>Control Variables</i>				
Slack	0.0540*** (0.0104)	0.0526*** (0.0104)	0.0522*** (0.0104)	0.0591*** (0.0103)
MTB	0.0114*** (0.000420)	0.0113*** (0.000419)	0.0114*** (0.000420)	0.0113*** (0.000419)
ROA	-1.118*** (0.0198)	-1.116*** (0.0198)	-1.117*** (0.0198)	-1.120*** (0.0198)

Current Ratio	-0.0291*** (0.000987)	-0.0290*** (0.000987)	-0.0291*** (0.000988)	-0.0292*** (0.000988)
Leverage	0.274*** (0.00644)	0.273*** (0.00643)	0.274*** (0.00643)	0.276*** (0.00644)
Size	0.000709 (0.00165)	0.00393** (0.00174)	0.000327 (0.00162)	-0.00214 (0.00156)
Constant	0.133*** (0.0170)	0.0986*** (0.0180)	0.134*** (0.0169)	0.152*** (0.0164)
Observations	16,390	16,390	16,390	16,390
R-squared	0.466	0.467	0.466	0.466
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Standard errors in parentheses

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

Market Development

Table 9 shows the regression results of various model based on equation (5) investigating the relationship between ESG performance and probability of FDR of developed and emerging market in Asia-Pacific. The dummy variable is used where developed market takes the value of one, while emerging market takes the value of zero. And the relationship is analyzed through the use of the interaction effect of ESG performance and the dummy variable.

Under model 1, ESG Combine Score is used as a proxied for firm's ESG performance, while the probability of FDR is proxied by Ohlson's O Score. The beta coefficient of the main effect ESG Combine Score, is positive implying a positive relationship between ESG performance and probability of FDR where an increase in ESG Combine Score results in the increase in probability of FDR, however, it is insignificant and does not contain any explanatory power.

The interaction term between ESG Combine Score and developed market is negative and significant at 1% level showing a negative relationship between ESG Combine Score and probability of FDR where an increase in ESG Performance leads to the decrease in likelihood of FDR for developed market. Holding others constant, model 1 shows that one standard deviation (20.04) increase in ESG Combine Score translating into 0.79% decrease in probability of FDR in developed market. The result is aligned with hypothesis three where the impact of ESG performance on FDR depends on the level of market development, i.e., developed and emerging markets.

Furthermore, the observation that the magnitude of this impact is dependent on the maturity of ESG policies and practices, with developed markets typically exhibiting more advanced ESG frameworks, is substantiated by the negative sign and statistical significance of the interaction effect.

Model 2 to 4 present the results for the effect of each individual ESG pillar on the probability of FDR of developed market. The main effect for both E and S pillar is negative and significant at 10% and 1% respectively. On the contrary, the result of the G pillar is positive but insignificant. The relationship of each pillar on the probability of FDR is consistent with previous reported result in table 7.

In terms of the interaction effect, the beta coefficient of E pillar is negative and significant at 1% implying that an increase in E pillar score leads to the reduction of probability of FDR for developed market marginally adding to the reduction within the main effect. The same relationship can be observed for S pillar where the beta coefficient is negative and significant at 1%. While, the coefficient of G pillar negative but insignificant for developed market implying that engaging in governance activities have no impact in the probability of FDR. Holding others constant, model 2 and 3, representing E and S pillar, indicates that one standard deviation increases in E (27.63) and S (24.32) pillar score translating into 0.59% and 1.2% decrease in probability of FDR for developed market intensifying the reduction of FDR. In Asia-Pacific developed market, the magnitude of S pillar in influencing the likelihood of FDR is more pronounced than that of the E pillar suggesting that strong emphasis is placed on social harmony, labor relations, and community welfare. Consequently, improvements in social dimensions, such as workforce management, human rights, and community engagement, carry more weight in the eyes of stakeholders and investors.

Table 9 also report the beta coefficient for developed market ($D_{developed}$) and control variables. The coefficient of developed market is positive and significant at 1% level for model 1 to 3 suggesting that the likelihood of FDR is larger in developed market. Several reasons can help explains this counterintuitive relationship. Firstly, the maturity of developed market provides firms greater access to debt financing, resulting in larger debt levels. Secondly, while better credit ratings grant access to

favorable debt terms, firms that accumulate excessive debt relative to their financial capacity can still be vulnerable to FDR. Lastly, the prevalence of larger firms in developed markets, requiring more capital for expansive operations, further contributes to increased debt levels. In terms for control variables, the results are consistent with the baseline regression reported in table 7 for all models.

In summary, the regression results presented in equation (5) provide support for hypothesis three, which posits that the impact of ESG performance on FDR depends on the level of market development, i.e., developed and emerging markets. This impact is influenced by the maturity of ESG policies and practices, as well as the distinct characteristics of each market. Developed markets typically exhibit more advanced ESG frameworks. The findings demonstrate that developed markets experience a positive marginal effect from improving ESG performance, intensifying the reduction in the probability of FDR.

Table 9: ESG Performance and the Probability of Bankruptcy for Developed Market

VARIABLES	Model 1	Model 2	Model 3	Model 4
<i>Independent Variables</i>				
ESG Combine Score	7.71e-05 (7.04e-05)			
ESG Combine Score*Ddeveloped	-0.000394*** (8.43e-05)			
E pillar		-9.54e-05* (5.47e-05)		
E Pillar*Ddeveloped		-0.000214*** (6.26e-05)		
S Pillar			-0.000156*** (5.51e-05)	
S Pillar*Ddeveloped			-0.000480*** (6.83e-05)	
G Pillar				7.18e-05 (6.05e-05)
G Pillar*Ddeveloped				-5.61e-05 (7.36e-05)
Ddeveloped	0.0209*** (0.00399)	0.0134*** (0.00297)	0.0239*** (0.00335)	0.00559 (0.00405)
<i>Control Variables</i>				
Slack	0.0542*** (0.0104)	0.0505*** (0.0104)	0.0547*** (0.0105)	0.0577*** (0.0104)
MTB	0.0117*** (0.000435)	0.0117*** (0.000434)	0.0118*** (0.000435)	0.0115*** (0.000435)
ROA	-1.115*** (0.0198)	-1.113*** (0.0198)	-1.115*** (0.0198)	-1.118*** (0.0198)

Current Ratio	-0.0290*** (0.000987)	-0.0289*** (0.000987)	-0.0290*** (0.000986)	-0.0292*** (0.000988)
Leverage	0.274*** (0.00646)	0.274*** (0.00645)	0.275*** (0.00645)	0.276*** (0.00647)
Size	0.00206 (0.00167)	0.00507*** (0.00175)	0.00231 (0.00164)	-0.00198 (0.00157)
Constant	0.102*** (0.0178)	0.0761*** (0.0185)	0.0947*** (0.0176)	0.143*** (0.0169)
Observations	16,390	16,390	16,390	16,390
R-squared	0.467	0.468	0.468	0.466
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Standard errors in parentheses

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

Robustness and Additional Analysis

The empirical results so far support the hypothesis that the ESG performance of the firm has negative relationship with probability of FDR in which the increase in ESG performance resulting in the reduction of the likelihood of FDR. Additional analysis is performed to check whether the results are consistent and to get better understanding of the relationship between ESG performance and the probability of FDR.

Time Lag Effect

Previous results did not take into the account the time lag effect of ESG implementation on the likelihood of FDR. Changes a company makes in its ESG practices potentially don't show immediate results in its financial performance. For instance, when a company commits to enhancing its social responsibility by investing in employee well-being or community engagement, the outcomes of these efforts may not be immediately evident in the increase in financial performance of the firm. By lagging the ESG variable by one year, it accounts for this gap, allowing for a more accurate assessment of how ESG actions translate into financial impacts over time.

Additionally, lagging helps address the reverse causality concerns. Without the lagged effect, a significant negative relationship between ESG performance and likelihood FDR within the same year could be misleadingly suggesting that ESG initiatives promptly lead to reduced FDR. While in fact this observed relationship might be due to the reverse scenario where firms already experiencing lower FDR may be more

inclined to invest in ESG improvements. The lagged effect of ESG implementation is supported by several prior studies (Jitmaneeroj, 2023).

Table 10 provide the results of the robustness check by lagging the ESG variables by one year. The results for all model are significant and qualitatively align with that of the baseline regression presented in table 7 providing the evidence on the robustness of the models used in this study.

Table 10: ESG Performance and the Probability of Bankruptcy with lag ESG variables

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Independent Variables</i>					
ESG Combine Score	-0.000168*** (4.80E-05)				
ESG Score		-0.000159*** (4.71E-05)			
E Pillar			-0.000231*** (3.67E-05)		
S Pillar				-0.000145*** (3.95E-05)	
G Pillar					2.94E-05 (3.95E-05)
<i>Control Variables</i>					
Slack	0.0552*** (0.0121)	0.0550*** (0.0121)	0.0536*** (0.0120)	0.0528*** (0.0121)	0.0602*** (0.0120)
MTB	0.0119*** (0.000492)	0.0119*** (0.000492)	0.0118*** (0.000491)	0.0119*** (0.000492)	0.0118*** (0.000492)
ROA	-1.167*** (0.0233)	-1.167*** (0.0233)	-1.166*** (0.0232)	-1.166*** (0.0233)	-1.169*** (0.0233)
Current Ratio	-0.0302*** (0.00114)	-0.0302*** (0.00114)	-0.0301*** (0.00114)	-0.0302*** (0.00114)	-0.0303*** (0.00114)
Leverage	0.277*** (0.00731)	0.277*** (0.00732)	0.276*** (0.00731)	0.278*** (0.00731)	0.279*** (0.00731)
Size	0.000206 (0.00188)	0.000343 (0.00191)	0.00360* (0.00198)	-2.43e-05 (0.00185)	-0.00266 (0.00178)
Constant	0.161*** (0.0192)	0.160*** (0.0194)	0.128*** (0.0202)	0.162*** (0.0191)	0.181*** (0.0186)
Observations	12,992	12,992	12,992	12,992	12,992
R-squared	0.469	0.469	0.47	0.469	0.468
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in parentheses

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

Complete Model

Previously the market condition (covid) and the level of market development (developed) are considered as separate regression in order to test hypothesis two and three. In this section, both market condition and level of market developed is included in the same regression as shown in equation 6 in order to test the result of the complete model.

$$FD_{i,t} = \beta_0 + \beta_1 ESG + \beta_2 D_{developed} + \beta_3 ESG * D_{developed} + \beta_4 D_{Covid} + \beta_5 ESG * D_{Covid} + \beta_6 X_{i,t} + industryFE + yearFE + \epsilon_{i,t} \quad (6)$$

The results of the complete model are shown in Table 11. The ESG combine score as well as its constituent pillars are significant and qualitatively correspond with the regression shown in earlier section, demonstrating the robustness of the models utilized in this study. In summary, the increase in ESG performance led to (1) the reduction in the likelihood of FDR, (2) the marginal increase in probability of FDR during Covid 19 period dampening its main effect in reducing probability of FDR, and (3) the marginal decrease in probability of FDR for developed market increasing the main effect in reducing probability of FDR.

Table 11: Complete Model including Market Condition and Level of Market Development Dummies

VARIABLES	Model 1	Model 2	Model 3	Model 4
<i>Independent Variables</i>				
ESG Combine Score	-0.000158** (8.19e-05)			
Ddeveloped	0.0197*** (0.00409)	0.0134*** (0.00305)	0.0235*** (0.00344)	0.00403 (0.00414)
ESG Combine Score*Ddeveloped	-0.000371*** (8.61e-05)			
Dcovid	0.0274*** (0.00584)	0.0336*** (0.00522)	0.0320*** (0.00541)	0.0218*** (0.00581)
ESG Combine Score*Dcovid	0.000106* (8.20e-05)			
E Pillar		-9.90e-05 (6.26e-05)		
E Pillar*Ddeveloped		-0.000212*** (6.43e-05)		
E Pillar*Dcovid		7.12e-06 (6.00e-05)		
S Pillar			-0.000138** (6.51e-05)	
S Pillar*Ddeveloped			-0.000473*** (6.98e-05)	
S Pillar*Dcovid			3.58e-05 (6.75e-05)	
G Pillar				2.65e-06 (7.20e-05)
G Pillar*Ddeveloped				-2.38e-05 (7.58e-05)

G Pillar*Dcovid				0.000129* (7.29e-05)
Control Variables				
Slack	0.0542*** (0.0104)	0.0505*** (0.0104)	0.0546*** (0.0105)	0.0580*** (0.0104)
MTB	0.0117*** (0.000435)	0.0117*** (0.000434)	0.0118*** (0.000435)	0.0115*** (0.000435)
ROA	-1.116*** (0.0198)	-1.113*** (0.0198)	-1.115*** (0.0198)	-1.118*** (0.0198)
Current Ratio	-0.0290*** (0.000987)	-0.0289*** (0.000987)	-0.0290*** (0.000986)	-0.0291*** (0.000988)
Leverage	0.274*** (0.00646)	0.274*** (0.00645)	0.275*** (0.00645)	0.277*** (0.00647)
Size	0.00197 (0.00167)	0.00505*** (0.00176)	0.00228 (0.00164)	-0.00205 (0.00157)
Constant	0.105*** (0.0179)	0.0764*** (0.0187)	0.0957*** (0.0177)	0.147*** (0.0171)
Observations	16,390	16,390	16,390	16,390
R-squared	0.467	0.468	0.468	0.466
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

CONCLUSIONS

The relationship between a firm's ESG performance and its likelihood of FDR was the focal point of this research. Through various models and empirical tests, the study provides evidence that improved ESG performance is linked to a reduction in FDR. This relationship suggests that firms that prioritize and effectively implement ESG initiatives are better positioned to manage risks, strengthen stakeholder relationships, and enhance investor confidence. In addition, the study revealed additional evidences when considering individual pillars of ESG. While the environmental and social pillars generally contributed to a decrease in FDR, the governance pillar presented a mixed relationship, indicating the potential pitfalls of overinvestment in governance activities.

The research also highlighted that the impact of ESG performance on probability of FDR is influenced by external factors such as economic conditions and the level of market development. During times of economic crisis, in particular the Covid 19 pandemic, firms emphasizing ESG practices faced an increased likelihood of FDR. This unexpected relationship can be attributed to the potential diversion of resources from immediate financial stability needs to ESG activities, highlighting the complexity of navigating both ESG priorities and financial stability during crisis. When comparing developed and emerging markets, the results shows that ESG

practices have a more pronounced positive impact in developed markets. This is likely because these markets possess more mature ESG frameworks and place a higher emphasis on ESG compliance and performance.

The findings of this study hold important implications for various stakeholders. For investors, this research serves as a valuable guide for making informed investment decisions. Investors can more effectively identify financially stable and sustainable companies in which to allocate their resources, thereby promoting responsible and impactful investments.

For managers, the study offers insights into the formulation of business strategies that incorporate ESG practices. This integration can enhance a firm's resilience and overall performance by strategically allocating resources and emphasizing transparency in ESG reporting as well as ensuring long-term sustainability and financial stability.

Policymakers can also benefit from this research as it informs the design of regulations and policies. These findings can encourage and incentivize ESG integration while mitigating financial distress risk. Given that ESG performance demonstrates a relatively stronger reduction effect on the likelihood of FDR in developed markets compared to emerging markets, policymakers in emerging markets should carefully examine the ESG practices implemented by their counterparts in developed markets in which emerging markets can potentially amplify the positive impact of ESG performance on reducing the risk of FDR. This cross-market exchange of knowledge and practices can lead to more effective ESG policies in emerging economies, contributing to greater financial stability and resilience for businesses operating in these regions.

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