



Exploring the Nexus of ESG, Family Firms, and Financial Risk in Indonesia

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Submitted:22/07/2025

Accepted:10/09/2025

Published:30/09/2025

ABSTRACT

This study examines the nexus understood as the direct linkage between environmental, social, and governance (ESG) performance and financial risk, as well as the role of ownership structure (family vs. non-family) in that relationship. Although the existing literature provides mixed evidence on how ESG affects financial risk, it remains unclear whether ownership structures that often emphasize long-term orientation are better able to mitigate financial risk. To fill this gap, the study introduces a framework that incorporates ownership structure into the analysis of the ESG–financial risk relationship, with a specific focus on firms in Indonesia. Using fixed effect model panel regressions on 462 firm-year observations, the results show that stronger ESG performance is associated with lower financial risk. Ownership structure both family and non-family is not significantly correlated with financial risk and does not moderate the relationship between ESG performance and financial risk. These findings assist investors and portfolio managers in evaluating how ESG performance, ESG controversies, and ownership structure affect firm-level financial risk and improve investment decision-making.

Keywords: ESG, DAR, DER, Family Ownership, Financial Risk

INTRODUCTION

Over the past several decades, embedding Environmental, Social, and Governance (ESG) considerations into corporate strategy has become critical for firms seeking to sustain themselves and remain competitive on the global stage. ESG encompasses three core domains environmental responsibility, social welfare, and ethical, transparent governance which not only help companies meet stakeholder expectations but also serve to reduce various

operational risks, including financial exposures (Verheyden et al., 2016; Wu & Xie, 2024; Zhou et al., 2023; Zhu & Yang, 2024). This heightened focus on ESG is driven by pressing worldwide issues such as climate change, widening social disparities, and calls for stronger accountability in corporate leadership. As a result, both investors and regulatory bodies increasingly prioritize enterprises with robust ESG records, viewing them as more capable of navigating market fluctuations and external shocks (Mo et al., 2024; Stiadi, 2023; Wei & Zeng, 2024).

Empirical studies indicate that organizations with a systematic approach to ESG integration tend to enjoy easier capital access, lower financing costs, and enhanced prospects for sustained performance over the long term (Clark et al., 2015; Shakil, 2021; Wu & Xie, 2024; Yu & Xiao, 2022).

The disclosure of Environmental, Social, and Governance (ESG) information has become critically important in today's fiercely competitive markets. Companies that neglect social obligations or become embroiled in environmental or social scandals often face investor disapproval (Aouadi & Marsat, 2018; Behl et al., 2022; Kim & Yoon, 2024; Yu & Xiao, 2022). Adverse media coverage stemming from issues like ethical violations or product missteps can provoke strong investor reactions, amplifying share-price volatility and elevating corporate risk profiles (Dorfleitner et al., 2015; Kim et al., 2023; Shangguan et al., 2024). Conversely, firms that demonstrate exemplary ESG performance typically experience lower risk and diminished stock fluctuations (Jo & Na, 2012; Lueg et al., 2019; Sassen et al., 2016; Shakil, 2021), whereas negative ESG events correlate with heightened financial uncertainty (Suttipun, 2023; Wei & Zeng, 2024). Despite this established ESG–risk nexus, comparatively little research has contrasted its effects in family-owned versus non-family enterprises.

Strategic adoption of ESG practices carries unique implications for both family and non-family firms. Research by Espinosa-Méndez et al. (2023) found that family businesses display greater sensitivity to ESG considerations, largely due to their emphasis on socioemotional wealth (SEW). Under the SEW framework, family firms prioritize reputation preservation, familial legacy, and enduring viability, which incentivizes ESG integration as a means to secure legitimacy and long-term objectives. However, financial constraints and agency costs may modulate this relationship, yielding heterogeneous outcomes among family enterprises. In such

contexts, cost-efficient initiatives like ESG implementation can lower operational expenses, boost profitability, and consequently reduce aggregate corporate risk.

Theoretical insights from pecking-order and risk-management perspectives further clarify how ESG influences firm risk. Pecking-order theory posits that transparent ESG reporting enhances reputational capital, strengthens investor confidence, and reduces both systemic and firm-specific uncertainties (Triyani et al., 2021). Moreover, ESG commitments signal a firm's alignment with stakeholder and societal interests; failing to uphold these commitments risks severe reputational damage and escalated stock volatility (Dincă et al., 2022; Siwei & Chalermkiat, 2023; Velte, 2020). From a risk-management standpoint, boards are tasked with devising policies to mitigate potential losses from uncertain events (Kytte & Ruggie, 2005). For example, firms often legitimize their social and environmental initiatives to avert regulatory sanctions and fines associated with ESG controversies (Benlemlih & Girerd-Potin, 2017; Xu et al., 2021; Zhou et al., 2023). Additionally, proactive reductions in carbon emissions and pollution can lower litigation exposure, thereby improving financial outcomes and curtailing overall risk (Sharfman & Fernando, 2008).

In the Indonesian context, accelerating global expectations have spurred greater ESG engagement among publicly listed companies, with the Financial Services Authority (OJK) encouraging formal sustainability reporting to bolster transparency and social accountability. Indonesia's resource-intensive sectors mining, oil and gas, and agribusiness face pronounced ESG challenges, including environmental degradation and community conflicts, which can exacerbate financial uncertainties (Stiadi, 2023; Wahyuningtyas et al., 2024). Here, ESG integration may serve both as a hedging mechanism against adverse impacts and as a driver of

international competitiveness. Although evidence from advanced economies suggests ESG adoption can stabilize share prices, reduce default probabilities, and foster long-term value creation (Hazen, 2020; Murè et al., 2021; Sassen et al., 2016; Velte, 2017), it remains an open empirical question whether these advantages fully extend to emerging markets such as Indonesia.

This study examines the relationship between ESG practice implementation and firm risk levels using a more nuanced approach. Unlike earlier research that evaluated only the impact of corporate social responsibility (CSR) on firm value (Andanawarini et al., 2024; Aouadi & Marsat, 2018; Siwei & Chalermkiat, 2023), financial performance (Dalal & Thaker, 2019; Velte, 2020; Wei & Zeng, 2024), reputation (Murè et al., 2021). This paper disaggregates financial risk into two principal components: the debt-to-asset ratio (DAR) and the debt-to-equity ratio (DER). While measuring firm value alone offers stakeholders a financial snapshot, it does not fully capture the firm's risk exposure. By treating DAR and DER separately, the study seeks to provide a more comprehensive understanding of how capital structure both the proportion of debt relative to assets and to equity influences a company's financial vulnerability.

Several prior studies have also investigated the relationship between ESG factors and corporate risk levels, much like the present research. However, there are fundamental distinctions between those studies and ours. One study examined this relationship in the European market, where corporate social responsibility (CSR) is mandated by regulation (Sassen et al., 2016). In contrast, our research focuses on firms in Indonesia, where CSR adoption remains voluntary. Moreover, another study was confined to the oil and gas sector when assessing the ESG–risk nexus (Shakil, 2021), whereas the current study encompasses all industry categories.

The importance of this study stems directly from that empirical gap and from

significant practical needs. First, by explicitly comparing family-owned and non-family firms in an emerging-market setting, this research addresses a conspicuous void in the literature: prior work predominantly examines developed markets or single industries, limiting external validity where ownership concentration and socioemotional wealth considerations are prevalent. Second, the study provides timely, action-able evidence for policymakers and regulators such as the OJK who are debating the scope, timing, and enforcement of mandatory sustainability reporting and sustainable-finance initiatives; empirical findings about ESG's effect on firm risk can help calibrate regulatory thresholds and disclosure requirements. Third, the results will inform investors and lenders that increasingly rely on ESG metrics to evaluate risk-adjusted returns and set lending covenants or cost-of-capital decision especially important for Indonesian firms seeking international capital. Fourth, the paper offers managerial relevance by clarifying whether ESG investments yield risk-mitigating benefits for family firms that prioritize socioemotional wealth versus non-family firms focused on economic efficiency, thereby guiding internal capital allocation and governance reforms.

The present study therefore seeks to examine the relationship between ESG implementation and financial risk within both family-owned and non-family firms. Using a quantitative methodology, the analysis will combine ESG performance data from publicly listed Indonesian companies with various financial risk indicators such as market valuation, firm size, sales growth, and profitability. In exploring the link between ESG practices and financial risk in the Indonesian context, this research aims to contribute to the academic literature while also providing practical insights for policymakers, investors, and corporate decision-makers.

LITERATURE REVIEW

ESG Performances and Financial Risk

ESG performance represents the degree to which an organization addresses its environmental, social, and governance responsibilities, with its ESG score serving as a key metric for evaluating corporate accountability. Elevated ESG performance signifies a greater commitment to corporate responsibility, which is associated with diminished information asymmetry and lower stock-price volatility (Lueg et al., 2019; Shakil, 2021). Conversely, companies exhibiting poor ESG performance are prone to higher market volatility, largely due to reduced accountability measures. Empirical research has demonstrated a significant inverse relationship between corporate social performance (CSP) and firm risk (Eratalay & Cortés Ángel, 2022; Maccarrone et al., 2024; Sassen et al., 2016). Despite these findings, the specific impact of ESG performance on financial risk especially within family-owned enterprises remains underexplored. In contrast, prior investigations have predominantly focused on CSR reporting practices (Taylor et al., 2018), the association between CSR and profitability (Desmita & Sihombing, 2024; Hassel & Semenova, 2013; Sidarta et al., 2023), the dual effects of CSR on financial performance (Surroca et al., 2010; Velte, 2020), and CSR's influence on corporate governance (Nurfadilah, 2024). Notably, CSR reporting is largely influenced by the institutional context within which firms operate (Bashtovaya, 2014), and corporate profitability is closely linked to effective CSR implementation (Taylor et al., 2018). Additionally, employee engagement is pivotal to CSR success (Hur et al., 2018), as such initiatives are critical for fostering trust and robust relationships within the workforce (De Roeck & Delobbe, 2012). Prior studies have also emphasized multiple dimensions of sustainability including

corporate reputation, public perception, CSR reporting, and CSR strategy (Aguilera-Caracuel et al., 2017; Choumert-Nkolo, 2018) employing methodologies such as content analysis (Bashtovaya, 2014), case studies (Bolton et al., 2011; Dincă et al., 2022), interviews (Arena et al., 2018). Yet, despite these advances, empirical examination of ESG performance with an emphasis on family firms remains notably limited.

Research across various sectors has also explored the relationship between ESG performance and financial outcomes specifically, its effects on stock value and profitability. These studies reveal that robust ESG performance can significantly influence firm profitability and market valuation, as evidenced in the banking sector (Aboud & Diab, 2018; Negara et al., 2024; Shakil, 2022; Yamaguchi, 2008). Poor ESG performance, on the other hand, frequently results in market penalties imposed by stakeholders. According to the pecking order theory, firms resort to external financing only when internal funds are inadequate; nevertheless, investments in ESG initiatives such as energy-efficiency projects or social programs can generate cost savings and tax incentives, thereby bolstering internal cash flows (Ktit & Abu Khalaf, 2024). Consequently, firms that demonstrate leadership in ESG tend to fund sustainability initiatives through retained earnings instead of accruing additional debt, leading to lower financial leverage and a reduced likelihood of financial distress due to diminished interest expenses and a more conservative capital structure. Furthermore, by engaging in environmental and social initiatives, firms accumulate moral capital (Godfrey, 2005), which functions as a form of insurance by providing protection during economic downturns. Risk-management theory further suggests that superior ESG performance can serve to shield companies

during adverse market conditions (Benlemlih & Girerd-Potin, 2017; Sharfman & Fernando, 2008), and empirical studies support this view by demonstrating that effective ESG practices substantially reduce firm risk (Benlemlih & Girerd-Potin, 2017; Chakraborty, 2010). On this basis, it is plausible to anticipate that enhanced ESG performance may mitigate overall corporate risk a proposition that underpins the present study's inquiry. Accordingly, we hypothesize:

H1a: Higher ESG performance is associated with lower financial risk.

Although ESG is widely regarded as an instrument for reducing risk and enhancing financial outcomes, certain studies suggest that its implementation may also have adverse implications for a firm's financial risk profile. Drawing on pecking order theory, ESG investments can reduce internal cash reserves namely retained earnings compelling firms to rely on higher-cost debt financing. This shift leads to increased leverage and, consequently, greater financial risk (Dash & Sethi, 2024). Essence, suboptimal ESG results may prompt companies to forgo retained earnings in favor of expensive borrowings, thereby expanding their financial exposure. Additionally, some literature points out that attempting to meet the full spectrum of stakeholder expectations can create conflicting priorities. For instance, an excessive emphasis on environmental sustainability might come at the cost of short-term profitability, ultimately diminishing investor returns (Clark et al., 2015; Shah & Guild, 2022).

Moreover, ESG factors appear to influence stock-price volatility. According to Schoenmaker (2021) companies with high ESG scores do not consistently exhibit strong capital market performance. One contributing factor is that high investor expectations for ESG-leading firms, when

unmet, can result in precipitous declines in share value, thereby amplifying market volatility. This dynamic is particularly evident in industries that are heavily regulated or depend on commodity markets, where external factors such as regulatory changes can substantially affect financial performance (Benlemlih & Girerd-Potin, 2017; Champagne et al., 2022). Accordingly, we hypothesize:

H1b: Higher ESG performance may be associated with higher financial risk.

Family Firms and Financial Risk

Family firms have attracted significant attention in finance and management literature due to their distinctive characteristics affecting decision-making, business strategy, and financial outcomes. Anderson and Reeb (2003) find that family firms exhibit lower earnings volatility than non-family firms, as they exercise greater prudence in managing assets and liabilities. Concentrated family ownership provides stronger incentives for management to maintain financial stability. Villalonga and Amit (2010) argue that family firms employ lower leverage and tend to avoid excessive risk-taking. Prior research thus suggests that family firms enjoy several advantages in managing financial risk compared to non-family firms.

According to pecking order theory Myers and Majluf (1984), firms will first use the cheapest and least information-asymmetric source of finance retained earnings (internal financing) then debt, and only as a last resort issue equity. Family firms often have easier access to retained earnings because they face less capital-market pressure to distribute high dividends; instead, they typically retain earnings for family succession and long-term investment (Jansen et al., 2023). Using a sample of U.S. firms (Anderson & Reeb, 2003) show that family firms have lower income volatility than non-family firms, and

(Miller et al., 2014) report that they experience lower bankruptcy rates during economic crises. Their cautious approach and emphasis on long-term relationships (Ward & Aronoff, 2011) further support this resilience.

H2a: Family firms have lower financial risk than non-family firms.

However, although family-firm values play a crucial role in shaping corporate identity and fostering internal loyalty, these same values can also contribute to heightened financial risk. Family firms often prioritize long-term sustainability and maintain close personal relationships with customers, yet they may be reluctant to pursue risks that conflict with core family principles (Espinosa-Méndez et al., 2024; Espinosa-Méndez et al., 2023; Miller et al., 2014). While these values confer stability and competitive advantage, they can also impede adaptation to changing business environments (Espinosa-Méndez et al., 2024). According to Gómez-Mejía et al. (2007), family firms tend to avoid high-risk strategies even when such strategies might enhance profitability. This reluctance is often driven by a desire to preserve the family legacy, which can slow corporate responses to market dynamics and increase financial risk.

Furthermore, Berrone et al. (2012) reveal that family firms frequently prioritize family interests over economic efficiency. For example, appointing less-qualified family members to strategic positions can lead to suboptimal business decisions and elevated financial risk. Family firms also tend to resist diversifying their business portfolios out of fear of losing control or straying from core family values. This lack of diversification can amplify exposure to sector-specific risks, particularly during periods of economic instability (Hernández-Linares et al., 2017; Villalonga & Amit, 2010;

Ward & Aronoff, 2011). Accordingly, we propose the following alternative hypothesis:

H2b: Family firms have higher financial risk than non-family firms.

ESG, Family Firms and Financial Risk

The relationship between Environmental, Social, and Governance (ESG) practices and financial risk has attracted growing interest from scholars and practitioners. ESG initiatives are expected to reduce financial risk by strengthening corporate governance, enhancing stakeholder trust, and lowering exposure to environmental and social controversies. However, a family firm's resistance to external influence and its preference for preserving control may limit the thorough adoption of ESG strategies. Al Rawaf and Alfalih (2024) note that conflicts of interest, lack of professional management, and a tendency to prioritize family interests can undermine ESG benefits. Gómez-Mejía et al. (2007) similarly observe that family firms often face trade-offs between family priorities and long-term corporate sustainability. When family leadership emphasizes short-term gains or neglects sound governance practices, the positive effect of ESG on financial risk may weaken or even reverse. Moreover, Liang and Huang (2024) argue that family firms tend to adopt ESG initiatives more slowly, increasing their financial risk exposure. These findings suggest that the success of ESG in reducing financial risk depends critically on the quality of family governance.

This study is important because few investigations have examined how family influence affects ESG implementation and, in turn, financial risk. Geng et al. (2023) report that the lack of independent oversight and external perspectives in family-controlled firms can lead to insufficient attention to ESG factors especially in areas such as labor rights,

diversity, and environmental management. Latrous et al. (2024) similarly find that family firms often focus narrowly on shareholder interests and pay less heed to broader stakeholder groups, including employees, local communities, and the environment. This limited perspective can result in inadequate ESG consideration in business decisions, ultimately raising financial risk. Therefore, we hypothesize:

H3a: Family-firms negatively moderates the relationship between ESG and financial risk.

On the other hand, robust ESG practices can help firm family-owned or otherwise reduce financial risk. Companies with strong ESG policies are better equipped to manage social and environmental challenges and to avoid legal or regulatory penalties that raise operating costs. Such firms often exhibit superior financial performance because they anticipate and mitigate non-financial risks (Anderson & Reeb, 2003; Friede et al., 2015; Geng et al., 2023). Family firms, in particular, tend to care deeply about the social and environmental impacts of their decisions, viewing business sustainability as part of the family legacy (Susanto et al., 2024). As a result, they may be more motivated to implement effective ESG practices, thereby reducing long-term financial risk.

Basco (2017) shows that sustainability in family firms is frequently driven by family identity and inherited values. Thus, in the context of family businesses, ESG implementation can be seen as an effort to protect reputation and ensure long-term viability, which in turn positively influences financial risk management. Accordingly, we propose the alternative hypothesis:

H3b: Family-firms positively moderates the relationship between ESG and financial risk.

Method, Data, and Analysis

For this study, we assembled a dataset of firms listed on the Indonesian stock exchange covering the period from 2018 through 2023. We chose these years to capture both the pre-pandemic and post-pandemic effects of COVID-19. To ensure data consistency and reliability, we included financial-sector firms and excluded any companies with incomplete key data, thereby preserving the robustness of our analysis.

ESG scores and financial data were sourced from Refinitiv, with sample selection appropriate to the firms and the model required by the researcher. ESG scores range from 0 to 100 and evaluate a company's performance across environmental, social, and governance dimensions based on disclosed information. A higher score indicates stronger ESG practices across all three pillars (Bofinger et al., 2022). We classified a firm as a "family firm" (assigned a value of 1) if a single individual or family held majority share ownership; otherwise, it was classified as a non-family firm (value of 0). Our final, unbalanced panel comprises 77 firms and 462 firm-year observations, including 214 observations for family firms and 248 for non-family firms.

We employ a panel regression framework with a fixed-effects model. A Hausman test yielded a p-value below 0.05, confirming that the fixed-effects specification is more appropriate than a random-effects model. We also conducted additional classical assumption tests including a normality test with a result greater than 0.05, indicating that the data are normally distributed. The Breusch-Pagan test for heteroskedasticity with a result greater than 0.05, indicating that there is no heteroskedasticity in the analyzed data.

To assess the hypothesized relationship between ESG performance and

financial risk, we estimate the following multivariate regression model:

$$RISK_{i,t} = \alpha_{i,t} + \beta_1 ESG_{i,t} + \sum_{k=0}^n \beta_k Z_{k,i,t} + e_{i,t} \quad (1)$$

The RISK variable is measured using DAR and DER. DAR is calculated by dividing total debt by total assets, while DER is calculated by dividing total debt by total equity. ESG refers to the ESG performance score. The term "e" denotes the residual or error term in the regression model. The subscript "i" represents individual firms, and "t" refers to different time points within the years under investigation.

The letter "Z" indicates the inclusion of firm-specific control variables, as commonly used in previous studies. First, we include ROA, which represents firm profitability, measured by net income divided by total assets. Veeravel et al. (2024) state that firms with better ESG disclosure tend to have higher financial performance, in contrast to firms with more unstable financial performance.

Second, we include MVAL, which represents firm market valuation, measured using the natural logarithm of market value. Bashatweh et al. (2023) suggest that corporate sustainability practices can enhance investor trust and, in turn, increase market valuation.

Third, we include GROWTH, which represents sales growth, measured by subtracting the previous period's sales from the current period's sales, then dividing by the previous period's sales. Nisaakmala and Umar (2024) argue that firms with high sales growth and strong ESG practices are more likely to comply with tax obligations and demonstrate better financial performance. Lastly, we employ SIZE, which represents firm size, measured by the natural logarithm of total assets. D'Amato and Falivena (2020)

suggest that larger and/or more mature firms may possess specific resources such as financial stability, higher visibility, and an established reputation, which can enhance the effectiveness of ESG practices unlike smaller and/or newer firms. Next, we estimate the following equation to address our second hypothesis:

$$RISK_{i,t} = \alpha_{i,t} + \beta_1 Family_{i,t} + \sum_{i=0}^n \beta Z_{i,t} + e_{i,t} \quad (2)$$

We replaced the focus variable from ESG to Family. Family is a dummy variable that takes the value of 1 if the majority of shares are owned by an individual (i.e., family ownership), and 0 otherwise. A positive and significant coefficient of Family would indicate that family-owned firms perform better compared to non-family firms. To test the third hypothesis, we estimate the following equation:

$$RISK_{i,t} = \alpha_{i,t} + \beta_1 ESG_{i,t} + \beta_2 Family_{i,t} + \beta_3 ESG * Family_{i,t} + \sum_{i=0}^n \beta Z_{i,t} + e_{i,t} \quad (3)$$

This equation aims to evaluate the moderating effect of family ownership on the relationship between ESG and financial risk.

RESULT AND DISCUSSION

Table 1 presents the distribution of our sample. The percentage of observations from each industry in Indonesia is as follows: Energy (15.58%), Industrials (15.58%), Finance (16.88%), Property (7.79%), Infrastructure (12.99%), Basic Materials (10.39%), Consumer Cyclical (11.69%), Consumer Non-Cyclical (6.49%), and Healthcare (2.60%).

Table 1. Sampel Distribution

Industry	Family Firms	Non-Family Firms	Total	%
Energy	39	33	72	15.58%
Finance	33	45	78	16.88%
Industrials	37	35	72	15.58%
Property	19	17	36	7.79%
Infrastructure	18	42	60	12.99%
Basic Materials	22	26	48	10.39%
Consumer Cyclicals	28	26	54	11.69%
Consumer non-cyclical	15	15	30	6.49%
Healthcare	4	8	12	2.60%
Total Observations	215	247	462	100%

Table 2 Descriptive Statistic

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
DER	84.994	50.815	1233.83	0.000	117.97
DAR	25.126	22.010	144.710	0.000	20.164
ESG	38.900	38.630	68.560	16.850	11.175
FAM	0.465	0.000	1.000	0.000	0.499
ROA	4.537	3.135	46.290	-70.080	8.437
GRW	33.336	34.889	37.713	0.000	4.124
MVAL	34.013	35.651	39.826	0.000	5.634
SIZE	34.429	35.523	39.690	23.898	3.767
Total Observations					462

Table 3 Descriptive Statistic and Univariate Test

Variables	Family sample		Non-Family sample		Difference test	
	Mean	Std. Dev.	Mean	Std. Dev.	T statistic	Sig.
ESG	37.471	114.82	40.144	130.81	-2.592	***
DER	76.914	12.145	92.028	15.066	-1.294	
DAR	24.009	442.12	26.100	375.32	-1.106	
ROA	5.254	45.086	3.912	95.354	1.751	*
MVAL	33.406	44.241	34.541	20.392	-2.114	**
GRW	33.079	20.899	33.560	13.584	-1.234	
SIZE	34.206	15.256	34.624	13.236	-1.186	

Notes: This table displays the simple correlations of variables selected from Indonesia from 2018 to 2023. ***, **, and * indicate significance levels at the 1%, 5%, and 10%, respectively.

Table 2 presents the descriptive statistics for the variables examined in this study, based on a mixed sample of Family and Non-Family firms, covering 462 firm-year observations from 2018 to 2023.

Table 3 presents the descriptive statistics for the variables used in the analysis, categorized by firm type. Non-family firms exhibit higher ESG scores compared to family firms. Structural factors (such as ownership and financing) and cultural elements (such as priorities and

transparency) within family firms may pose challenges to the adoption and disclosure of ESG practices, leading to generally lower ESG scores (Arduino et al., 2024; Espinosa-Méndez et al., 2023; Sritanee & Lonkani, 2023). Concentrated ownership in family firms often makes decision-makers more cautious about risks that could threaten their legacy and control (Miroshnychenko et al., 2025). Additionally, these firms tend to rely on internal cash flows, which are often insufficient to finance large-scale green projects (Espinosa-Méndez et al., 2023);

Green investments, whose benefits are realized in the long term, are frequently overlooked as they do not align with the immediate need for cash distribution (Bang, 2025). Furthermore, the lack of external demands for transparency and accountability in developing countries also contributes to weak incentives for green investment.

However, DER and DAR in family firms are lower compared to non-family

firms. Family firms may exhibit a combination of risk aversion (Comino-Jurado et al., 2021), a preference for internal financing (Hansen & Block, 2021), lower agency costs, and a long-term orientation (Haider et al., 2021), which makes them more cautious in using debt. As a result, their DAR and DER ratios are consistently lower than those of non-family firms.

Table 4 Correlation Matrix

Variables	DAR		DER		ESG		FAM		ROA		MVAL		GRW		SIZE
DAR	1.000														
DER	0.593	***	1.000												
ESG	-0.059		-0.003		1.000										
FAM	-0.052		-0.064		-0.119	**	1.000								
ROA	-0.314	***	-0.189	***	0.059		0.079	*	1.000						
MVAL	-0.262	***	-0.099	**	-0.028		-0.101	**	0.267	***	1.000				
GRW	-0.259	***	-0.152	***	0.019		-0.058		0.186	***	0.699	***	1.000		
SIZE	-0.251	***	-0.124	***	-0.003		-0.055		0.092	**	0.719	***	0.892	***	1.000

Notes: This table displays the simple correlations of variables selected from Indonesia from 2018 to 2023. ***, **, and * indicate significance levels at the 1%, 5%, and 10%, respectively.

Table 4 presents the correlation matrix of all variables used in this study. None of the variables exhibit a high correlation with DER and DAR. The correlation coefficients between financial risk (DER and DAR) and the other variables are all below 0.6, indicating the absence of significant multicollinearity among the variables (Lee, 2006). Consequently, all the variables can be employed to estimate the Equations. Therefore, all variables can be included in the estimation models. Additionally, the correlation coefficients between ESG and financial risk show a negative sign, providing preliminary support for our first hypothesis (H1b). The Family variable also shows no significant association with financial risk, which offers initial support for the second hypothesis (H2b).

The control variables MVAL and SIZE are positively correlated with financial risk,

whereas ROA and GROWTH are negatively correlated. MVAL shows a positive correlation with DAR because, as Tao-Schuchardt et al. (2023) argue, an increase in market value is usually accompanied by asset appreciation, which can serve as collateral for long-term borrowing. This increases the firm's debt capacity, thereby raising the DAR ratio. On the other hand, MVAL is negatively correlated with DER because family firms prioritize socio-emotional wealth (SEW), thus avoiding high leverage that may threaten control and reputation.

Consequently, investors tend to penalize high D/E ratios, leading to lower MVAL (Baixauli-Soler et al., 2021). Moreover, the positive correlation between SIZE and financial risk aligns with the findings of (Bhagat et al., 2015; Chatterjee & Eyigungor, 2023), who suggest that larger firms tend to have higher leverage due to easier access to

credit and more stable growth, though this also increases interest expenses and financial risk.

Furthermore, ROA and GROWTH are negatively correlated with financial risk. Firms with high ROA typically use retained earnings to finance expansion, reducing the need for debt, keeping leverage low, and lowering financial risk (Espinosa-Méndez et al., 2023; Mahmood & Ali Shah, 2015). As for GROWTH, studies by (Mismetti et al., 2024; Ntoug et al., 2019; Stryckova, 2023) find that growth in family firms is usually accompanied by increased cash flow, enhancing liquidity and reducing reliance on debt, thereby decreasing default and liquidity risks.

We conducted panel data regression analysis using a fixed effects model to explore the relationships between ESG and financial risk, family ownership and financial risk, as well as the moderating role of family ownership in the ESG–financial risk relationship. The analysis focuses on financial risk as the dependent variable, measured using DER and DAR. The panel regression results for Equations (1) to (3) are presented in Table 5.

Equation (1) estimates the impact of ESG on financial risk, using DER and DAR as risk indicators. The results show that ESG has a significant negative effect on financial risk, consistent with the first hypothesis (H1a). This negative relationship is observed in both DER and DAR, with significance levels at 1%.

Whelan et al. (2021), through a meta-analysis of over 1,000 studies, find that companies with strong ESG practices tend to exhibit more stable financial performance and lower risk. This finding is supported by Lee and Koh (2024), who, using a sample of U.S. financial sector firms, show that a one-point increase in composite ESG score is significantly associated with lower earnings volatility and credit spreads. This suggests that firms with lower ESG performance are exposed to greater financial risks. In essence, poor ESG performance increases the likelihood of facing regulatory, operational, reputational, climate, and credit risks,

ultimately raising financial risk and the cost of capital.

In Equation (2), we estimate the impact of family ownership on financial risk, using DER and DAR as risk metrics. However, the model does not confirm the prediction of Hypothesis 2. While family firms are generally believed to adopt a long-term investment horizon aimed at ensuring continuity across generations, our results are not statistically significant at any conventional level. Ntoug et al. (2019) report that family firms tend to maintain conservative capital structures and higher liquidity, making them less vulnerable to external shocks compared to non-family firms. The active involvement of family members in management and board positions strengthens internal monitoring mechanisms. As the family's reputation is at stake, such firms often adopt prudent governance practices to prevent opportunistic behavior and inefficiencies (Rodríguez et al., 2021). Therefore, family firms are not necessarily riskier than non-family firms; rather, they often implement better risk management strategies, which can help reduce financial risk.

Moreover, our study does not distinguish between firms that consistently remain family- or non-family-owned throughout the sample period, nor does it focus on firms that changed ownership status. A study by Schmid et al. (2008) finds that family firms exhibit higher levels of risk aversion, leading to more extensive use of hedging instruments to protect cash flows and more selective asset portfolio diversification. Collectively, this evidence suggests no significant difference in financial risk between family and non-family firms.

Finally, our third hypothesis is supported by the results. The analysis shows that family ownership weakens the relationship between ESG and financial risk, both proxies, DAR and DER, yielded coefficients of -1.551 and -0.118, respectively, with significance levels of $p < 0.05$ and $p < 0.10$. These findings imply that the negative influence of ESG on financial risk holds for both family and non-family firms.

According to Espinosa-Méndez et al. (2023) and Zhao and Wang (2024), family firms often face tighter financial constraints due to a reluctance to seek external funding and a strong desire to maintain control. These limitations make it difficult to finance ESG investments without increasing debt, thereby reducing the effectiveness of ESG in mitigating financial risk compared to non-family firms with broader financing options. Empirical studies also find an inverted-U-shaped relationship between ESG and risk-taking in family firms: up to a certain point, increased ESG efforts reduce risk, but beyond a threshold, further ESG investments yield

diminishing returns. At this stage, families may “over-invest” in non-value-adding initiatives (e.g., symbolic CSR programs), weakening ESG’s role in mitigating financial risk (Khaw et al., 2024; Liu & Zhang, 2024). These findings suggest that family-firm characteristics such as financial constraints, a focus on socio-emotional wealth, threshold effects, and limited professionalization can reduce the effectiveness of ESG initiatives in lowering financial risk. As a result, the negative correlation between ESG and financial risk tends to be weaker in family firms compared to non-family firms.

Table 5 The Relationship Between ESG, Family, and Financial Risk

Variables	DER			DAR		
	(1)	(2)	(3)	(1)	(2)	(3)
Constant	-1033.2 (-1.729)	* -940.75 (-1.763)	* -951.92 (-1.589)	-225.86 (-3.268)	*** -112.46 (-1.794)	*** -218.96 (-3.151)
ESG	-0.169 (-0.228)		0.331 (0.414)	-0.303 (-3.519)	***	-0.267 (-2.878)
FAMILY		-1.947 (-0.247)	55.249 (1.944)		0.331 (0.357)	4.114 (1.248)
ESG*FAMILY			-1.551 (-2.113)			-0.118 (-1.390)
ROA	-0.522 (-0.755)	-0.461 (-0.662)	-0.456 (-0.651)	-0.531 (-6.633)	*** -0.488 (-5.971)	*** -0.524 (-6.452)
MVAL	-0.275 (-0.210)	-0.301 (-0.229)	-0.562 (-0.426)	0.600 (3.969)	*** 0.634 (4.101)	*** 0.576 (3.759)
GROWTH	-1.263 (-0.375)	-1.332 (-0.394)	-0.994 (-0.294)	-1.354 (-3.491)	*** -1.338 (-3.371)	*** -1.342 (-3.430)
SIZE	34.235 (1.867)	* 31.467 (1.969)	* 31.360 (1.710)	* 8.425 (3.973)	*** 4.725 (2.516)	*** 8.195 (3.851)
Adjusted R ²	0.611	0.611	0.614	0.824	0.819	0.824
F Statistic	9.940	***	9.941	***	27.701	***
Observations	462	462	462	462	462	462

Notes: : Table 5 presents the results of the fixed effect panel regression from Equation (1) to Equation(3). The dataset comprises a total of 462 observations, encompassing a diverse mix of both Family and Non-Family firms. Family is dummy variable assumes a value of 1 from ownership structure analysis and 0 otherwise. The regression model incorporates several control variables, specifically ROA, MVAL, GROWTH and SIZE. The t-statistics are denoted within parentheses. The symbols ***, **, and * signify the levels of significance at 1%, 5%, and 10%, respectively.

We also conduct a regression test with robust standard errors using the White cross-section method to ensure that the variance of the errors in the regression model is

constant. Table 6 presents the robustness test for the relationship between ESG, family firms, and financial risk. The results indicate that our regression model remains stable.

Table 6 The Robustness test of the Relationship Between ESG, Family, and Financial Risk

Variables	DER						DAR					
	(1)		(2)		(3)		(1)		(2)		(3)	
Constant	-225.55	***	-946.06	*	-958.77	*	-102.40	*	-113.93	*	-220.57	***
	(-5.655)		(-1.774)		(-1.603)		(-1.706)		(-1.819)		(-3.179)	
ESG	-0.308	***			0.326		-0.304	***			-0.268	***
	(-4.591)				(0.408)		(-3.285)				(-2.892)	
FAMILY			-1.920		55.245	**			0.337		4.113	
			(-0.244)		(1.944)				(0.364)		(1.248)	
ESG*FAMILY					-1.550	**					-0.118	
					(-2.112)						(-1.389)	
ROA	-0.526	***	-0.460		-0.456		-0.487	***	-0.488	***	-0.524	***
	(-7.479)		(-0.661)		(-0.652)		(-8.693)		(-5.973)		(-6.457)	
MVAL	-0.274	***	-0.300		-0.562		0.598	***	0.635	***	0.577	***
	(-3.889)		(-0.228)		(-0.425)		(4.248)		(4.106)		(3.764)	
GROWTH	-1.372	***	-1.344		-1.006		-1.366	***	-1.341	***	-1.344	***
	(-3.506)		(-0.398)		(-0.298)		(-0.403)		(-3.376)		(-3.435)	
SIZE	34.445	***	31.631	**	31.575	*	8.426	***	4.769	**	8.244	***
	(3.978)		1.981		(1.723)		(3.863)		(2.542)		(3.879)	
Adjusted R ²	0.612		0.611		0.612		0.610		0.819		0.824	
F Statistic	9.988	***	9.942	***	9.823	***	9.798	***	26.699	***	27.077	***
Observations	462		462		462		462		462		462	

Notes: Table 6 presents the robust standard errors using white cross section of the fixed effect panel regression from Equation (1) to Equation (3). The dataset comprises a total of 462 observations, encompassing a diverse mix of both Family and Non-Family firms. Family is dummy variable assumes a value of 1 from ownership structure in annual report and 0 otherwise. The regression model incorporates several control variables, specifically ROA, MVAL, GROWTH, and SIZE. The t-statistics are denoted within parentheses. The symbols ***, **, and * signify the levels of significance at 1%, 5%, and 10%, respectively.

CONCLUSION

This study investigates the impact of ESG (Environmental, Social, and Governance) practices and family firm characteristics on financial risk in Indonesia,

using DER (Debt-to-Equity Ratio) and DAR (Debt-to-Asset Ratio) as risk metrics. Our analysis yielded several key findings and conclusions.

First, the study reveals that ESG practices have a negative effect on financial risk, thereby supporting hypothesis H1a. This finding is consistent with previous research suggesting that social and governance scores significantly strengthen credit ratings, thereby improving access to capital markets and liquidity; stronger credit ratings reduce the likelihood of a firm experiencing liquidity distress or default (Arduino et al., 2024; Kim & Li, 2021). Furthermore, Peliu (2024)'s study of firms listed on the New York Stock Exchange demonstrates that ESG practices help mitigate debt and liquidity risks, primarily by enhancing asset profitability and diversifying stakeholder relationships. Thus, the integration of ESG not only satisfies regulatory and reputational demands but also concretely strengthens a company's financial foundation by reducing its cost of capital, shielding it from market volatility, and mitigating default risk.

Second, although family firms might be expected to exhibit superior governance and risk management compared to non-family firms, our results did not indicate statistically significant differences. This could be attributed to the fact that family firms frequently prioritize family interests over economic efficiency (Benlemlih & Girerd-Potin, 2017). Moreover, family ownership does not moderate the relationship between ESG factors and financial risk, as the negative effects of ESG factors remain consistent for both family and non-family firms. This finding suggests that the absence of a moderating effect reflects a generally low level of awareness regarding ESG initiatives among both family and non-family firms in Indonesia. High investment costs and uncertainty about future returns further contribute to this condition.

This study's findings yield several practical implications. First, ESG factors have become critical considerations for investors, regulators, and corporate management teams. For business operators, integrating ESG into operational processes is no longer optional but essential

for reducing risk exposure. However, funding ESG programs requires substantial resource commitments particularly for family-owned firms that rely heavily on operating cash flows, so management must carefully assess their available financing capacity. Second, diversifying investment portfolios by allocating capital to companies with strong ESG commitments while accounting for the impact on systematic risk can potentially enhance risk-adjusted returns. This underscores that ESG practices cannot be separated from an effective risk-management framework. Third, embedding ESG considerations into strategic planning strengthens a company's stability and resilience, especially during crises such as the COVID-19 pandemic when market volatility spikes. Finally, tailoring ESG strategies to a firm's size and industry characteristics is a strategic imperative to fully optimize the risk-mitigation and resilience-building benefits of ESG initiatives.

Lastly, the study acknowledges several limitations. The inclusion of ESG scores during the pandemic period may have contributed to the observed negative effects of the examined variables. Future research should consider utilizing post-pandemic ESG datasets, during which green investments have become a focal point and many companies have begun to adopt these practices. Additionally, further studies are necessary to explore the long-term impact of ESG practices on financial risk across various sectors and countries.

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