Trend Analysis of the Impact of ESG Practices on Corporate Risk Management and Financial Stability: Evidence from Developed and Developing Economies

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ABSTRACT

The research evaluates Environmental Social and Governance (ESG) practice impacts on corporate risk management and financial stability through debt risk and liquidity risk and on total financial outcomes across developed and developing economic areas. The researchers conducted panel regression analysis throughout ten years (2012–2022) using data from 49 countries and 34,953 firm observations to study the relationship between ESG adoption and firm sustainability. This research integrates Eikon's ASSET4 ESG scores alongside financial performance metrics that include Tobin's Q which incorporates the year's sector and country fixed effects. Research evidence demonstrates that executed ESG practices lead to superior financial results and stability, especially among developed economies where environmental along social practice integrations show the strongest impact. CEO duality and gender diversity serve as ESG factors that shape debt and liquidity risk patterns, and these conditions have worsened corporate financial stability according to the research. The implementation of ESG criteria in risk management strategies proves vital because it strengthens both financial sustainability and stability long-term therefore offering key insights to various stakeholders. Firms that grasp ESG's role in risk management and financial well-being attainment will obtain improved financial results that support global sustainability goals.

Key Words: ESG practices, Corporate Risk Management, financial stability, developed countries, developing economies.

INTRODUCTION

A company's performance and practices in these three essential domains environmental, social, and governance are disclosed in what is known as ESG reporting. Stakeholders may use the many non-financial metrics included to assess a company's governance structures, sustainability initiatives, and ethical impact (Chairani & Siregar, 2021). More openness and accountability in corporate social responsibility are sought after by investors, consumers, and regulatory organizations, leading to the rise of ESG reporting. Many factors have contributed to ESG reporting's growing importance. Companies with strong ESG procedures usually have better financial results and lower risk profiles, which is something that stakeholders are starting to notice more and more. Sustainable equities funds outperformed conventional funds even while the market was down, according to Li (2024), proving that ethical business practices pay off financially. Nzir et al. (2024) note that companies are obligated to report on their ESG-related activities and adopt more sustainable practices due to legislative requirements and international agreements like the Paris Agreement. Aligning corporate operations with the values of socially conscious consumers, ESG reporting strengthens a company's image and strengthens brand loyalty (Gupta & Chaudhary, 2023). ESG reporting is a strategic need that may promote long-term value creation and competitive advantage in today's business climate; it also acts as a transparency tool.

Figure 1 ESG Reporting Stages (Aydoğmuş et al., 2022).

Unpredictable potential negative events fall under the definition of risks because they create prospects of destruction and goals unrealisable while damaging financial stability especially when external aspects like governance, political, technological, social, and environmental factors emerge. In his analysis, Le (2024) establishes that external organizational influences have a strong positive link with risk management as well as a direct connection between legal and regulatory factors and risk management practices. The study conducted by Xu & Zhu (2024) explores how corporate governance affects social sustainability and debt risk to determine how social sustainability controls risk and serves as a mediator. Several types of risks develop because of different internal and external components. All operational risks and IT risks as well as financial, political, security, technical, industrial, climatic, liquidity, strategic and market risks and operational risks belong to different categories of potential hazards. The research conducted by Li et al. (2024) traces the relationship between financial insolvency and liquidity risk which operates on corporate insolvency risk while using 911 firms listed on Chinese A-share markets from 2009-2019.

Risk management is critically significant. Risk identification follows risk mitigation and assessment which enables continuous monitoring until possible damage reduction as much as possible. The research by Fu & Li (2023) shows that organizations must reveal risks which could affect their future expansion while demonstrating the need for successful risk management practices to resolve these threats. The research by Chairani & Siregar (2021) shows that enterprise risk management leads to advanced risk recognition and evaluation and correct solution creation which strengthens corporate risk management performance.

Sales along with profit margins together with return on equity (ROE) and profits before interest and taxes (EBIT) served as traditional methods for examination of corporate financial steadiness (Ng et al., 2020). These financial indicators offer a concise overview of a company's profitability and operational efficiency, especially emphasizing short-term results and shareholder value. As the business environment develops, there is an increasing acknowledgement of the significance of ESG measures in evaluating a company's long-term sustainability and overall success. ESG measures assess a company's dedication to sustainability, ethical conduct, and stakeholder involvement (Ni & Huang, 2023). The four main areas of research include board governance structures together labour practices diversity and inclusion and waste management as well as carbon emissions. Numerous studies show that companies implementing robust ESG practices achieve superior results than their competitors produce over an extended period. Ni & Huang (2023) established that sustainable performance excellence leads organizations to attain better operational results and maintain stable stock prices. While traditional financial metrics show short-term performance indicators ESG measurements show business risk reduction capabilities and opportunity leveraging potential that results in better long-term sustainable growth (Fu & Li, 2023). Organizations pursuing success in a competitive environment need to integrate ESG factors into financial performance evaluations since stakeholders put more focus on long-term value.

This research sought to study the impact which Environmental Social Governance (ESG) policies impose on business risk management alongside financial stability within established economies and developing countries. The research evaluates ESG implementation effects on enterprise risk reduction and financial stability through economic condition analysis by examining historical trends. The study acquires empirical evidence regarding the role of ESG implementation in risk management strategies and sustainable financial outcomes. The analysis explores how regulatory structures together with market sophistication in addition to investor expectations

determine the financial performance association between ESG practices among established and emerging economies.

The research establishes the impact between selected risk indicators and multiple elements related to corporate governance environmental influences and business performance. The study seeks to examine the influence of ESG elements on company risk in both developed and emerging economies, offering empirical data to substantiate this link. This was accomplished by data analysis and evaluation of corporate performance, to understand how ESG elements might affect risk levels and market success of these firms. The study assesses the correlation between ESG factors and corporate risks to elucidate their mutual influence, identify mechanisms by which these factors affect corporate risk, examine the impact of ESG factors on companies' financial performance, and identify gaps and challenges related to ESG factors, their transparency, and reporting methodologies. It seeks to validate assumptions concerning the influence of ESG elements and concludes that companies with strong ESG performance exhibit reduced risk levels.

The research expands knowledge about ESG and business sustainability from multiple perspectives. This research extends Fu & Li (2023) by evaluating how proactive ESG policies affect corporate financial performance through analysis of contemporary worldwide organizational data. The study investigates individual ESG practices as well as the total ESG activity effects while differing from the approach used by Xu & Zhu (2024). Extensive environmental social and governance procedures identify superior financial sustainability for companies. This investigation adds value to the ESG literature through its analysis of ESG practice effects on financial performance comparison between developed countries and developing economies. ESG policies benefit businesses better in developed economies according to the research results. It is found in this study that strong ESG practices generate financial stability, and the economic standing of a country influences the development of corporate ESG programs.

Empirical evidence indicates that ESG features present positive relationships that reduce organizational risks and produce various implications for stakeholders. Businesses implementing sustainable and socially responsible approaches decrease their financial as well as reputational and regulatory exposure (Ng et al., 2020). The research findings create a substantial impact on various stakeholders, particularly investors who utilize ESG criteria to make investment choices alongside consumers and communities who benefit from business social and environmental participation employment creation environmental protection and local area backing (Nazir et al., 2024). The research established a model and assessment method to measure independent variable impacts on risk assessment while exploring internal risk factors as well as particular external elements.

LITERATURE REVIEW

Existing ESG practices

According to Le (2024), ESG reporting has undergone major transformations throughout the past forty decades. The rising stakeholder demand for corporate social responsibility assessments led to the momentum of corporate social responsibility (CSR) during the 1960s and 1970s. The 1987 Brundtland Report through "Our Common Future" elevated sustainability to corporate importance after it defined business responsibility as satisfying current demands without constraining future generation sustainability needs. According to Shanghani et al., (2024), three main factors determine both the acceptance and importance of ESG reporting: regulatory pressure combined with investor preference and stakeholder expectations. Governments together with regulatory bodies are making ESG disclosures mandatory because they want companies to become more open and accountable to stakeholders. Users of financial capital are now focusing more on ESG components during investment selection because ESG performance directly affects business risk exposure and future financial outcomes (Chairani & Siregar, 2021). Customers, joined by workers and community members, expect companies to maintain their environmental and social responsibilities because there is now a greater emphasis on sustainability.

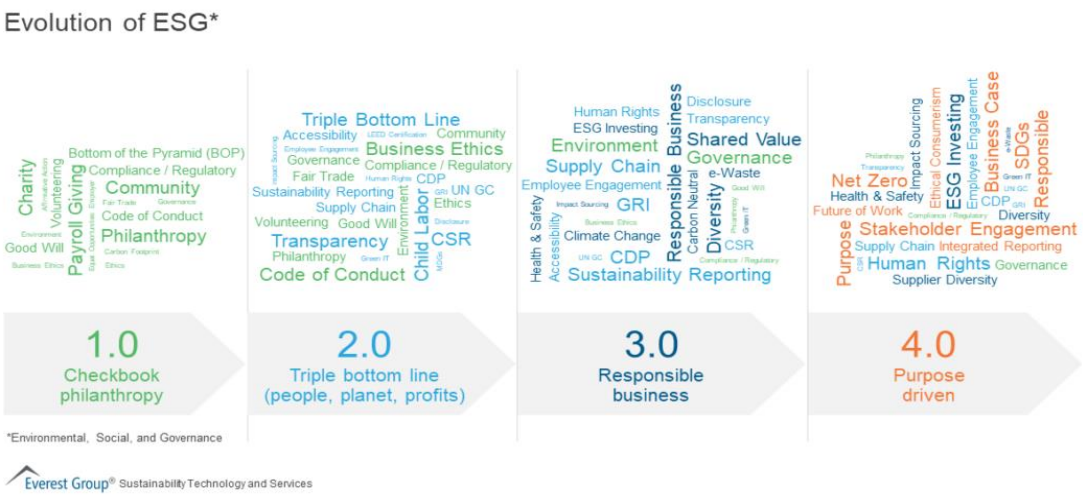

Figure 2 Evolution of ESG (Aydoğmus et al., 2022).

Several ESG reporting frameworks exist to provide standardized directions for sustainability reporting by enterprises. The 1997 Global Reporting Initiative (GRI) standards 1997 provide complete guidance for organizations that wish to report their social environmental and economic outcomes (Ni & Huang, 2023). The Sustainability Accounting Standards Board (SASB) focuses on sustainability information that matters to shareholders to make financial data more accessible in markets (Subhani et al., 2025). Firms use environmental reporting to disclose their approaches for reducing environmental impacts through their operations as a main element of ESG disclosures. Climate hazards resource efficiency carbon emissions and waste management constitute essential points for analysis. Emerging companies are developing tracking and reduction programs that minimize carbon emissions because these emissions significantly contribute to global warming (Gupta & Chaudhary, 2023). Restoring the environment depends on proper waste management even though optimizing resource use focuses on maximizing existing assets. Climate risks that comprise physical hazards and transitional challenges should be evaluated for both long-term sustainability and strategic planning.

Businesses must disclose details about their social activities which include diversity practices while providing labour standards along with community engagement and corporate social responsibility reports. Enhancing profits together with value creation depends on firms publishing their diversity statistics. The fair treatment of employees consists of multiple elements that include their workplace conditions as well as their rights and compensation structure (Kim & Li, 2023). The topics of sustainability efforts along with ethical sourcing and corporate societal impact form the core elements of CSR reports while community impact describes corporate support for communities where operations occur (Ng et al., 2020). Customer brand loyalty and trust tend to grow because CSR initiatives are communicated well which results in continued business success.

Xu & Zhu (2024) demonstrated how governance reporting stands out as the key disclosure area within ESG operations because it presents business management information. The coverage area consists of board definition alongside executive pay levels along with shareholder rights parameters and transparency requirements for upholding ethical practices and accountability throughout companies. Executive remuneration shows how businesses use financial rewards to connect performance outcomes while board structure provides information about the director board organization and operations (Cinciulescu, 2024). Executive long-term success goals should replace fast profits because this outcome requires explicit and transparent compensation plans. The right of shareholders to participate in business decisions forms a key part of their rights and transparent governance reports assure investors while enabling monitorable actions from managers. Organizations that make their practices more open will develop ethical cultures that minimize governance uncertainties. A sustainable culture needs to be developed through objective-setting processes which include incorporating ESG indicators into decisions to integrate ESG practices into business strategies (Li, 2024). Organizations that embrace a complete perspective will tackle major problems to deliver advantages for all their stakeholders.

ESG and corporate risk management

To comprehend how ESG variables affect a business's risk and performance, it is essential to know how these factors affect corporate risks (Prakoso & Apriliani, 2024). To maximize profits, good corporate governance ensures that the company is well-led and -controlled. To promote ethical and sustainable business practices, this study seeks to establish a connection between ESG methods and financial outcomes for companies. Cinciulescu (2024) has investigated the link between ESG variables and business risk by looking at how environmental, social, and governance policies affect a company's capacity to succeed or fail. The effects of noncompliance with corporate governance systems on risk-taking are shown by Li et al. (2024), who also highlight the significance of ESG. Shanghani et al., (2024) use the beneficial impacts of corporate governance on risk reduction and performance enhancement to investigate the relationship between management capacity, CSR, and the risk of default of the firm.

The leadership and control of a firm are mostly dependent on the CEO, who must make ethical judgments that promote social sustainability. Chebbri (2024) argues that a higher ESG rating helps achieve greater performance and minimizes default risk by discussing the consequences of environmental, social, and governance policies on risks. From a corporate governance standpoint, Gupta & Chaudhary (2023) analyze how ESG variables affect environmental features, including how risk-taking affects company performance in the face of excessive heat and pollution. Investing in sustainable technology and practices is one way an enlightened CEO may implement initiatives to limit the negative impact on the environment and the risks connected with it. Kim & Li (2023) investigate the relationship between CEO risk choices and the market value of their companies. Firms run by risk-averse CEOs tend to have more derivative instrument coverage, which in turn generates more value and improves company performance, according to their analysis of the correlation between the two variables. According to Vives & Wadhwa (2012), companies that have two chief executive officers tend to be more profitable, have less earnings fluctuation, and a reduced probability of bankruptcy.

Corporate risk-taking and operational risk in developing nations are negatively impacted by gender diversity on boards of directors, according to studies. Having said that, it has a beneficial effect on business output as well. To effectively manage accident risk and knowledge asymmetry, as well as to make better decisions, gender diversity is essential (Subhani et al., 2025). Because they have a larger motivation to improve risk management, female directors are more inclined to lower risk. Gender equality on corporate boards is supported by Spain, the first European nation to pass a statute to that effect. The key premise is that companies with more gender diversity perform better and have less risk (Rehman et al., 2021). This is because females are more likely to consider the consequences of their actions and act empathetically. A company's liquidity and debt levels are positively affected by gender diversity.

Strong ESG performance, as Chebbri (2024) has demonstrated, may lower risk and boost performance. Concerns about ESG performance and sustainable development capabilities are substantial under the double carbon framework. Furthermore, research has shown that there is a bidirectional causal relationship between ESG factor exposure and market valuation, specifically about reputational risk. Research by Prakoso & Apriliani (2024) on the impacts of enterprise risk management (ERM) on both performance and financial stability has shown conflicting results. Internal monitoring, cost optimization, and financial analysis are necessary for maximizing performance. Internal monitoring evaluates ESG risks and implements sustainable policies and practices; these two aspects work hand in hand with ESG considerations.

ESG's impact on financial stability

Proactively investing in ESG activities and meeting the aspirations and requirements of all stakeholders (Gupta & Chaudhary, 2023) should lead to improved financial results for enterprises, according to stakeholder theory. According to Chebbri (2024), companies that prioritize ESG and sustainability-related initiatives may satisfy stakeholders' needs for long-term growth while also gaining an edge in the market and making money. As a result, according to stakeholder theory, ESG practices are positively correlated with financial success. Higher ESG rankings are favourably correlated with financial success (Cinciulescu, 2024). Environmental measures in Australia promote sustainability and decrease financial risks, according to Singhania & Saini (2023) analysis of specific ESG factors. In addition, Li (2024) stated that the best way to boost operational performance in

Kazakhstan is to implement good internal governance standards. In a similar vein, Subhani et al. (2025) found that businesses in Hong Kong reap economic benefits from improved corporate social performance. The above reasoning leads one to believe that companies whose ESG policies, both individually and collectively, are more robust will also have stronger financial results. This leads to the following hypotheses:

H1a: Environmental practices of ESG improve financial performance.

H1b: Social practices of ESG improve financial performance.

H1c: Governance practices of ESG improve financial performance.

H1d: Composite ESG practices improve financial performance.

Vives & Wadhwa (2012) show how a country's economic progress affects a company's ESG policies and bottom line. Put simply, when comparing the correlations between economic circumstances, business practices, and organizational performance outcomes as a function of country-level regulatory regimes, industrialized and developing nations show striking differences (Kim & Li, 2023). Given the differences between developing and emerging markets in terms of firm-level ESG practices, sustainability-related initiatives, and performance outcomes (Cagli et al., 2023), it stands to reason that the impact of these factors on financial performance will also vary between developed and developing nations. Consequently, the research hypothesizes as follows:

H2a: Environmental practices' effects on financial stability vary from developed to developing economies.

H2b: Social practices' effects on financial stability vary from developed to developing economies.

H2c: Governance practices' effects on financial stability vary from developed to developing economies.

H2d: Composite ESG practices' effects on financial stability vary from developed to developing economies.

Theoretical background

Stakeholders theory and legitimacy theory as the underpinning theory

The Freeman 1984 Stakeholder Theory proposes that thriving businesses can match the viewpoints of all the parties involved, making them economically viable. They prioritise not only the owner's wealth maximisation agenda but also the necessities of the company and other parties involved. The Business Roundtable, a consortium of CEOs from prominent businesses in the United States, disclosed they strongly support the stakeholder model and that the corporation's intent ought to satisfy various parties alongside owners, including consumers, staff, neighbourhoods, ecosystems, and vendors. As an evolving corporate framework that reflects the organisation's goals, ESG indicators could evaluate performances and stances on a variety of themes essential to the organisation's broader community of those involved, similar to how accounting metrics analyse the performance of an organisation for owners (Aydoğmus et al., 2022).

According to legitimacy theory, organisations seek validity by complying with societal norms and expectations. Management Decision 3183 highlights the company's compliance with societal principles and expectations. A corporation and its community share a societal contract as well as ethical duties (Mobus, 2005). This social pact specifies the operational connection between an organisation and its immediate environment; provided the organisation meets social needs, the terms of this social agreement might be stated or implied (Koseoglu et al., 2024). Stated conditions are statutory requirements mandated by law and legislative authority, whereas implied conditions include society anticipations, such as social and environmental challenges (Khan, 2022). Companies may aim to adhere to society's requirements by undertaking environmentally friendly activity, such as lowering greenhouse gas emissions (Fernando and Lawrence, 2014). Scores related to ESG examine an organisation's achievements on fronts, and shareholders and other interested parties are increasingly employing ESG to evaluate the company's sustainability and ethical conduct. More High scores in ESG are linked to improved sustainability and fewer greenhouse gas emissions (Alandejani and Al-Shaer, 2023).

Gaps in the literature

Research about ESG practices expands daily though scholars still lack precise knowledge about their effects on corporate risk mitigation and financial health within developed and developing countries worldwide. Vives & Wadhwa (2012) research studies ESG as a determiner of firm performance investor preferences and regulatory compliance but fails to explore intricate methods through which ESG affects corporate resilience during financial and operational risks. Underdeveloped corporate structures in developing economies along with underdeveloped financial markets face inconsistent regulation that needs further study of the ESG-risk management relationship. The analysis of how ESG influences corporate risks by Rehman et al. (2021) depends on overall market indices and statistical group decisions without understanding the unique characteristics of different market settings and sector-specific mechanisms that impact risk mitigation through ESG intervention.

Research stemming from the literature is inadequate regarding ESG's effect on financial stability. Most available research evaluates how strong ESG commitments drive lower volatility and better credit ratings and capital access for firms however minimal literature exists to prove the long-term financial stability of companies. This research unifies this scholarly void by executing a thorough economic period examination of how ESG methods influence corporate risk reduction alongside financial sustainability specifically in developed and emerging markets.

METHODOLOGY

The research adopts mixed methods to analyse ESG's impact on financial stability and risk management through qualitative and quantitative source analysis. The research methodology consists of examining two main research questions.

Qualitative Research

A qualitative research design using available secondary materials addressed RQ1 by investigating ESG practice impacts on corporate risk management through various economic settings. Researchers gathered qualitative data by conducting an organized review of industry reports in combination with academic literature and corporate sustainability reports policy documents and regulatory guidelines. The materials provided knowledge regarding governance systems ESG risk mitigation methods and standardized social responsibility practices that organizations should follow in different sectors (Shanghani et al., 2024). Secondary sources needed to be published recently and written by expert reviewers or industry specialists while demonstrating a link between corporate strategy and ESG risk management systems. The study eliminated all sources which did not contain statistical evidence while retaining those presenting old information that differentiated between economies at different stages of development and produced results with reliability.

The qualitative portion of the research analysed 50 secondary materials consisting of 30 peer-reviewed journal articles as well as 10 reports from financial institutions and regulatory bodies such as the World Economic Forum and International Sustainability Standards Board among others. Various economic sectors revealed 10 sustainability disclosure reports from different businesses. The analysis procedure based on thematic analysis extracted core themes that included risk and regulatory compliance and ESG integration strategies and crisis response plans from the analysed documents (Landi et al., 2022). The researcher conducted content analysis which enabled structured categorization of patterns in corporate risk management strategies affected by ESG elements. Multiple resource integration in this approach produced a deep knowledge of how ESG factors shape corporate risk management practice within specific contexts.

Quantitative Analysis Using Statistical Methods

Statistical methods within a quantitative research design were used to evaluate how ESG adoption affects corporate financial stability in an assessment of the RQ2. Both developed and developing economy firms were included in panel data analysis which merged financial and ESG performance data. The set of data comprised ROA, ROE, and EPS financial indicators with debt-to-equity ratio measurements together with ESG evaluations from rating agencies MSCI ESG Ratings, Sustainalytics, and the Refinitiv ESG Database. A total of 500 publicly

available companies served as the study sample while maintaining an equal number of developed and developing economy organizations for comparative examination purposes.

Sample and data

The research uses Eikon's ASSET4 market data and ESG data to look at every publicly traded company in the world. While financial metrics were sourced from DataStream and World scope, data on ESG practices were received from ASSET4. In the end, 34,953 firm-years from 49 countries spanning 2002–2022, after excluding businesses with missing data on the main and control variables, make up the sample. Table 1 displays the sample breakdown by country. Highly developed countries are represented by the United States (19.29%), Japan (13.73%), and the United Kingdom (10.47%), while emerging markets like Kazakhstan (0.05%) and Papua New Guinea (0.04%) are underrepresented.

Research Variables

Using Tobin's Q (TOBIN), we may measure a firm's financial performance, which serves as the dependent variable. In line with previous research (Cagli et al., 2023), TOBIN is calculated by dividing total assets by market capitalization plus total liabilities. Stakeholders' views of a company's sustainability efforts and results are more accurately reflected by this metric. In most cases, a higher TOBIN number indicates that the firm is doing well financially.

The ESG practices function as research variables. The analysis of ESGs GOVs SOCs and ESGs in this paper uses the same method as Kilick et al. (2024) through ASSET4. The calculation of ESGs depends on environmental activities related to green innovation together with emission reduction and natural resource optimization. Community services human rights protection and workforce effectiveness alongside product responsibility integration are the social information and activities used to create SOGs as weighted average ratings. The components of internal governance that form the GOV weighted average rating include governance by management together with shareholder treatment and corporate social responsibility activities. The indicators of this pillar include ENVs SOCs and GOVs that combine to establish ESGs. The scoring spectrum for ESG criteria ranges from complete to total implementation with values between zero and one hundred.

This research contains control variables following Aydoğmuş et al. (2022) that determine monetary performance. The study incorporates four sets of internal governance variables which include liquidity, slack, capital intensity, leverage, profitability and firm size. The definitions along with evaluation standards of these factors are provided in Appendix 1.

Model Specifications

This research uses the following model to examine how ESG policies affect bottom-line results:

$$TOBIN_{it}=\alpha_0+\alpha_1 ESG_{it}+\sum Controls_{it}+\sum Fixed\ Eff\ ects+\varepsilon$$

Where:

TOBIN = financial performance, measured as Tobin’s Q.

ESG = individual (ENVscore, SOCscore, and GOVscore) and the overall ESG (ESGscore) practices.

The model incorporates fixed effects for year, sector, and country to account for potential variations across different years, industries, and markets. All other variables are delineated in Appendix 1. To examine whether the impact of ESG practices on financial sustainability varies between developed and developing economies, the study employs the following model:

$$TOBIN_{it}=\alpha_0+\alpha_1 ESG_{it}+\alpha_2 ESG*DEVEL_{it}+\alpha_3 DEVEL_{it}+\sum Controls+\sum Fixed\ Eff\ ects+\varepsilon$$

Where:

DEVEL = indicator if firm-years belong to developed countries, and zero otherwise.

ESG*DEVEL = the interaction term between ESG practices and DEVEL.

Reliability and Validity

For data verification purposes the research included organizations that presented both steady ESG data measurement and financial documentation spanning five years. Data collection resulted in the exclusion of companies lacking complete data firms with inconsistent ESG reporting and those in heavily regulated sectors except government-controlled enterprises to minimize analysis distortion. The study conducted linear regression analysis paired with correlation tests by serving ESG adoption as the independent variable while financial stability metrics stood as dependent variables. The research used fixed-effects and random-effects models alongside specific firm and economic variable controls to enhance result robustness. To evaluate economic downturn impacts ESG-integrated firms faced stress-testing analysis was incorporated into the study.

EMPIRICAL RESULTS

ESG and corporate risk management

An experimental analysis studied factors influencing factors through a sample of 49 nations. Figure 3 shows the statistical description of all variables used during the empirical analysis of this study. The available financial flow holds the top value position while demonstrating the lowest values indicating receipts level inferiority to expenditures level. The lowest measured value stands at 0.074 regarding the return on assets (ROA) variable. The research includes 520 through 650 observations. The graphical illustration showing variable relationships appears in Figure 3. The existence of strong variable relationships requires correlation coefficients to exceed 0.5. Some pairs of variables demonstrate tenuous connections in their relationships.

The majority of the variables exhibit values below the threshold of 0.5, suggesting the existence of weak correlations; consequently, the likelihood of multi-collinearity posing an issue is diminished. There a significant correlations among various financial metrics: a correlation of 0.652 between return on invested capital and return on equity; a correlation of 0.953 between return on assets and return on equity; a correlation of 0.660 between the reinvestment rate and return on equity; a correlation of 0.854 between the current liquidity ratio and the quick liquidity ratio; a correlation of 0.862 between the general debt ratio and leverage; a correlation of 0.614 between the presence of non-executive board members and independent board members; and, finally, a correlation of 0.835 between total energy consumption and total CO2 emissions.

ESG's impact and financial stability

Table 1 presents the descriptive statistics. The mean value of TOBIN is 1.66, with a standard deviation of 1.03, and it exhibits a range from 0.62 to 6.57. The mean values of the ENVs, SOCs, GOVs, and ESGs are 49.79%, 51.60%, 55.01%, and 52.07%, respectively. The statistics about the control variables align with findings from previous studies (Aydoğmuş et al., 2022). Moreover, Table 2 delineates the correlation coefficients. As anticipated, SOCs, GOVs, and ESGs exhibit a positive correlation with TOBIN. Conversely, ENVs exhibit a negative correlation with TOBIN. Nevertheless, the complex relationships between ESG and TOBIN cannot be explained by univariate correlation analysis (Saygili et al., 2022). Consequently, it is imperative to employ multivariate analysis, which considers the confounding influences of various factors as well as the disparities across different years, sectors, and markets. The coefficients among the independent variables are below 0.70, signifying the absence of threats posed by multi-collinearity (Li et al., 2024). The substantial correlation of 0.90 between SOCs and ESGs does not present concern, as these explanatory variables are not incorporated within the same regression analysis.

Table 1 – Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max

TOBIN	34953	1.70	1.03	0.60	6.60
ENVs	34953	49.80	26.31	0.00	94.50
SOCs	34953	51.60	23.70	3.90	94.34
GOVs	34953	55.01	21.70	8.80	93.80
ESGs	34953	52.07	19.60	9.22	88.80
FPRFT	34953	6.70	8.15	-21.60	33.26
FSIZE	34953	15.76	1.40	12.70	19.08
SLACK	34953	0.12	0.10	0.00	0.51
CPLIN	34953	0.36	0.23	0.01	0.90
LIQDT	34953	1.60	0.99	0.40	6.14
DEBT	34953	0.60	0.19	0.13	1.00

Table 2 – Pairwise correlations

Variables											
TOBIN	1.00										
ENVs	-0.06	1.00									
SOCs	0.05	0.70	1.00								
GOVs	0.00	0.31	0.40	1.00							
ESGs	0.00	0.87	0.90	0.60	1.00						
FPRFT	0.60	-0.04	0.02	-0.01	-0.01	1.00					
FSIZE	-0.24	0.40	0.33	0.21	0.40	-0.11	1.00				
SLACK	0.22	-0.04	-0.04	-0.04	-0.04	0.17	-0.16	1.00			
CPLIN	-0.15	-0.03	-0.07	0.01	-0.05	-0.13	0.07	-0.32	1.00		
LIQDT	0.15	-0.10	-0.10	-0.05	-0.10	0.17	-0.26	0.50	-0.20	1.00	
DEBT	-0.09	0.11	0.13	0.05	0.13	-0.26	0.25	-0.24	0.00	-0.60	1.00

Table 3 displays the outcomes of the TOBIN regression concerning the ESG factors. Global enterprises operating in various nations may significantly enhance their financial outcomes by being proactive and increasing individual aspects of ESG, as indicated by the positively significant coefficients of SOCs, ENVs, and GOVs. Also, the ESG index has a positive and statistically significant coefficient, thus we know that combining ESG practices improves financial results. This provides support for hypotheses H1a, H1b, H1c, and H1d. Firms with superior environmental, social, governance, and composite ESG policies tend to have better performance

outcomes, which is consistent with previous studies (Cagli et al., 2023). Companies that prioritize ESG standards also tend to be financially sustainable, according to Table 3. This finding lends credence to stakeholder theory.

Table 3 – Effects of ESG practices on financial performance

	TOBIN	TOBIN	TOBIN	TOBIN
ENVs	0.002			
	(0.000)			
SOCs		0.004		
		(0.000)		
GOVs			0.001	
			(0.000)	
ESGs				0.004
				(0.000)
FPRFT	0.062	0.062	0.063	0.062
	(0.001)	(0.001)	(0.001)	(0.001)
FSIZE	-0.170	-0.180	-0.160	-0.180
	(0.005)	(0.004)	(0.004)	(0.005)
SLACK	1.291	1.283	1.299	1.284
	(0.075)	(0.075)	(0.075)	(0.075)
CPLIN	0.083	0.070	0.086	0.089
	(0.021)	(0.021)	(0.021)	(0.021)
LIQDT	-0.007	-0.005	-0.007	-0.005
	(0.007)	(0.007)	(0.007)	(0.007)
DEBT	0.570	0.580	0.580	0.574
	(0.035)	(0.035)	(0.035)	(0.035)
Constant	3.358	3.444	3.025	3.482
	(0.090)	(0.090)	(0.082)	(0.090)
Year FE	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes

Observations	34953	34953	34953	34953
Adj. R-squared	0.470	0.472	0.470	0.472

Results from a regression of TOBIN on the interactions between the ESG and DEVEL variables are presented in Table 4. Environmental and social practices seem to have a bigger beneficial effect on financial performance in industrialized nations, according to the positively significant coefficients of ENVindex*DEVEL and SOCindex*DEVEL. These findings support Hypotheses 2a and 2b, which postulate that companies in rich nations and developing economies have distinct impacts of environmental and social practices on financial performance. It appears that governance standards have a favourable effect on financial performance in both established and developing markets since the coefficient of GOVindex*DEVEL is not significant. As a result, H2C is not recommended. The data presented here indicates that good corporate governance is crucial for ensuring long-term financial viability in any market, regardless of the level of economic growth in the country (Le, 2024). There is a positive and statistically significant correlation for ESGindex*DEVEL as well. The results show that in developed economies, a more comprehensive version of ESG practices has a higher impact on financial outcomes, which is in agreement with H2d. Table 4 shows that national economic development is a key component in fostering ESG practices, bolstering sustainability efforts, and producing business sustainability.

Table 4 – Effects of ESG practices in developed and developing economies

	TOBIN	TOBIN	TOBIN	TOBIN
ENVs	0.002			
	(0.0)			
ENVs*DEVEL	0.003			
	(0.001)			
SOCs		0.004		
		(0.0)		
SOCs*DEVEL		0.004		
		(0.001)		
GOVs			0.001	
			(0.000)	
GOVs*DEVEL			-0.000	
			(0.001)	
ESGs				0.004
				(0.000)
ESGs*DEVEL				0.004
				(0.001)

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DEVEL	0.307	0.301	0.299	0.28
	(0.067)	(0.067)	(0.066)	(0.067)
FPRFT	0.062	0.062	0.063	0.062
	(0.001)	(0.001)	(0.001)	(0.001)
FSIZE	-0.176	-0.182	-0.157	-0.185
	(0.005)	(0.004)	(0.004)	(0.005)
SLACK	1.293	1.282	1.298	1.285
	(0.075)	(0.075)	(0.075)	(0.075)
CPLIN	0.080	0.089	0.086	0.089
	(0.021)	(0.021)	(0.021)	(0.021)
LIQDT	-0.007	-0.005	-0.007	-0.005
	(0.007)	(0.007)	(0.007)	(0.007)
DEBT	0.570	0.579	0.577	0.577
	(0.035)	(0.035)	(0.035)	(0.035)
Constant	3.350	3.460	2.980	3.490
	(0.088)	(0.089)	(0.081)	(0.090)
Year FE	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	34953	34953	34953	34953
Adj. R-squared	0.470	0.473	0.469	0.470

Additionally, the study utilizes a different component of firm performance, ALT, which is assessed using Altman's score (Agbakwuru et al., 2020), going beyond what is already published in the literature. This score is calculated using the following formula:

(3) ALT=1.2 (Working capital/Total assets) + 1.4(Retained profits/Total assets) + 3.3 (Earnings before interest and taxation/Total assets) + 0.6 (Market capitalization/Total liabilities) + 0.99 (Sales/Total assets)

To determine how ESG practices affect financial stability and sustainability, there is a need to utilize Altman's score. Panel A of Appendix 2 displays the results, which indicate that the ESG variables have positive and statistically significant coefficients. These coefficients imply that companies that score higher in ESG are more financially stable. Panel B provides additional evidence that companies based in developed nations are more likely to benefit from ESG practices that enhance financial stability. As a whole, Appendix 2's findings corroborate Tables 3 and 4, indicating that stronger ESG practices result in improved financial sustainability.

These benefits are more noticeable for industrialized nations, which emphasizes the significance of economic growth.

DISCUSSION AND CONCLUSION

Impact of ESG Practices on Corporate Risk Management

The risk management indicators become clearer through the descriptive statistics shown in Figure 3. The available cash flow measurements show that receipt amounts stay below expense totals thus indicating probable liquidity challenges. The calculated ROA mean displays the smallest value of 0.074017 among all examined variables which indicates that the sampled firms have relatively low profitability levels. The data in Table 3 presents weak correlations between variables since most coefficients remain under 0.5 which decreases the risk of multi-collinearity. The strong correlation (0.652101) between return on invested capital and return on equity is justifiable because these measures represent profitability indicators. Furthermore, the relationship between the general debt ratio and leverage (0.86251) highlights the significant impact of financial leverage on a firm's debt structure. A high value of 0.834692 links total energy consumption to total CO2 emissions within corporate activities thus highlighting the environmental impact of business operations (Agbakwuru et al., 2020). Lower financial results occur among companies that maintain elevated debt levels while organizations using extensive amounts of energy seem likely to produce meaningful amounts of carbon emissions.

Both general indebtedness and financial performance show their influencing factors through the analysis of fixed and random effects models contained in the regression results. The Hausman test results justify fixed effects when the calculated probability reaches under 5% yet random effects should be used for cases exceeding this value to ensure methodological accuracy. The research findings demonstrate that enhanced empresa debt reduces organizational profitability while reducing financial operational freedom (Singhania & Saini, 2023). The financial elements of leverage and liquidity maintain direct connections with risk management because executive dual leadership and board diversity significantly affect these elements. The independent variables explain only 4% of general indebtedness variations per the coefficient of determination (R-sq overall). The results suggest external factors and the omission of variables could support these findings. The research confirms expected risks related to leverage performance deterioration while introducing new evidence regarding governance mechanisms under pandemic conditions (Landi et al., 2024). Specific regression model variable significance tests demonstrate that financial decision-making behaves because of conditions which shape choices for managers investors and policymakers. Prudent risk management adaptive corporate governance structures and proactive risk mitigation strategies become vital for enhancing firm resilience during times of economic uncertainty.

Impact of ESG on Financial Stability

The findings in Tables 1 through 4 reveal in-depth associations between the ESG practices of companies and their financial outcomes as assessed by TOBIN's Q measurements. Risk management levels differ substantially between firms with TOBIN ratios spanning from 0.62 to 6.57 while ESG scores exhibit no major discrepancies since SOCs (51.60%) and GOVs (55.01%) exceed ENVs (49.79%). The correlation assessment indicates TOBIN demonstrates positive associations with SOCs, and GOVs together with ESGs yet shows negative associations with ENVs. Social aspects and governance in addition to financial performance serve to boost performance whereas environmental impact shows negative relationships with financial angles or requires funding that delays positive financial effects. The univariate correlation analysis remains restricted since it fails to account for elements that could influence the results like firm size and financial slack or debt levels (Aydoğmuş et al., 2022). The results from Table 2 require multivariate regression analysis to properly identify ESG dimensions' risk management effects after considering possible controlling variables. Statistical analysis of regression data verifies that ENVs, SOCs, and GOVs have positive significant relationships to TOBIN score which supports H1a to H1d. The analysis shows SOCs and ESGs produce greater coefficients on TOBIN compared to GOVs and ENVs indicating social responsibility and overall ESG performance are considered more important than financial governance and environmental management in risk management operations. Leadings from stakeholder theory confirm that firms that strengthen their ESG practices acquire financial sustainability through legitimacy expansion alongside operational risk reduction and enhanced stakeholder relationships (Rehman et al., 2021).

The analysis in Table 4 displays detailed information by checking how ESG practices affect risk management in both developed and developing economic systems. These research findings show that environmental and social practices generate higher-quality risk management systems within developed markets since their coefficients come out as positive and statistically significant. The implemented ESG initiatives produce superior results for developed economy firms because these economies have rigorous regulatory frameworks and sustainable firm preferences among investors together with elevated consumer awareness about sustainability (Agbakwuru et al., 2020). The insignificant GOVs*DEVEL results show corporate governance practices create equal financial sustainability benefits across different market development levels demonstrating that universal financial determination exists regardless of economic status. The financial success of extensive ESG strategies is supported by the positive significant effect observed through ESGs*DEVEL in developed economic environments. The study confirms how environmental factors including market regulation and development stage and institutional pressures determine the financial benefits firms can achieve through ESG engagement as found by Singhania & Saini (2023). Firms within developing economies encounter difficulties in embracing ESG principles because of their poor institutional frameworks together with minimal stakeholder demands and financial obstacles (Kilic et al., 2022). The economic development level influences ESG relations which demonstrates a strong basis for policy-makers and strategic organizations to customize sustainability programs for specific economic and regulatory requirements to achieve both economic advantages and societal benefits.

Conclusion

This study examines the impact of ESG practices on the financial stability of corporate risk management firms, while also drawing comparisons with firms operating in both developed and developing countries. This study demonstrates that both individual and aggregate ESG practices exhibit a positive correlation with financial performance. The analysis is founded on an extensive dataset comprising 34,953 firm observations collected from 49 nations over the period from 2002 to 2022. In addition, industrialized nations receive the benefits of ESG initiatives in risk management to a greater extent. More research has shown that enhanced financial sustainability in both developed and developing economies is directly related to more ESG practices. The principal conclusions of the study regarding the impact on corporate risk management are as follows: ROA negatively influences indebtedness and liquidity. The presence or absence of diversity among Chief Executive Officers significantly influences both debt and liquidity. These findings elucidate the criteria employed in the selection of variables, specifically highlighting the significance of corporate governance and other independent factors in determining a company's levels of debt, liquidity, and overall performance. Investors and managers should maximize the profitability and sustainability of their companies by making better decisions based on a better knowledge of these linkages (Singhania & Saini, 2023).

Multiple stakeholders are poised to derive significant advantages from the findings of this study. For example, the results indicate that business managers who wish to raise shareholder value and boost financial sustainability need to establish and implement proactive ESG policies (Landi et al., 2022). Companies should prioritize ESG practices by implementing environmental preservation strategies while executing social advancement programs as well as establishing firm governance procedures (Kilic et al., 2022). The research outcomes help investors who worry about sustainability issues to find responsible environmental businesses for making well-informed investment choices. Effective laws and regulations supported by national and international authorities need to assist enterprises in promoting ESG practices along with corporate sustainability according to Rehman et al (2021).

It is recommended that the firms chosen for analysis explicitly and precisely delineate the factors that may influence their debt and liquidity challenges. These influencing factors can affect risk in various manners; consequently, organizations must ascertain whether internal or external elements are exerting an impact on them, contingent upon their operational environment, industry sector, and other relevant considerations.

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APPENDICES

Appendix 1

Variables	Symbols	Descriptions
Dependent variable		
Financial Stability	TOBIN	$\frac{\text{Market capitalization} + \text{Total liabilities}}{total\ assets}$
Independent variables		
Environmental	ENVs	Environmental scores
Social	SOCs	Social scores
Governance	GOVs	Governance scores
ESG	ESGs	Environmental scores
Country groups	DEVEL	Dummy variable = 1 or 0
Control variables		
Firm size	FSIZE	Total assets
Profitability	FPRFT	$\frac{\text{Net profit}}{Total\ assets}$
Slack	SLACK	$\frac{\text{Total assets}}{total\ assets}$
Capital	CPLIN	$\frac{\text{Longterm Assets}}{Total\ assets}$
Liquidity	LIQDT	$\frac{\text{Current assets}}{current\ liabilities}$
Leverage	DEBT	$\frac{\text{Total liabilities}}{total\ assets}$

Appendix 2

Panel A: ESG practices impact on financial stability				
	(1)	**(2)**	**(3)**	**(4)**
	ALT	**ALT**	**ALT**	**ALT**
ENVs	0.004			
	(0.000)			
SOCs		0.006		

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		(0.001)		
GOVs			0.002	
			(0.000)	
ESGs				0.008
				(0.001)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	34953	34953	34953	34953
Adj. R-squared	0.640	0.640	0.640	0.640
Panel B: ESG practices in developed and developing economies				
	(1)	(2)	(3)	**(4)**
	ALT	**ALT**	**ALT**	**ALT**
ENVs	0.004			
	(0.000)			
ENVs*DEVEL	0.00			
	(0.001)			
SOCs		0.006		
		(0.001)		
SOCs*DEVEL		0.004		
		(0.001)		
GOVs			0.002	
			(0.000)	
GOVs*DEVEL			-0.001	
			(0.001)	
ESGs				0.008
				(0.001)

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ESGs*DEVEL				0.004
				(0.002)
DEVEL	0.940	0.890	0.950	0.880
	(0.122)	(0.122)	(0.120)	(0.121)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	34953	34953	34953	34953
Adj. R-squared	0.640	0.660	0.640	0.640