

The Influence of ESG Performance on the Cost of Debt:
Evidence from Asia Pacific Countries: The Moderating Role of
Economic Policy uncertainty

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This paper examines the influence of ESG performance on the cost of debt (CoD) in Asia-Pacific firms from 2010 to 2022. It is among the first to explore how ESG performance scores affect the cost of debt against different economic conditions and market maturity levels. The study finds that companies with higher ESG ratings, particularly environmental and social dimensions, correlate with lower borrowing costs. Governance scores also matter, but they don't seem to influence borrowing costs as much. Additionally, the paper reveals that ESG's impact on borrowing costs is stronger in developed countries than in emerging ones. The research also indicates that during times of economic uncertainty, firms with better social ESG scores are able to adapt more effectively, which may influence their borrowing costs.



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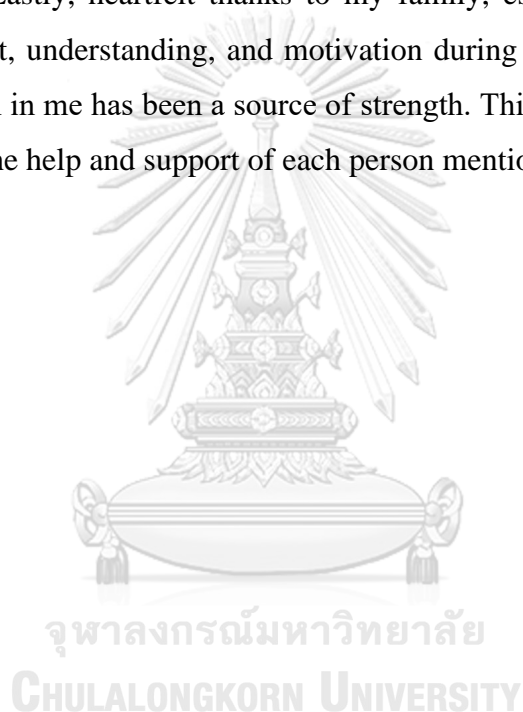


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INTRODUCTION

Cost of Debt, a crucial financial metric for firms, represents the interest rate that a firm pays on its current loans, bonds, and other forms of debt. It holds significant implications for firms' profitability, investment capacity, and overall competitiveness. Gaining a thorough understanding of the factors that impact the cost of debt is essential for firms' strategic decision-making to secure sustainable growth. This comprehension is especially important in the Asia Pacific region, where emerging economies are experiencing rapid growth and integration into the global financial system. Access to affordable financing, or low cost of debt, significantly affects firms' ability to attract investments and sustain their expansion in this dynamic market.

Environmental, Social, and Governance (ESG) practices, which have gained prominence as key considerations for society at large, are rooted in the concept of Corporate Social Responsibility (CSR). CSR, which emerged before the advent of ESG, focuses on a firm's ethical obligations and its impact on various stakeholders. Both CSR and ESG are interrelated in this context, as they share the goal of promoting sustainable and responsible business practices.

ESG performance encompasses a firm's commitment to environmental stewardship, social impact, and corporate governance standards. Firms that demonstrate strong ESG performance, often evaluated through an ESG performance score, are not only seen as responsible corporate citizens but also believed to face lower operational and financial risks. As sustainability gains global attention, investors, regulators, and other stakeholders are increasingly incorporating ESG criteria into their decision-making processes, which can have implications for the cost of debt. By effectively managing their ESG practices, firms can enhance their attractiveness to lenders and potentially reduce their borrowing costs, thereby creating a positive relationship between ESG performance and the cost of debt.

The association between a firm's ESG performance and its cost of debt is an area of growing interest in academic research. Previous studies have indicated a potential link between strong ESG performance and lower borrowing costs. Goss and Roberts

(2011) discovered that firms with higher CSR scores receive reduced costs of bank loans. Chava (2014) noted that firms exposed to environmental externalities, notably those with high emissions, poor environmental performance, and increased exposure to environmental regulations, tend to face higher capital costs. Conversely, Erragragui (2018) observed that strengths in governance and the environment can lower firms' cost of debt, while environmental concerns can increase it. These findings highlight the intricate link between a firm's ESG performance and its debt expenses, influenced by factors like decreased financial risks, improved stakeholder relationships, and enhanced operational efficiency through good corporate governance.

Economic policy uncertainty is indeed a critical factor that affects how firms make financial decisions and has substantial implications for the cost of debt. Economic uncertainty refers to the unpredictable in macroeconomic conditions, such as changes in government policies, geopolitical tensions, or shifts in international financial regulations. These fluctuations can have widespread impacts on borrowing prices as creditors perceive higher risks associated with lending to firms. Consequently, businesses face higher loan expenses.

However, the firm's ESG performance can serve as a framework for responsible business conduct, aiding in navigating this uncertain landscape. By adopting robust ESG practices, firms can enhance their resilience and adaptability to changing economic policies, reduce risks, and improve their creditworthiness. This, in turn, can mitigate the negative effects of economic policy uncertainty and potentially lower borrowing costs. Thus, in today's interconnected global economy, it is important to consider the concurrent influence of global economic policy uncertainty when examining the relationship between firms' ESG performance and their cost of debt.

Additionally, it is essential to analyze the role of ESG performance in shaping loan costs in Developed markets as well as Emerging markets. Developed countries generally have well-established regulatory frameworks and mature financial markets, which may cause divergent dynamics between ESG practices and cost of debt. Firms with strong ESG performance may already have better access to capital and lower borrowing costs in comparison with emerging nations where there occurred regulatory

gaps, varying levels of institutional development, and different stakeholder expectations. Therefore, investigating how the association between firms' ESG performance and their debt cost differs among varying atmospheres can be beneficial for policymakers, investors, and firms operating in these diverse market contexts.

Building upon prior research, this study aims to explore the impact of ESG performance on the cost of debt extended by banks in Asia Pacific countries. It aims to contribute a novel addition to the current body of literature in three key aspects: First, it seeks to present a fresh interpretation on the concurrent influence of economic policy uncertainty on lending decisions of banks. Second, it identifies the critical driver among the sub-indicators of ESG performance that significantly affects the valuation effect on companies' borrowing costs. Lastly, the study highlights the variations in the role of firms' ESG engagement on their cost of debt between developed and emerging markets.

Through these contributions, this paper offers valuable comprehension for financial institutions and firms, enabling more informed decisions in an increasingly complex business environment. By knowing the interplay between corporate sustainability, economic policy uncertainty, and market circumstances, relevant stakeholders can enhance their strategic decision-making and promote sustainable growth.

LITERATURE REVIEW

The opening chapter recognizes the longstanding presence of CSR prior to the emergence of ESG practices, while underscoring their intricate interrelation within this research context. Academic researchers from various disciplines have engaged in an active debate on the economic consequences of CSR/ESG practices for firms. Numerous papers have contributed to this discourse, employing diverse conceptual models, to clarify these practices and their connection to a firm's characteristics. The following paragraphs provide illustrative examples of prominent theories that have been utilized in this field of study.

In recent years, sustainable finance has experienced significant growth, with institutional investors and funds embracing different approaches. The increasing

mainstream adoption is a positive development. Amidst this vibrant growth, there is notable variation in the terminology and practices associated with ESG investing. This variation can be attributed to the earlier philosophies of socially responsible investment (SRI), which primarily focused on excluding certain investments based on ethical concerns. The emergence of ESG concept signifies a departure from traditional approaches by considering a broader range of ESG factors in investment decisions. Such practice encompasses a wide range of activities undertaken by firms, and extends beyond traditional financial metrics, reflecting the changing demands of the finance industry as a whole.

One such theoretical framework is the Legitimacy Theory, as described by Deegan (2011), which emphasizes a firm's active pursuit of CSR initiatives to establish and sustain a favorable reputation, ensures their legitimacy and obtaining public support. This, in turn, enables them to avoid penalties and overcome resource limitations.

In addition, Gray, Kouhy and Lavers (1995) proposed Institutional Theory, suggesting that firms are influenced by external pressures stemming from societal and institutional forces. These forces encompass regulations, requirements, and laws related to environmental protection, industry practices, and cultural values, significantly impacting a firm's financial decisions, performance metrics, and code of conduct.

Although not explicitly highlighting specific theory, a study by Chava (2014) found that the more firms exposed to environmental externalities, the higher cost of capital, particularly those with poor environmental performance and higher exposure. In a related study by LINS, SERVAES and TAMAYO (2017)], the positive effect of CSR on firm performance is stronger in countries with lower levels of social trust. Similarly, a comprehensive study by Friede, Busch and Bassen (2015) provides empirical evidence supporting a positive relationship between ESG practices and financial performance. These findings indicate that the context surrounding CSR/ESG performance potentially influence a firm's financing costs, which in turn may have implications for the extension of private debt by financial institutions.

By incorporating the Legitimacy Theory and the Institutional Theory, the research intends to shed light on how ESG practices, driven by societal and institutional forces, can shape banks' lending behavior in the APAC countries. Furthermore, this study aims to synthesize existing findings while identifying potential gaps and areas for further exploration, such as the interaction of different ESG criteria and the relevance of sub-criteria in driving positive performance impacts.

HYPOTHESIS DEVELOPMENT

1. The impact of firms' ESG performance on their cost of debt

Lending institutions are increasingly prioritizing ESG issues due to the recognition that extending loans to firms involved in negative ESG practices can lead to adverse perceptions from society. This awareness has been reinforced by the endorsement of the United Nations Environment Programme's Declaration on the Environment and Sustainable Development by numerous banks worldwide in 2012. As a result, banks have started integrating ESG data into their internal procedures, including risk assessment and management checklists.

The study carried out by Thompson and Cowton (2004), which examined the inclusion of responsible investment criteria in UK banks' lending principles, can be cited to reinforce this statement. According to the findings, 60% of banks had implemented lending principles that incorporated responsible investment criteria. This demonstrates a tangible implementation of ESG factors in banks' lending choices.

While the significance of ESG practices for firms is widely acknowledged, the influence of these strategies on the cost of debt extended by banks remains a subject of debate in academic research. On one hand, Hoepner et al. (2016) and Erragragui (2018) found neither a notable nor a beneficial correlation between corporate sustainability performance and the borrowing expense.

However, Hasan and Habib (2019) demonstrated that banks recognize the role of social capital in reducing risks in debt contracts, leading to more favorable terms for firms located in counties with higher social capital. This suggests a potential parallel

between social capital and ESG practices, as both are perceived by individuals as risk-mitigating factors in debt contracting.

In line with this, our study focuses on previous researches (Goss and Roberts (2011); Crifo, Diaye and Oueghlissi (2017)) that suggest a negative association between ESG performance or its precursor, CSR, and the cost of borrowing. These studies indicate that higher ESG or CSR performance is linked to lower debt costs. Drawing from the findings of these prior studies, this study proposes the following hypothesis:

Hypothesis I: Firms' ESG performance is inversely correlated with their cost of debt.

In addition to studying ESG performance on firms' cost of debt, it is essential to consider the specific context of developed market countries. Developed markets present distinct challenges and opportunities regarding ESG practices. Factors such as government regulations, cultural norms, and societal pressures can influence firms' ESG performance in these countries (Brammer, Jackson, & Matten, 2012). Moreover, the integration of ESG factors into lending practices in developed market countries may differ from emerging markets, with varying levels of awareness and adoption of ESG criteria by financial institutions, information availability, data quality, and ESG disclosure by firms. (Eccles, Ioannou, & Serafeim, 2014)

Understanding these dynamics provides a more comprehensive insight into the overall relationship between firms' ESG performance and their cost of debt, considering the unique challenges and opportunities present in developed market countries. The following sub-hypothesis is suggested:

Hypothesis I(a): The prominence of firms' ESG performance in shaping their cost of debt differs between emerging market countries and developed countries.

2. Moderating role of economic uncertainty between ESG performance and cost of debt:

Economic uncertainty plays a crucial role in shaping financial decision-making processes and has significant implications for the cost of debt. In corporate finance, economic uncertainty refers to the unpredictable fluctuations in macroeconomic

conditions, such as GDP growth, interest rates, inflation, and market stability. These fluctuations introduce an element of risk and unpredictability in the business environment, influencing the borrowing costs faced by firms seeking external financing. When economic conditions are uncertain, lenders and investors tend to become more cautious and risk averse. They perceive higher risks associated with lending to firms, which prompts them to demand higher interest rates or impose stricter lending terms. As a result, firms face increased costs of debt, which can pose challenges to their financial performance and investment decisions.

Previous literature has extensively addressed the influence of economic uncertainty on corporate financial and investment decisions. Various methods have been used to measure uncertainty, including proxies for political uncertainty, volatility of macroeconomic and financial indicators, and economic policy uncertainty indices.

Studies by Wang, Chen and Huang (2014) and Gulen and Ion (2016) found that economic policy uncertainty has a negative impact on corporate investment and firm performance. Additionally, recent research by Kaviani et al. (2020) and Iqbal, Gan and Nadeem (2020) demonstrates a significant relationship between changes in economic policy uncertainty and credit spreads, as well as firm performance indicators. These findings collectively emphasize the notable influence of economic policy uncertainty on corporate decision-making and performance. Drawing upon these previous literatures, this study proposes the following hypothesis:

Hypothesis II: The relationship between firms' ESG performance and their cost of debt is influenced by the joint effects of economic uncertainty.

In addition to economic uncertainty, the connection between a firm's ESG performance and its debt cost may also be influenced by the specific market context. A study conducted by Rjiba, Jahmane and Abid (2020) provides insight into the impact of uncertainty on the connection between CSR and corporate financial performance (CFP). The research found that investing in CSR can help reduce the negative effects of economic policy instability on firms' financial performance. This positive impact is especially evident in developed countries during times of economic

uncertainty. This shows that environments with more stable and predictable economic conditions are more conducive to CSR's positive effects on corporate performance.

Based on the prior findings, it is evident that the interaction between economic uncertainty and market context, such as the country of origin of firms, can have implications for the relationship between ESG performance and the cost of debt. While Rjiba, Jahmane and Abid (2020) examined the relationship between economic policy uncertainty, CSR, and firm financial performance, the literature did not specifically analyze the impact of ESG performance on the cost of debt. Our study aims to address this gap by investigating the interplay between ESG performance, economic uncertainty, and the firm's country of origin. By focusing on the contemporary and comprehensive framework of ESG performance, which reflects updated practices in sustainable and responsible business.

DATA SAMPLE

In this research study, our attention is directed towards the combination of publicly listed firms operating in emerging and developed markets¹ within the Asia–Pacific region. We specifically focus on countries where there exists comprehensive coverage of sustainability data, considering factors such as the number of firms involved and the scope of ESG proxies. It has come to our attention, through an analysis of the Refinitiv ESG dataset for Asia–Pacific markets, that there is a limited observation prior to 2010. This scarcity of data has the potential to introduce bias into our conclusions. Consequently, we have made the decision to analyze the data spanning the period from 2010 to 2022 to ensure a more reliable dataset.

Aside from the ESG dataset, we also incorporated financial information of a company sourced from the Refinitiv database. Detailed definitions for each type of variable are provided in subsequent sections of our research. To categorize companies into their respective industry groups, we have employed The Refinitiv Business Classification (TRBC). We exclude banks and financial firms from our analysis as they exhibit distinct financial performance characteristics and ESG practices compared to other industries. After performing data treatment procedures, our dataset consists of 3,307

observations firm-year combinations unbalanced panel data. Countries included in our dataset are Australia, China, Hong Kong, Indonesia, Japan, Malaysia, the Philippines, Singapore, South Korea, Taiwan, and Thailand as seen in below *Table 1*

Table 1. Sample Distribution of Firms Across Asia-Pacific Markets¹

Markets	No. of Firms	(%)
Australia	400	12.10%
China	972	29.39%
Hong Kong	347	10.49%
Indonesia	83	2.51%
Japan	503	15.21%
S. Korea	168	5.08%
Malaysia	348	10.52%
Philippines	39	1.18%
Singapore	91	2.75%
Taiwan	179	5.41%
Thailand	177	5.35%
	3307	100%

¹Classification is based on income and regional criteria derived from the IMF WEO (World Economic Outlook)

1. Independent variable

This research investigates the impact of a firm's ESG practices on its Cost of Debt. To capture the multifaceted nature of ESG, various indicators are utilized as proxies in this study. We obtained ESG annual performance scores from Refinitiv, one of the leading ESG rating agencies. These scores, range from 0 to 100, are based on self-reported information across 15 categories, classified under the E pillar (encompasses aspects such as resource conservation, emission control, product advancement), S pillar (focuses on quality and safety of the workplace, employee development, civil liberties, society, product stewardship), and G pillar (involves governance composition, remuneration strategy, board duties, investors privileges, mission and approach).

Refinitiv defines the ESG Score as an overall measure of a firm's performance in environmental, social, and corporate governance aspects. The ESG controversies score reflects a company's exposure to negative events related to these areas in global

media. The environmental pillar (E) evaluates a company's impact on natural systems and its ability to mitigate risks and capitalize on opportunities. The social pillar (S) assesses the trust-building efforts with its stakeholders. The corporate governance pillar (G) examines systems and processes that ensure acting in the best interests of long-term shareholders.

Table 2. The Independent Variables

Variables	Description
ESG Combine	Average of ESG score and ESG controversies score when there are controversies
ESG Score	Aggregated score on the 10 category weights
E Pillar	Sum score of the category weights (Emissions, Resource, Innovation)
S Pillar	Sum score of the category weights (Community, Human rights, Product, Workforce)
G Pillar	Sum score of the category weights (Shareholders, CSR strategy, Management)

2. Dependent variable

The cost of borrowing is the key interest in our study. To effectively analyze and quantify this variable, we concentrate on the cost of debt as an essential benchmark. By dividing a company's interest expense by the average debt amount, the cost of debt is determined.

Examining the cost of debt provides valuable insights into the financial burden faced by the firm in terms of its interest expenses. This metric allows us to understand the overall cost incurred by the company in managing its debt, serving as a comprehensive measure of its borrowing cost. Please note that the cost of debt is a dynamic indicator that may change over time. By analyzing this variable, we can identify trends and patterns to gain a deeper understanding of how borrowing costs fluctuate and their implications for the financial health of the firm.

3. Control variables

The firm's credit risk is taken into consideration using control variables. Firm size, leverage, return on assets, and interest coverage ratio are commonly used control variables in financial research.

Leverage is measured by the firm's total debt deflated by total assets. Leverage is added to capture the impact of a firm's existing debt burden on private debt that banks provide. Higher levels of leverage may raise a firm's credit risk and affect banks, willingness to provide additional debt.

Return on Assets (ROA) is a metric that assesses a firm's profitability by calculating the net income generated relative to its total assets. It is frequently used as a gauge for a firm's operational efficiency and profitability. Higher ROA values may suggest better financial health and a lower credit risk, potentially influencing the bank's decision to provide debt.

Interest Coverage Ratio is computed by subtracting interest expenditures from a firm's operating income. This ratio is included to capture the ability of a firm to service its existing debt. A higher ratio implies a greater ability to meet interest payments, potentially influencing the bank's decision to extend debt.

4. Moderating variable

This study incorporates the World Uncertainty Index (WUI) developed Ahir, Bloom and Furceri (2022) as a moderating variable. The WUI provides a comprehensive and quantifiable measure of significant global uncertainty events over time. It is derived from the frequency of the term uncertainty (or its variant) in quarterly reports published by the Economist Intelligence Unit (EIU) for individual countries worldwide. To ensure comparability across countries and periods, the occurrence counts are normalized by dividing them by the total number of words in the reports.

The normalized indices are subsequently rescaled by multiplying them by 1,000, facilitating easier interpretation and manageability of the index values. Higher index values indicate elevated levels of uncertainty within a specific country and time period, signifying a greater degree of uncertainty experienced. Conversely, lower index values correspond to relatively lower levels of uncertainty.

The table below contains a summary of the World Uncertainty Index in selected countries from 2010 to 2022. All indices have been aggregated from quarterly data to annual data to align with the dataset of firm-year combinations in a panel data.

Table 3. The World Uncertainty Index of the Sample Countries

	AUS	CHN	HKG	IDN	JPN	KOR	MYS	PHL	SGP	THA	TWN
2010	0.719	0.963	0.931	0.281	0.637	1.243	0.374	0.490	0.000	0.438	0.944
2011	0.975	0.000	0.403	0.411	1.138	0.974	0.095	0.300	0.197	0.540	0.840
2012	0.530	0.850	0.669	1.289	1.323	1.943	0.659	0.285	0.256	0.481	1.033
2013	0.139	0.386	0.439	0.367	0.616	0.313	0.898	0.077	0.175	0.515	0.911
2014	0.474	0.508	0.162	0.659	0.489	1.220	0.176	0.251	0.000	1.188	1.095
2015	0.697	0.388	0.282	0.443	0.551	0.527	0.807	0.598	0.429	1.205	0.850
2016	0.996	0.325	0.255	0.518	0.647	0.280	0.260	1.017	0.342	1.370	1.793
2017	1.230	0.394	0.000	0.145	0.213	0.250	0.572	0.778	0.424	1.183	0.400
2018	0.689	0.662	0.085	0.070	0.338	0.375	0.158	0.410	0.256	0.740	0.000
2019	0.863	1.157	0.251	1.084	0.821	0.468	0.159	0.515	0.180	0.448	0.000
2020	1.258	1.417	1.235	0.448	0.991	0.350	0.588	0.861	0.525	0.343	0.415
2021	1.020	0.714	1.494	0.505	0.360	0.452	1.538	1.354	0.969	0.834	0.502
2022	0.775	1.509	0.338	0.692	0.805	0.717	0.650	0.712	1.134	0.918	0.872

METHODOLOGY

1. Impact of ESG performance on the borrowing cost

To investigate the association between multifaceted ESG and firms' borrowing costs, as hypothesized in the previous section, we rely on a regression analysis in Equation (1).

$$CoD_{it} = \alpha + \beta_1(ESG^K_{it}) + \beta_2(Size_{it}) + \beta_3(Lev_{it}) + \beta_4(ROA_{it}) + \beta_5(IntCov_{it}) + \beta_6(CountryFE) + \beta_7(TimeFE) + \varepsilon_{it} \quad (1)$$

Where i is the i th company, t is the t th year. CoD denotes the Cost of Debt. ESG^K is the proxy for multi-dimensional corporate sustainability performance (an aggregate ESG factor in the main model and E, S, G or ESG score in additional tests). $Size$

denotes the firm's size, *Lev* denotes Leverage ratio, *ROA* denotes Return on Assets ratio, *IntCov* denotes Interest Coverage ratio, The country-fixed effect (*CountryFE*) accounts for unchanging country characteristics that could potentially influence both ESG performance and Cost of Debt, considering that different countries may have varying ESG policies. The time-fixed effect (*TimeFE*) is utilized to control for variables that are consistent within firms but change over time. α is the constant term, β_1 to β_7 are parameters, ε_{it} is the error term.

From this regression analysis, we are primarily interested in the anticipated coefficient β_1 assigned to *ESG^K*, which is expected to display a negative sign and indicate statistical significance. This finding implies a strong association, where higher ESG performance scores are connected to lower debt costs. Notably, this observation aligns with previous research [1] and reinforces our **Hypothesis (I)**, which proposes a negative correlation between ESG practices and bank loans.

For the sub-hypothesis I(a), which states that the prominence of firms' ESG performance in shaping their cost of debt differs between emerging and developed countries, the regression model is presented in Equation (2).

$$CoD_{it} = \alpha + \beta_1(ESG^K_{it}) + \beta_2(DEVELOPED_{it}) + \beta_3(ESG*DEVELOPED_{it}) + \beta_4(Size_{it}) + \beta_5(Lev_{it}) + \beta_6(ROA_{it}) + \beta_7(IntCov_{it}) + \beta_8(CountryFE) + \beta_9(TimeFE) + \varepsilon_{it}$$

----- (2)

The dummy variable (*DEVELOPED*) is introduced in this model and can be defined as; 1 for Developed Markets and 0 for Emerging Markets. *ESG*DEVELOPED* denotes the interaction term of ESG performance and the dummy variable, capturing the joint effect of ESG performance and market development status on the outcome variable.

We expected the estimated coefficient β_2 assigned to *DEVELOPED* and the β_3 assigned to *ESG*DEVELOPED* in the regression model to be statistically significant. The significance of these coefficients will lend support to our **Hypothesis I(a)**, which posits a disparate impact of firms' ESG performance on their cost of debt between emerging and developed countries. The specific direction (positive or negative) of

these coefficients will be determined after conducting the analysis and will provide further understanding of how market development status influences the interaction between ESG performance and the cost of debt.

2. Moderating role of economic uncertainty between ESG performance and cost of debt

In the previous section (Hypothesis II), we anticipate that relationship between firms' ESG performance and their cost of debt would be influenced by the joint effects of economic policy uncertainty. The following model presents regression Equation (3).

$$CoD_{it} = \alpha + \beta_1(ESG^K_{it}) + \beta_2(WUI_{it}) + \beta_3(ESG*WUI_{it}) + \beta_4(Size_{it}) + \beta_5(Lev_{it}) + \beta_6(ROA_{it}) + \beta_7(IntCov_{it}) + \beta_8(IndustryFE) + \beta_9(TimeFE) + \varepsilon_{it} \quad (3)$$

This model takes into account the level of economic policy uncertainty in each country. Where *WUI* denotes the World Uncertainty Index for each country, *ESG*WUI* denotes the interaction term of ESG performance and Index, capturing the joint effect of ESG performance and economic policy uncertainty on the Cost of Debt in each country.

We expect that the coefficients β_2 assigned to *WUI* and β_3 assigned to *ESG*WUI* in regression Equation (3) will both exhibit statistical significance. These anticipated outcomes will serve to support our **Hypothesis II**, which suggests that the relationship between firms' ESG performance and their cost of debt is influenced by the combined effects of economic policy uncertainty. The direction of these coefficients will be determined following the completion of the regression analysis. Once the analysis is conducted, the findings will contribute to a deeper understanding of whether an increase in the level of economic policy uncertainty is associated with a rise or decline in the cost of debt for firms. Furthermore, the results will shed light on whether the uncertainty weakens or amplifies the positive impact of ESG performance on reducing the cost of debt.

RESULTS AND DISCUSSIONS

1. Descriptive Statistic of the data

Table 4. Overall Descriptive Statistic

Variable	Mean	Median	Std.Dev	Min	Max
<i>Dependent Variable</i>					
Cost of Debt	3.85%	2.82%	3.58%	0.46%	14.62%
<i>Independent Variables</i>					
ESG Combine Score	43.46	43.73	20.05	0.66	92.75
ESG Score	44.19	44.54	20.62	0.66	93.59
Environmental Pillar	40.62	41.37	27.73	0.00	98.64
Social Pillar	41.56	40.34	24.21	0.05	98.01
Governance Pillar	50.18	50.68	22.28	0.10	98.74
<i>Control Variables</i>					
Return On Assets	0.0559	0.0458	0.0487	-0.0235	0.1702
Interest Coverage	51.4331	10.5351	102.2237	-2.7223	412.4009
Leverage	0.2242	0.2127	0.1534	0.0056	0.5309

Table 4. presents the descriptive statistics for the primary and control variables used in this research focusing on the Asia-Pacific region from 2010 to 2022. The dependent variable, **Cost of Debt**, registers a mean of approximately 3.85%, which mirrors the average cost firms bear when incurring debt. However, with the median value recorded at 2.82%, it suggests a distribution that leans slightly towards the right, with many firms having lower costs. The variability is pronounced with a standard deviation of 3.58%, reflecting differing financial structures and debt arrangements across firms. The spectrum of the Cost of Debt spans from as low as 0.46% to a substantial 14.62%.

Delving into the independent variables that gauge Environmental, Social, and Governance (ESG) performance, the overall **ESG Combine Score** across firms averages at 43.46 out of a possible score of 100. This portrays a modest trend in overall ESG performance in the Asia-Pacific region. The inherent variation, signaled

by a standard deviation of 20.05, reflects the diverse commitment of firms to ESG principles. Breaking this down, the **Environmental Pillar** has an average score of 40.62, denoting a median environmental conscientiousness among firms. This is further substantiated by its standard deviation of 27.73. The **Social Pillar**, with a mean of 41.56, mirrors this trend, having a standard deviation of 24.21. Contrarily, the **Governance Pillar** stands out, registering the highest average at 50.18, signaling a more rigorous governance practice in the firms across this region.

Turning to the control variables: **Return On Assets (ROA)**, a measure of profitability, averages at 0.0559. The data showcases a median profitability level, with a few outliers indicated by its minimum and maximum values. **Interest Coverage Ratio (IntCov)**, standing at an average of 51.4331, suggests that firms, on average, have a substantial ability to meet their interest obligations. This is corroborated by a high median of 10.5351. **Leverage Ratio (Lev)**, with a mean of 0.2242, insinuates that firms have a balanced approach to debt financing in relation to their total assets. This aligns with the modest nature of the Cost of Debt seen in the region.

Table 5. Correlation Matrix of Study Variables

	<i>Y_COD</i>	<i>ESG Combine</i>	<i>ESG Score</i>	<i>E Pillar</i>	<i>S Pillar</i>	<i>G Pillar</i>	<i>ROA</i>	<i>IntCOV</i>	<i>Lev</i>
<i>Y_COD</i>	1.0000								
<i>ESG Combine</i>	-0.0551	1.0000							
<i>ESG Score</i>	-0.0597	0.9803	1.0000						
<i>E Pillar</i>	-0.1705	0.8390	0.8566	1.0000					
<i>S Pillar</i>	-0.0028	0.8882	0.9046	0.7172	1.0000				
<i>G Pillar</i>	0.0239	0.6628	0.6790	0.3833	0.4352	1.0000			
<i>ROA</i>	0.0851	-0.0647	-0.0712	-0.1141	-0.0487	-0.0242	1.0000		
<i>IntCOV</i>	-0.0271	-0.0699	-0.0764	-0.0820	-0.0859	-0.0355	0.4327	1.0000	
<i>Lev</i>	-0.2911	0.0327	0.0387	0.0804	0.0265	-0.0052	-0.3605	-0.4609	1.0000

Table 5. also includes a correlation matrix detailing the pairwise correlations between the primary and control variables. It can be seen that the Cost of Debt (*Y_COD*) does

not seem to have strong correlations with most of the other variables. Notably, it has a small negative relationship with the overall ESG Combine Score and individual ESG pillars, suggesting that as ESG scores increase, the Cost of Debt might decrease marginally. This observation is particularly pronounced for the Environmental (E) Pillar, which has a correlation of -0.1705 with the Cost of Debt.

The correlation between the ESG Combine Score and individual ESG pillars is understandably strong, given that the combined score is an aggregation of these pillars. The high correlation value of 0.9803 between ESG Combine Score and ESG Score reiterates this. Among the pillars, the Social (S) and Governance (G) pillars show a stronger correlation of 0.9046, implying that firms that tend to perform well in social aspects also tend to have better governance structures.

The control variables also offer some interesting patterns. Return On Assets (ROA) has a weak negative relationship with the ESG pillars, particularly the Environmental (E) Pillar and Social (S) Pillar, with correlations of -0.0712 and -0.1141 respectively. The Interest Coverage Ratio (IntCov) has a very weak negative correlation with all the ESG metrics. Lastly, the Leverage Ratio (Lev) has a slightly stronger negative correlation with the ESG pillars and ESG scores, with the most pronounced relationship being with the Environmental (E) Pillar at -0.3605.

It's essential to note that correlation doesn't imply causation. While these relationships give preliminary insights, the regression analyses will provide a more detailed understanding of these variables' interactions and influences.

1.1 Descriptive statistic segmented by Country

Table 6. Descriptive Statistic of Dependent and Independent Variables by Country

Country	Firms	Statistics	Cost of Debt	ESG Combine Score	ESG Score	E Pillar	S Pillar	G Pillar
Australia	400	Mean	6.85%	41.15	42.39	28.79	43.25	52.87
	12.10%	Median	5.53%	39.19	40.14	23.61	40.34	53.38
		SD	0.04	19.34	20.43	26.21	22.37	22.58
China	972	Mean	3.82%	35.02	35.12	31.84	28.45	46.96
	29.39%	Median	3.16%	32.92	32.97	28.53	24.66	45.88
		SD	0.03	16.91	17.01	24.05	19.40	20.79
Hong Kong	347	Mean	4.19%	45.36	45.66	42.21	41.94	53.98
	10.49%	Median	3.24%	46.89	47.23	44.82	41.35	54.30
		SD	0.03	17.18	17.32	25.84	21.69	19.76
Indonesia	83	Mean	7.53%	45.10	45.15	34.98	50.02	47.37
	2.51%	Median	6.76%	44.42	44.58	31.82	49.87	48.01
		SD	0.04	19.86	19.88	24.93	23.11	22.23
Japan	503	Mean	1.75%	46.68	47.80	50.81	42.37	49.91
	15.21%	Median	1.12%	48.92	50.38	56.00	42.54	50.61
		SD	0.02	20.36	21.08	28.19	24.13	22.91
South Korea	168	Mean	3.87%	45.53	47.35	46.07	45.31	49.84
	5.08%	Median	3.22%	50.03	54.15	54.32	49.66	52.01
		SD	0.03	23.51	24.70	30.11	28.44	24.07
Malaysia	348	Mean	5.08%	46.22	46.40	37.05	49.64	51.15
	10.52%	Median	4.08%	45.92	46.03	34.62	51.58	50.47
		SD	0.03	18.38	18.47	23.37	21.87	21.31
Philippines	39	Mean	5.16%	42.74	43.01	37.82	43.79	48.95
	1.18%	Median	4.22%	41.65	41.86	36.51	42.84	49.77
		SD	0.03	20.23	20.33	24.86	22.95	23.22
Singapore	91	Mean	3.36%	42.68	43.17	40.07	43.00	46.86
	2.75%	Median	2.90%	42.98	43.74	42.48	44.44	47.39
		SD	0.02	18.96	19.35	24.96	21.92	23.22
Taiwan	179	Mean	2.48%	45.97	46.47	44.93	45.94	48.48
	5.41%	Median	1.71%	48.11	48.77	47.19	47.29	48.92
		SD	0.03	23.32	23.55	27.02	28.72	23.78
Thailand	177	Mean	4.22%	52.10	52.32	44.51	57.89	51.50
	5.35%	Median	3.51%	55.33	55.58	46.82	61.66	52.59
		SD	0.03	18.69	18.75	26.46	21.87	21.37

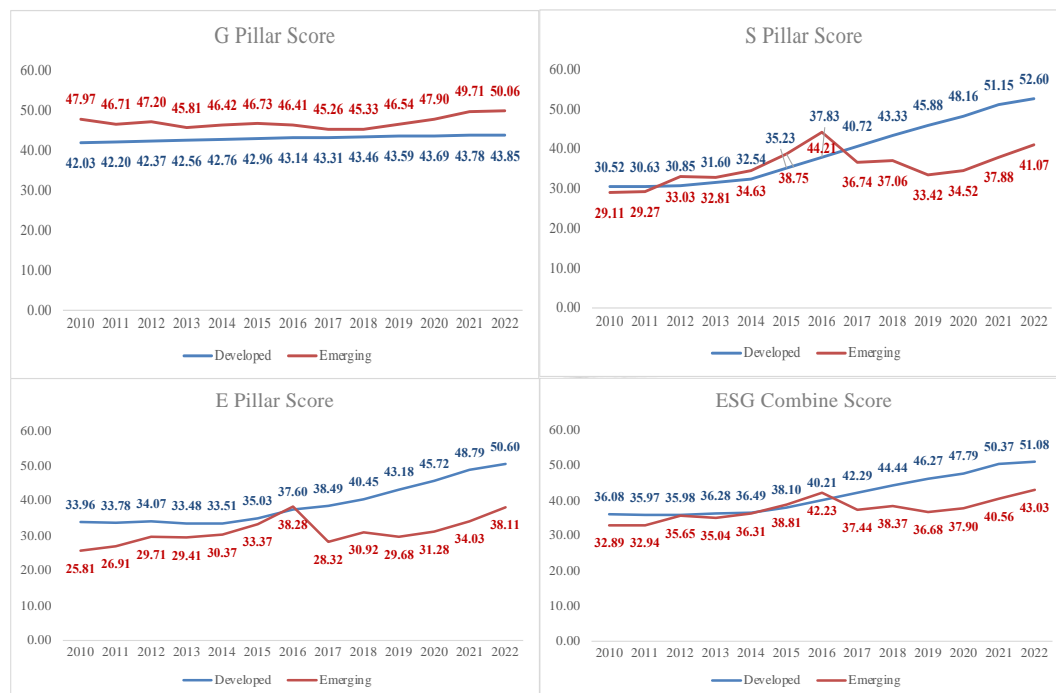
Table 6. offers a comprehensive breakdown of descriptive statistics for both the dependent and independent variables, segmented by individual countries within the Asia-Pacific region. Observing the dataset, China stands out with a commanding 29.3% of the total observations, a testament to its economic dominance in the region. On the opposite end of the spectrum, the Philippines contributes a mere 1% to the dataset.

When examining the Cost of Debt, discrepancies are evident across nations. Australia, for instance, has an average Cost of Debt of 6.85%, presenting a moderate borrowing rate. In contrast, Indonesia experiences a steeper average Cost of Debt at 7.53%, pointing to the unique financial and economic circumstances each country faces.

When turning our attention to the ESG Combine Score, Thailand emerges as the frontrunner with an impressive average score of 52.50, signaling a strong commitment to ESG principles. In stark contrast, China registers a more modest average score of 35.02, hinting at potential avenues for improvement in its ESG practices.

Delving deeper into the ESG pillars, for the Environmental Pillar, Japan sets the benchmark with an average score of 49.98, showcasing its emphasis on eco-friendly practices. Australia, however, trails with an average of just 40.14, possibly influenced by its rich natural resources and mining-centric economic activities. In the realm of the Social Pillar, Thailand outperforms its counterparts with an apex score of 57.89, epitomizing its commitment to social endeavors. China, conversely, portrays a more conservative average of 28.45, reflecting its distinct societal and cultural dynamics. Examining the Governance Pillar, Hong Kong stands tall with an average score of 53.98, underscoring its rigorous governance standards. In contrast, China's average of 50.79, although commendable, suggests there's room to fortify its governance structures. This could be attributed to the significant government influence on Chinese enterprises, which might lead some to prioritize local regulations and government agendas over international best practices.

In essence, the intricacies and diversity across the Asia-Pacific countries, both in financial metrics and ESG adherence, underscore the complex tapestry of economic, cultural, and political factors influencing the region.



Figures 1-4. ESG performance trend from 2010 to 2022

Reviewing the ESG progression from 2010 to 2022, as depicted in the provided figures 1-5, several discernible patterns emerge. Developed countries consistently demonstrate a gradual annual rise in their combined ESG scores, emphasizing their steady commitment to sustainable practices. On the other hand, emerging markets exhibit a similar growth pattern until 2016. However, a noticeable deviation occurs as their performance starts to decline, creating a gap in comparison to their developed peers. Yet, by 2019, emerging markets manage to course-correct, re-embracing an upward trajectory. This overarching trend can also be observed in the Environmental and Social pillar scores, showcasing parallel ESG movements for both market classifications. In contrast, the Governance pillar displays a unique trend: both developed and emerging markets experience minimal fluctuations, maintaining a near-constant score across the span from 2010 to 2022. This suggests a widespread,

consistent approach to governance standards, irrespective of the market's developmental stage.

Table 7. Descriptive Statistic of Control Variables and Moderating Variable by Country

Country	Firms	Statistics	ROA	IntCov	Leverage	WUI
Australia	400	Mean	5.77%	24.33	0.20	0.80
	12.10%	Median	5.08%	5.99	0.19	0.78
		SD	0.05	65.53	0.14	0.31
China	972	Mean	6.30%	50.89	0.23	0.71
	29.39%	Median	5.06%	9.57	0.22	0.66
		SD	0.05	102.76	0.15	0.45
Hong Kong	347	Mean	5.32%	32.69	0.23	0.50
	10.49%	Median	4.10%	7.50	0.23	0.34
		SD	0.05	77.28	0.15	0.46
Indonesia	83	Mean	8.20%	44.70	0.23	0.53
	2.51%	Median	7.38%	9.64	0.21	0.45
		SD	0.06	91.21	0.16	0.34
Japan	503	Mean	4.97%	88.39	0.22	0.69
	15.21%	Median	4.30%	27.11	0.20	0.64
		SD	0.04	129.00	0.16	0.32
South Korea	168	Mean	4.13%	29.48	0.23	0.70
	5.08%	Median	3.09%	5.93	0.23	0.47
		SD	0.05	69.61	0.15	0.51
Malaysia	348	Mean	5.96%	41.75	0.24	0.53
	10.52%	Median	5.02%	7.14	0.24	0.57
		SD	0.05	96.36	0.15	0.40
Philippines	39	Mean	5.46%	8.08	0.30	0.59
	1.18%	Median	4.96%	5.06	0.32	0.52
		SD	0.03	9.63	0.12	0.35
Singapore	91	Mean	5.04%	37.19	0.24	0.38
	2.75%	Median	3.75%	7.45	0.25	0.26
		SD	0.04	90.49	0.14	0.34
Taiwan	179	Mean	6.33%	63.68	0.21	0.78
	5.41%	Median	5.16%	16.22	0.19	0.74
		SD	0.05	109.57	0.14	0.36
Thailand	177	Mean	6.42%	28.17	0.31	0.74
	5.35%	Median	5.86%	5.47	0.32	0.85
		SD	0.05	77.23	0.16	0.48

Table 7. showcases the descriptive statistics of control variables, specifically, statistics related to ROA, Interest Coverage (IntCov), Leverage (Lev), and the World Uncertainty Index (WUI index) for 11 sample countries across the Asia-Pacific region.

Starting with the Return on Assets (ROA), Japan and South Korea display robust mean ROA values, signifying that firms in these nations generally exhibit commendable profitability. In contrast, Indonesia and Hong Kong demonstrate relatively lower mean ROA values, pointing towards moderate profitability within firms in these countries.

Diving into Interest Coverage (IntCov), which serves as a metric for a company's ability to service its debt, it is evident that Japan has a particularly high mean IntCov value. This suggests that Japanese firms, on average, can comfortably meet interest obligations on their outstanding debt. On the other end of the spectrum, Indonesia and the Philippines present relatively lower mean IntCov values, indicating potential challenges in debt servicing for firms in these territories.

When observing Leverage, representing a firm's level of indebtedness, the Philippines stands out with a relatively high mean leverage, signaling that businesses in this country typically have substantial debt proportions. Meanwhile, Singapore and Taiwan maintain lower mean leverage figures, hinting at a cautious stance towards accumulating debt.

Lastly, the WUI index, which could be related to a specific industry or market parameter, sees variations across the nations. Countries like Australia and Taiwan register higher mean WUI values, while Hong Kong and Indonesia lie on the lower side of the spectrum. These disparities might arise due to differences in industry dynamics, regulatory frameworks, or market characteristics within these countries.

THE RESULTS OF THE HYPOTHESES

This section elucidates the regression outcomes specifically designed to test the hypotheses and models postulated at the outset of this research. Additionally, in-depth evaluations have been undertaken to validate the resilience and consistency of our regression framework. To address potential concerns of omitted variable bias, which might stem from unseen heterogeneity present within our dataset, we have diligently integrated both industry and year fixed effects into our analytical model.

Moreover, to ensure the dependability of our regression findings, we initiated a comprehensive multicollinearity examination using a correlation matrix. This matrix highlighted that the coefficients of the variables in our regression maintain a modest level of correlation, with all values notably beneath the critical 0.8 threshold. Such observations convincingly reaffirm the absence of collinearity complications in our study, thus enhancing the credibility of our presented results.

The result of Hypothesis 1

Table 8. Impact of ESG Performance on Cost of Debt

VARIABLES	(1) Model 1 ESG Combine	(2) Model 2 ESG Score	(3) Model 3 E pillar	(4) Model 4 S pillar	(5) Model 5 G pillar
ESG Combine	-4.69e-05*** (1.22e-05)				
ESG Score		-5.08e-05*** (1.18e-05)			
E pillar			-6.34e-05*** (8.92e-06)		
S pillar				-4.19e-05*** (1.04e-05)	
G pillar					-2.53e-06 (1.03e-05)
ROA	-0.0293*** (0.00545)	-0.0293*** (0.00545)	-0.0298*** (0.00544)	-0.0291*** (0.00545)	-0.0293*** (0.00545)
IntCov	-2.27e-05*** (2.79e-06)	-2.29e-05*** (2.79e-06)	-2.41e-05*** (2.79e-06)	-2.28e-05*** (2.79e-06)	-2.18e-05*** (2.78e-06)
Lev	-0.0769*** (0.00174)	-0.0769*** (0.00174)	-0.0766*** (0.00174)	-0.0770*** (0.00174)	-0.0770*** (0.00174)
Constant	0.0930*** (0.00145)	0.0932*** (0.00145)	0.0927*** (0.00140)	0.0928*** (0.00143)	0.0916*** (0.00149)
Observations	16,532	16,532	16,532	16,532	16,532
R-squared	0.335	0.335	0.337	0.335	0.335

Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

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

Drawing from a comprehensive dataset in *Table 6*, we explored the intricate relationship between ESG performance and borrowing costs, particularly in the Asia-Pacific region. The findings resonate strongly with our initial hypothesis, elucidating a significant inverse correlation between a firm's ESG credentials and its cost of borrowing.

The combined ESG score, showcased in Model 1, not only underscores this relationship with a statistically significant coefficient of $-4.69e-05$ ($p<0.01$) but also highlights a tangible financial implication: every unit increase in the ESG score potentially corresponds to a decrease in the cost of debt. This finding compellingly reinforces our **Hypothesis I**, which postulated the inverse relationship between ESG performance and the cost of debt.

Dissecting the overarching ESG score into its constituent pillars—Environmental, Social, and Governance—revealed nuanced dimensions of this relationship. Each pillar, as seen in Models 2 to 5, consistently demonstrates significant inverse relationships with borrowing costs, emphasizing the diverse impacts of ESG metrics. The Environmental pillar (Model 3) stands out, with a coefficient of $-6.34e-05$ ($p<0.01$), reinforcing the heightened importance that lenders and investors place on environmental stewardship in today's climate-aware context.

The consistency of control variables—Return on Assets (ROA), Interest Coverage (IntCov), and Leverage (Lev)—across the models, serves as a testament to our rigorous analytical approach. These variables, fundamental financial indicators, are incorporated to control for firm-specific financial health and risk. With an R-squared value hovering around 0.335, our models aptly capture a substantial portion of the variability in borrowing costs.

Remarkably, the results indicate a counterintuitive negative relationship between the Leverage Ratio (Lev) and the Cost of Debt. Typically, higher leverage is associated with greater financial risk, leading to a higher cost of debt. However, our findings suggest a deviation from this conventional wisdom. This peculiar relationship is echoed in our correlation matrix, where the Leverage Ratio and the Cost of Debt display a negative correlation. One potential explanation for this unexpected result is that firms in our sample might have a strategic debt structure, wherein a higher proportion of long-term, low-interest debt reduces the overall cost. Another rationale could be the presence of robust corporate governance practices, which may make lenders more confident about loan repayments, subsequently driving down borrowing costs. Furthermore, regional nuances, especially in the Asia-Pacific context, such as lending practices, industry competition, and macroeconomic conditions, might also influence this relationship. As always, caution is warranted when interpreting these results, and they highlight the importance of understanding the unique financial landscapes of different regions.

In conclusion, our empirical insights not only validate Hypothesis I but also stress the pivotal role of ESG metrics in modern finance. As global attention to sustainability continues to mount, it becomes crucial for firms to prioritize ESG initiatives, not merely for ethical alignment but also to bolster their financial standing. This is a clarion call to firms, investors, and policymakers to integrate ESG considerations into their strategic planning, recognizing its central role in the contemporary financial landscape

The result of Hypothesis 1(a)

Table 9. Impact of ESG Performance on Cost of Debt: Developed vs. Emerging Economies

VARIABLES	(1) Model 1 ESG Combine	(2) Model 2 ESG Score	(3) Model 3 E pillar	(4) Model 4 S pillar	(5) Model 5 G pillar
ESG Combine	3.82e-05 (2.40e-05)				
<i>Developed x ESG Combine</i>	-0.000112*** (2.73e-05)				
ESG Score		3.75e-05 (2.39e-05)			
<i>Developed x ESG Score</i>		-0.000115*** (2.70e-05)			
E pillar			-5.07e-05*** (1.75e-05)		
<i>Developed x E Pillar</i>			-1.69e-05 (2.00e-05)		
S pillar				4.29e-05** (2.07e-05)	
<i>Developed x S Pillar</i>				-0.000111*** (2.34e-05)	
G pillar					5.77e-05*** (2.00e-05)
<i>Developed x G Pillar</i>					-8.17e-05*** (2.33e-05)
Developed	0.0229*** (0.00191)	0.0231*** (0.00191)	0.0177*** (0.00158)	0.0233*** (0.00186)	0.0219*** (0.00181)
ROA	-0.0286*** (0.00545)	-0.0286*** (0.00545)	-0.0297*** (0.00544)	-0.0285*** (0.00544)	-0.0290*** (0.00545)
IntCov	-2.31e-05*** (2.79e-06)	-2.33e-05*** (2.79e-06)	-2.42e-05*** (2.80e-06)	-2.32e-05*** (2.79e-06)	-2.19e-05*** (2.78e-06)
Lev	-0.0771*** (0.00174)	-0.0770*** (0.00174)	-0.0767*** (0.00174)	-0.0770*** (0.00174)	-0.0771*** (0.00174)
Constant	0.0711*** (0.00220)	0.0711*** (0.00220)	0.0752*** (0.00198)	0.0705*** (0.00217)	0.0708*** (0.00210)
Observations	16,532	16,532	16,532	16,532	16,532
R-squared	0.336	0.336	0.337	0.336	0.335
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses

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

Venturing further into our inquiry, we turned our focus to understanding the disparate influence of ESG performance on firms' cost of debt across emerging and developed economies within the Asia-Pacific region. Our findings, as presented across Models 1 to 5, shed light on this dynamic, revealing a set of intriguing nuances.

To begin with, the dummy variable denoting developed markets (1.developed) consistently indicates higher borrowing costs associated with firms in developed economies across the models, substantiated by statistically significant positive coefficients. This observation, at the outset, mirrors global trends where developed economies, grappling with matured financial markets and relatively tighter monetary policies, often exhibit higher debt costs than their emerging counterparts. Notably, the coefficients, ranging from 0.0177 to 0.0233 ($p < 0.01$), emphasize the heightened sensitivity of debt costs to the stage of economic development.

However, the more captivating revelation is unearthed when dissecting the interactions of ESG pillars with the developed market dummy. Our analysis points towards the pronounced beneficial effect of robust ESG credentials in mitigating the cost of debt specifically for firms domiciled in developed markets. For instance, while the overall ESG Combine score in Model 1 exerts a relatively modest influence, the interaction term (-0.000112 , $p < 0.01$) underscores a tangible amplification in the beneficial effect of ESG on cost of debt in developed markets.

Diving deeper, individual ESG pillars reveal a hierarchy in terms of their influence on borrowing costs in developed markets. The Social pillar, as seen in Model 4, emerges prominently with a coefficient of -0.000111 ($p < 0.01$) for its interaction with developed markets, suggesting that social considerations hold particular sway in diminishing borrowing costs in these regions. This could be reflective of the heightened consumer and stakeholder awareness, coupled with stringent regulatory mandates emphasizing social responsibility in developed countries. The Governance pillar, as evidenced in Model 5, also presents a pronounced negative coefficient of -0.000117 ($p < 0.01$), emphasizing the pivotal role of sound governance practices in assuaging lenders' apprehensions and thereby driving down borrowing costs.

Conversely, the Environmental pillar, while still beneficial, does not exhibit as marked an impact in developed countries as its other two counterparts, indicative of the perhaps already embedded environmental standards and expectations within these jurisdictions.

In our pursuit to understand the differential influence of firms' ESG performance on their cost of debt across varying economic landscapes, our regression findings offer compelling insights that speak directly to Hypothesis I(a) that the role of ESG performance in shaping a firm's borrowing costs would manifest differently across emerging and developed nations.

Our analysis confirms this postulation. The data illustrates that firms in developed economies inherently face higher borrowing costs. However, the silver lining emerges in the form of ESG performance. When firms in these developed economies exhibit strong ESG credentials, they significantly offset these inherent borrowing cost challenges. The influence of ESG is particularly pronounced in the realms of social responsibility and governance, with these pillars acting as potent levers to alleviate borrowing costs in developed countries. Contrastingly, the Environmental pillar's impact, while still beneficial, was not as substantial, possibly due to already stringent environmental standards prevalent in these jurisdictions.

In essence, our regression outcomes robustly corroborate Hypothesis I(a), underlining the differential prominence of ESG in influencing the cost of debt between emerging and developed countries. Firms in developed countries stand to gain markedly by prioritizing holistic ESG practices, as these not only cater to stakeholder expectations but also wield tangible financial benefits in the context of borrowing costs.

The result of Hypothesis 2

Table 10. Table 8. ESG Performance, Cost of Debt, and Economic Uncertainty Interplay

VARIABLES	(1) Model 1 ESG Combine	(2) Model 2 ESG Score	(3) Model 3 E pillar	(4) Model 4 S pillar	(5) Model 5 G pillar
ESG Combine	-0.000196*** (2.67e-05)				
<i>ESGC x WUI</i>	9.64e-05*** (3.16e-05)				
ESG Score		-0.000195*** (2.61e-05)			
<i>ESG x WUI</i>		9.30e-05*** (3.09e-05)			
E pillar			-0.000235*** (1.93e-05)		
<i>E pillar x WUI</i>			4.50e-05* (2.31e-05)		
S pillar				-0.000102*** (2.62e-05)	
<i>S pillar x WUI</i>				0.000107*** (2.62e-05)	
G pillar					4.41e-06 (2.35e-05)
<i>G pillar x WUI</i>					2.66e-07 (2.77e-05)
WUI	-0.00315** (0.00157)	-0.00307** (0.00155)	-0.000791 (0.00118)	-0.00297** (0.00131)	0.00163 (0.00157)
ROA	0.0243*** (0.00604)	0.0239*** (0.00604)	0.0161*** (0.00598)	0.0257*** (0.00605)	0.0258*** (0.00605)
IntCov	-7.77e-05*** (2.99e-06)	-7.78e-05*** (2.99e-06)	-7.74e-05*** (2.95e-06)	-7.66e-05*** (3.00e-06)	-7.61e-05*** (3.00e-06)
Lev	-0.0890*** (0.00199)	-0.0889*** (0.00199)	-0.0879*** (0.00197)	-0.0891*** (0.00200)	-0.0891*** (0.00200)
Constant	0.0809*** (0.00220)	0.0810*** (0.00219)	0.0794*** (0.00199)	0.0768*** (0.00208)	0.0724*** (0.00224)
Observations	16,532	16,532	16,532	16,532	16,532
R-squared	0.163	0.164	0.184	0.159	0.158
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses

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

Analyzing the regression results in light of Hypothesis 2 allows us to understand the nuanced interplay between firms' ESG performance, their borrowing costs, and the overarching shadows of economic uncertainty.

In the ever-evolving economic landscape of the Asia-Pacific region, the intricate relationships between firms' ESG performance, cost of debt, and global economic uncertainty manifest distinctively. This region, an amalgamation of varied socio-economic contexts and cultural backgrounds, offers a unique backdrop against which these relationships unfold.

The interaction term between the combined ESG performance and the WUI holds significance. This indicates that, on a comprehensive level, the ESG practices of firms in the Asia-Pacific region bear the influence of global economic dynamics. As the world grapples with uncertainties, firms with robust ESG standings in the region might either be viewed with enhanced favor due to their resilience and sustainable long-term approaches. On the other hand, they might also face more analysis as global investors and stakeholders place greater importance on sustainability.

Further reinforcing this narrative is the significant interaction observed between the ESG score and the WUI. This suggests that the aggregate ESG ratings of firms, which encapsulate their overall sustainability practices, resonate with global economic shifts. In the Asia-Pacific context, it becomes evident how pivotal ESG ratings have become in influencing investment decisions, credit ratings, and overall stakeholder trust, especially when set against the backdrop of global uncertainties.

Delving into the individual pillars, the Environmental pillar's interaction with the WUI, significant at the 10% level, underscores the region's varied environmental priorities and challenges. Firms must navigate a good balance in environmental stewardship amidst global economic changes. The diversity of environmental priorities across Asia-Pacific nations might cause this level of significance, with certain countries reacting more strongly to global uncertainties in their environmental practices than others.

In contrast, the Social pillar's robust interaction with the WUI, significant at the 1% level, puts the spotlight on the region's diverse cultures and values. This emphasizes that the social imperatives of Asia-Pacific firms, from employee welfare to community engagements, are acutely attuned to global economic fluctuations. The cultural richness of the region amplifies the impact of these global pressures, dictating the social directives of its businesses.

However, the Governance pillar stands apart, not exhibiting a significant interaction with the WUI. This can be attributed to the region's diverse corporate governance traditions, structures, and regulations. Global economic uncertainties might not consistently influence the governance practices of firms in the Asia-Pacific, as these practices are deeply rooted in the corporate traditions and regional structures.

To recap the regression results in short, the Asia-Pacific landscape illustrates a complex connection of the interplay between ESG components, cost of debt, and the moderating impact of global economic uncertainty. Each ESG pillar mirrors the region's distinctive dynamics, and the overarching interactions with the WUI capture the broader narrative of how global pressures shape sustainability practices and their financial implications in this part of the world.

CONCLUSION

In a conscious effort to dive deep into the intricate relationship between ESG performance and borrowing costs, especially within the Asia-Pacific region, this research accentuated the tangible financial implications of ESG metrics in the domain of borrowing. The findings, rooted in a comprehensive dataset underscores the three pivotal contributions our research sought to make.

Firstly, by navigating the interplay between ESG performance and borrowing costs, we validate Hypothesis I by showcasing a significant inverse relationship between ESG metrics and cost of debt. Notably, a detailed exploration of the three ESG pillars—Environmental, Social, and Governance—highlighted the nuanced impacts of each, with the environmental domain emerging strongly, emphasizing the growing importance of environmental consciousness in the current financial context.

Secondly, after venturing into the contrasting influences of ESG metrics across developed and emerging economies, our results for Hypothesis I(a) were revealing. While borrowing costs inherently appeared higher for firms in developed economies, robust ESG credentials significantly mitigated these costs, especially in the realms of social responsibility (S Pillar) and governance (G Pillar). The lesser impact of the Environmental pillar in these economies possibly indicates pre-existing rigorous environmental standards. This differential influence underscores the importance of understanding regional variances when considering the relationship between ESG-borrowing cost relationship.

Lastly, our evaluation of Hypothesis II emphasizes the pronounced role of world economic uncertainty, as represented by the WUI, within the Asia-Pacific framework. While prior European-based studies have highlighted the distinct influence of WUI in determining the cost of debt, a similar pattern emerges within the Asia-Pacific landscape. The region's unique blend of economic structures and cultural intricacies amplifies the effects of global uncertainties, thereby underscoring the importance of WUI. Delving deeper into individual pillars, it becomes evident that a nuanced understanding is required. As such, it's crucial to perceive this uncertainty not merely as a generic factor, but as a variable deeply woven into the fabric of regional dynamics.

In light of these findings, implications for stakeholders in the financial landscape are numerous. For investors and lenders, understanding the pronounced effects of ESG on borrowing costs underscores the importance of integrating ESG considerations into lending practices and credit risk assessments. This research provides empirical evidence that can guide investment and lending strategies, highlighting the financial value of ESG performance, especially in diverse economies of the Asia-Pacific region. For firms, the insights from this study signal a strategic avenue to optimize cost of debt through enhanced ESG practices, further emphasizing the business case for sustainability and good governance. Regulators and policymakers, too, can harness these findings to foster a more sustainable and financially resilient corporate environment. The tangible benefits of ESG practices, as evidenced by this research,

emphasize the need for continued dialogue, collaborative action, and nuanced policymaking tailored to regional specificities. As the global call for sustainable business practices grows louder, the learnings from this study offer a timely compass, guiding the alignment of ESG imperatives with core financial outcomes.

RECOMMENDATIONS FOR FUTURE RESEARCH

1. For a more in-depth look, future studies may benefit from employing a quasi-experimental design, such as, a difference-in-differences (DiD) approach. This would allow a deeper analysis of how different ESG profiles in firms affect borrowing costs, especially in response to economic events or policy changes.
2. While the World Uncertainty Index (WUI) gives a general view, there are other global uncertainty indices that could potentially offer new insights. Consider, for instance, the Economic Policy Uncertainty (EPU) index or the Global Economic Uncertainty (GEU) index. Rooted in distinct methodological foundations, these indices may unveil different perspectives that the WUI in this paper might not capture.
3. The scope of this research might be expanded to consider the potential influence of country-specific factors, particularly varying ESG regulations, on the ESG-cost of debt dynamic. While the current study integrates country-fixed effects to account for national-level variations, the focus on regulatory environments could enhance the comprehension of how governance frameworks shape this dynamic. As these factors are outside the scope of the present study, they offer a valuable opportunity for further research.
4. It is recommended that subsequent studies focus on distinguishing the direct effects of ESG practices on the cost of debt from other possible influencing factors. This study has controlled for a variety of variables. However, the potential for additional, unobserved influences remains. Given the time and data limitations in the present study, this important area is suggested for further exploration.

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