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THE IMPACT OF MSCI ESG RATINGS ON STOCK MARKET BETA: A CASE STUDY OF DEVELOPED AND EMERGING MARKETS

DAMPAK PERINGKAT MSCI ESG TERHADAP BETA PASAR SAHAM: STUDI KASUS PASAR SAHAM NEGARA MAJU DAN NEGARA BERKEMBANG

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ABSTRACT

This study examines the impact of MSCI's Environmental, Social, and Governance (ESG) ratings on stock market beta among publicly listed companies in developed and emerging markets. Utilizing a quantitative research design, data from 459 companies across 11 sectors were analyzed, incorporating the latest five MSCI ESG ratings and corresponding five-year beta coefficients as measures of stock beta or systemic risk. Descriptive statistics and correlation analyses were conducted to assess the relationship between ESG ratings and stock market beta. The findings reveal that while companies in developed markets have higher average ESG ratings compared to those in emerging markets, they also exhibit greater stock beta. Sector analysis indicates that industries such as Real Estate and Financials demonstrate strong ESG performance and lower stock beta, whereas sectors like Materials and Health Care show higher volatility regardless of their ESG ratings. Correlation analysis shows a very weak relationship between ESG ratings and stock beta, suggesting that ESG ratings are not strong predictors of stock market beta. In conclusion, the study finds that ESG ratings alone do not significantly impact stock market beta. It recommends that investors integrate ESG considerations with traditional financial analysis for better investment decisions. Companies should continue to enhance their ESG practices for sustainability and reputational benefits, even if it does not directly reduce stock beta. Policymakers, particularly in emerging markets, might focus on strengthening ESG frameworks to support sustainable investment environments.

Keywords: *MSCI ESG ratings, Stock market beta, Developed markets, Emerging markets, Quantitative analysis.*

ABSTRAK

Penelitian ini mengkaji dampak peringkat Environmental, Social, and Governance (ESG) dari MSCI terhadap volatilitas pasar saham di antara perusahaan publik di pasar maju dan berkembang. Menggunakan desain penelitian kuantitatif, data dari 459 perusahaan di 11 sektor dianalisis, dengan memasukkan lima peringkat ESG MSCI terbaru dan koefisien beta lima tahun sebagai ukuran volatilitas saham. Analisis statistik deskriptif dan korelasi dilakukan untuk menilai hubungan antara peringkat ESG dan volatilitas pasar saham. Temuan menunjukkan bahwa meskipun perusahaan di pasar negara maju memiliki rata-rata peringkat ESG yang lebih tinggi dibandingkan dengan di pasar berkembang, mereka juga menunjukkan volatilitas saham yang lebih besar. Analisis sektor mengindikasikan bahwa industri seperti Real Estate dan Finansial menunjukkan kinerja ESG yang kuat dan volatilitas saham yang lebih rendah, sementara sektor seperti Material dan Kesehatan menunjukkan volatilitas yang lebih tinggi terlepas dari peringkat ESG mereka. Analisis korelasi menunjukkan hubungan yang sangat lemah antara peringkat ESG dan volatilitas saham, menunjukkan bahwa peringkat ESG bukan prediktor kuat volatilitas pasar saham. Sebagai kesimpulan, studi ini menemukan bahwa peringkat ESG saja tidak secara signifikan mempengaruhi volatilitas pasar saham. Disarankan agar investor mengintegrasikan pertimbangan ESG dengan analisis keuangan tradisional untuk keputusan investasi yang lebih baik. Perusahaan harus terus meningkatkan praktik ESG mereka demi keberlanjutan dan manfaat reputasi, meskipun tidak secara langsung mengurangi volatilitas saham. Pembuat kebijakan, khususnya di pasar berkembang, dapat berfokus pada penguatan kerangka kerja ESG untuk mendukung lingkungan investasi yang berkelanjutan.

Kata Kunci: Peringkat ESG MSCI, Volatilitas pasar saham, Pasar maju, Pasar berkembang, Analisis kuantitatif.

INTRODUCTION

The integration of Environmental, Social, and Governance (ESG) factors

into investment decisions has become increasingly significant in the global financial landscape. Investors are shifting from focusing solely on short-term financial returns to considering the broader impact of their investments on society, the environment, and governance structures. This transformation is driven by the recognition that ESG factors not only reflect ethical considerations but can also significantly influence a company's long-term performance, resiliency, and risk profile (Eccles et al., 2017).

ESG ratings, provided by agencies such as MSCI, have gained substantial importance by offering critical insights into the sustainability and governance risks of companies. These ratings serve as benchmarks for assessing a company's ESG performance, guiding investment decision-making processes (Street, 2020). As the availability and quality of ESG data improve, the integration of these factors is expected to further reshape investment strategies globally.

Historically, investment decisions were predominantly based on financial metrics, with little consideration for non-financial factors. However, several high-profile corporate failures and environmental disasters have highlighted the limitations of this approach. The 2008 financial crisis, in particular, exposed significant governance failures, prompting a re-evaluation of risk assessment methodologies. This event, combined with growing environmental and social concerns, led to a shift in how investors perceive risk and long-term value. Dimson et al. (2020) expanded on this issue by pointing out that the lack of convergence among ESG ratings from different agencies further complicates investment decision-making.

According to Eccles et al. (2017), the integration of ESG factors into investment strategies has accelerated, driven by heightened awareness of global challenges such as climate change, social inequality, and corporate governance scandals. Investors are increasingly aligning their portfolios with sustainable values, leveraging ESG data to make more informed decisions that balance financial returns with positive social and environmental outcomes. The survey revealed that 62% of respondents cited fostering a long-term investment mindset as a key benefit of ESG integration.

Despite the increasing integration of ESG factors into investment strategies, there remains a significant gap in understanding the direct impact of MSCI's ESG ratings on stock market beta which compares a stock or portfolio's volatility or systematic risk to the market (Hong & Sarkar, 2010). This applies especially in developed and emerging markets. Investors are uncertain whether higher ESG ratings correlate with lower stock beta or systemic risk, which would imply a lower risk profile and influence investment decisions. This lack of clarity poses challenges for stakeholders who rely on ESG ratings to make informed decisions. ESG ratings serve as critical tools for investors seeking to identify companies that are better positioned to withstand long-term risks and capitalize on emerging opportunities. Companies with higher ESG ratings often enjoy a lower cost of capital, enhanced brand reputation, and greater access to capital markets. Conversely, those with lower ratings may face increased scrutiny, higher borrowing costs, and potential divestment (Schramade, 2016).

Complicating this issue is the phenomenon of ESG rating divergence, where different rating agencies assign varying ESG scores to the same company due to differences in methodologies, criteria, and data sources

(Berg et al., 2022). Such discrepancies can lead to confusion among investors and inconsistency in investment strategies, highlighting the need for focused research on the impact of a single, influential rating system like MSCI's. The relationship between ESG performance and stock market beta has garnered significant attention in recent years. Some studies suggest that strong ESG performance can lead to lower stock beta by improving risk management and enhancing stakeholder trust (Chen & Ying, 2023; Giese et al., 2019). For instance, Giese et al. (2019) found that companies with strong ESG profiles experience lower volatility due to improved risk management, stronger stakeholder relationships, and reduced exposure to idiosyncratic risks.

This study makes several key contributions to the literature on ESG ratings and stock market beta. While previous research, such as Giese et al. (2019) and Odell & Ali (2016), has explored the relationship between ESG performance and stock beta in developed markets, this paper specifically investigates Indonesia, an emerging market with less mature ESG frameworks. This fills a significant gap in the literature by providing empirical evidence from a developing economy, where ESG ratings may have a different impact compared to more established markets (Volodina & Trachenko, 2023). For investors, the study offers insights into how ESG ratings can be used to manage portfolio risk and improve diversification strategies in the context of emerging markets, where ESG factors often exhibit higher volatility (Gupta & Chaudhary, 2023). For listed firms, the findings suggest that improving ESG performance may help stabilize stock prices and enhance investor confidence, as stronger governance and transparency are often associated with reduced volatility (Chen & Ying, 2023). Furthermore, the paper contributes to the academic literature by testing the applicability of ESG ratings in regions where such integration is still in the early stages (Renneboog et al., 2008), offering valuable insights for policymakers and corporate managers in Indonesia and similar emerging markets.

Other studies indicate that the impact of ESG on volatility varies across regions and industries. Auer & Schuhmacher (2016) showed that ESG investments in the U.S. and Asia-Pacific perform comparably to conventional portfolios, but those in Europe often underperform with higher volatility. Gupta & Chaudhary (2023) noted that while ESG portfolios in developed markets show reduced volatility and better risk-adjusted returns, those in emerging markets exhibit higher volatility. These conflicting findings suggest that while ESG integration can enhance stability in some markets, its impact on stock beta is not uniform. Factors such as geographic region, industry type, and market maturity play significant roles in determining how ESG performance influences volatility. Moreover, inconsistencies in ESG ratings from different agencies further complicate the relationship between ESG and stock performance (Berg et al., 2022; Dorfleitner et al., 2015).

By concentrating exclusively on MSCI's ESG ratings, this study aims to mitigate the confusion caused by rating discrepancies across agencies and provide a clearer understanding of their specific impact on stock market beta. Focusing on a single rating system allows for a standardized analysis of how ESG factors influence investment risk and performance.

This study examines the impact of MSCI's ESG ratings on stock market beta by addressing three main questions.

First, it looks at how ESG ratings have changed over the last five MSCI rating issuances, to determine whether companies are improving or declining in their sustainability practices. Second, it explores how fluctuations in ESG ratings affect stock market beta in both developed and emerging markets, assessing whether changes in ESG ratings influence stock price volatility. Third, it investigates the correlation between a company's current ESG rating and its stock beta, to see if a direct relationship exists between the two. The study's objectives are to analyze trends in ESG ratings over the last five issuances, to assess the link between ESG rating volatility and stock beta in different market types, and to identify the relationship between current ESG ratings and stock price volatility, with implications for investors and corporate strategies.

This study's theoretical framework draws on key theories to explain the relationship between ESG ratings and stock market beta. Modern Portfolio Theory (MPT) suggests that incorporating ESG factors into investment decisions helps manage non-financial risks, potentially improving portfolio stability and risk-return profiles by reducing unsystematic risk (Mangram, 2013). Signaling Theory proposes that high ESG ratings signal effective management and commitment to sustainability, which can reduce information asymmetry, boost investor confidence, and lower stock beta (Spence, 1973; Yasar et al., 2020). Additionally, Risk Management Theory emphasizes that integrating ESG factors into risk management practices helps identify and mitigate potential risks, reducing financial uncertainty and stock beta (Hopkin, 2018; Capelli et al., 2021). Together, these theories suggest that strong ESG performance can enhance market stability and lower volatility by addressing both financial and non-financial risks. The relevance of this study extends across several critical dimensions. From an investor's perspective, the research provides empirical evidence on the link between ESG ratings and stock beta, empowering investors to better assess risk and construct more resilient portfolios. Understanding this relationship can enhance investment strategies by integrating ESG factors into risk assessment models, leading to more informed decision-making and potentially improved returns.

The study analyzes 459 publicly listed companies across 11 sectors from both developed and emerging markets. By utilizing the latest five MSCI ESG ratings alongside the corresponding five-year beta coefficients to measure stock market beta, it provides a comprehensive dataset for analysis. However, the research faces certain limitations. Data constraints arise due to irregular issuance of ESG ratings and incomplete datasets, which may introduce selection bias. Some companies may have fewer ratings or missing beta values, affecting the sample size and its representativeness. Focusing exclusively on MSCI ratings may limit the generalizability of the findings. While MSCI is a prominent rating agency, concentrating solely on its ratings might not account for discrepancies or differing methodologies used by other agencies, which could influence the interpretation of ESG impacts. Differences in regulatory environments, cultural attitudes toward ESG factors, and investor behaviours between developed and emerging markets may influence the results. Making market variability poses as a challenge. These factors could affect the applicability of the findings across

different contexts and limit the ability to draw universal conclusions.

Understanding the impact of MSCI's ESG ratings on stock market beta is crucial for investors, companies, and policymakers alike. By examining this relationship across both developed and emerging markets, the study aims to provide valuable insights that can enhance investment strategies, corporate governance, and regulatory policies. The findings will contribute to a more nuanced understanding of how ESG factors influence financial performance and market stability, addressing a significant gap in the current literature. This research not only advances academic knowledge but also has practical implications for integrating ESG considerations into financial decision-making processes.

RESEARCH METHODS

Research Methodology

This study adopts a quantitative research methodology to examine the impact of MSCI's ESG ratings on stock market beta volatility in both developed and emerging markets. A correlational research design was chosen to assess the relationship between ESG ratings and stock beta volatility, measured through beta coefficients. Quantitative research is well-suited for this study because it allows for objective measurement of variables, reducing potential researcher bias. Additionally, it enables the use of statistical tools to test hypotheses and determine the strength and direction of relationships, thereby providing reliable and generalizable results (Creswell, 2018). This approach allows for a clear analysis of numerical data, making it possible to identify patterns and trends across a large sample. Alternative research designs, such as qualitative methods, were deemed less appropriate for this study since they focus on subjective interpretation and are not suitable for testing relationships between numerical variables (Bell et al., 2022). A mixed-methods approach was also considered unnecessary, given the study's focus on quantifiable data.

Data Collection

The study relies on secondary data sources, gathering existing numerical data on MSCI's ESG ratings and stock market beta measures for the selected companies. Secondary data is appropriate for this research because it provides reliable, standardized information necessary for quantitative analysis (Johnston, 2014). Data on MSCI ESG ratings were obtained from the MSCI ESG Research database. The latest five ESG ratings for each company were collected, issued from year 2018 until 2024 with the ratings numerically coded from 1 (CCC) to 7 (AAA). This coding allows for quantitative analysis of ESG performance levels (MSCI, 2024). Focusing on MSCI's ratings ensures consistency and credibility in the assessment of ESG performance (MSCI, 2024).

Stock market beta data were sourced from financial databases such as Finbox Pro, Stockbit, and Yahoo Finance. Five-year beta coefficients for each company were collected, as beta is a standard measure of stock beta relative to the market. Beta coefficients are readily available and comparable across companies and markets, making them suitable for this study. Additional information on company and market classification was gathered from company financial reports, stock exchange records, and global market indices. This included data on whether companies are from developed or emerging markets, as well as their sector classifications. Collecting this information allows for the inclusion of

control variables in the analysis, enhancing the robustness of the findings.

The sample selection involved publicly listed companies from both developed and emerging markets that met specific criteria. Firstly, companies had to have at least five MSCI ESG ratings issued since 2018 until 2024. This criterion ensured a reliable time series for assessing trends and patterns in ESG impact, and companies with insufficient ESG rating data were excluded from the analysis. Secondly, companies needed to have available five-year beta values to accurately measure stock beta and systemic risk (Hong & Sarkar, 2010), allowing for a comprehensive analysis of how ESG performance correlates with market beta over a sustained period. Lastly, companies with incomplete or missing data—whether in ESG ratings or stock beta metrics—were excluded to preserve the accuracy and consistency of the analysis. The final sample comprised 459 companies, with 258 from developed markets and 201 from emerging markets, spanning 11 sectors.

Due to variations in the frequency of ESG rating issuance, where some companies may receive multiple ratings in a single year while others may experience longer gaps—the study adopted a flexible approach. It considered the latest five ESG ratings for each company, with ratings issued from 2018 until 2024. regardless of the specific dates of issuance, provided the data were not too far apart. Since ESG ratings are based on the latest available information at the time of issuance, this approach ensures that the analysis reflects the most recent ESG performance of each company. Special attention was given to aligning ESG ratings with the corresponding periods of stock beta measurement. This alignment ensures that the relationship between a company's ESG performance and its stock beta is measured as accurately as possible, even when rating intervals are irregular.

Data Analysis Method

The data analysis involved several steps to provide a comprehensive understanding of the relationship between ESG ratings and stock market volatility. The study utilizes a correlational research approach, which examines the extent to which two or more variables are related (Sekaran & Bougie, 2016).

To facilitate comparisons between developed and emerging markets, the dataset was segmented based on market classification. The first segment, the whole market, includes all companies irrespective of their market classification, providing a broad overview of trends and relationships. The second segment focuses on developed markets, comprising companies from economies with mature financial systems and higher regulatory standards. Lastly, the emerging markets segment includes companies from economies with developing financial and regulatory environments, allowing for a nuanced analysis of differences in ESG impacts across varying market contexts.

Descriptive Statistics

Descriptive statistics, including mean, median, mode, and standard deviation, were calculated for both the ESG ratings and stock beta values. This provided an overview of the data distribution across the five latest ESG rating periods:

1. Mean: Represented the average ESG rating and stock beta.
2. Median: Showed the middle value for ESG ratings and stock beta, highlighting central tendency.

3. Mode: Identified the most frequently occurring ESG rating and beta value, offering insight into common patterns.
4. Standard Deviation: Measured the variability of ESG ratings and stock beta values, indicating the extent of volatility.

Correlation Analysis

To assess the strength of the relationship between ESG ratings and stock beta, Pearson's correlation coefficient was calculated for:

1. Total Market: Correlation across all companies.
2. Developed Markets Only: Correlation within developed market companies.
3. Emerging Markets Only: Correlation within emerging market companies.

The Pearson correlation coefficient provides insight into whether higher ESG ratings are associated with lower stock beta and whether this relationship differs between developed and emerging markets.

Statistical analyses were conducted using software tools such as Microsoft Excel and Google Sheets, which are suitable for handling large datasets and performing statistical computations.

Ethical Considerations

While utilizing secondary data minimizes certain ethical concerns, several measures were taken to maintain research integrity. First, data privacy was ensured by exclusively using publicly available information sourced from reputable databases such as MSCI's ESG Research and financial platforms like Bloomberg or Yahoo Finance. No confidential or proprietary information was accessed, ensuring compliance with data protection regulations and avoiding breaches of confidentiality. Second, data accuracy was prioritized by cross-verifying all data with multiple sources whenever possible. Rigorous data cleaning procedures were implemented to identify and address inconsistencies or errors, ensuring the research findings are based on reliable and precise information. Lastly, proper citation practices were strictly followed, with all data sources and literature appropriately acknowledged throughout the study. Adhering to academic citation standards not only respects intellectual property rights but also enhances the credibility and integrity of the research.

Limitations of the Methodology

The study acknowledges several limitations inherent in its methodology. First, reliance on secondary data may restrict the analysis to available information, potentially excluding companies with missing data. This could introduce selection bias and impact the generalizability of the findings. Second, the irregular issuance of ESG ratings presents challenges in aligning data periods precisely, which may affect the temporal accuracy of the analysis as stock beta volatility measurements might not perfectly correspond with ESG rating periods. Third, the study's correlational design does not establish causality between ESG ratings and stock beta volatility. While associations can be identified, it cannot be definitively concluded that ESG performance directly causes changes in stock beta volatility. Despite these limitations, the methodology is well-suited to address the research questions and objectives. The quantitative approach enables the examination of relationships between variables across a large sample of companies, offering valuable insights into the impact of ESG ratings on stock market beta in both developed and emerging markets.

RESULTS AND DISCUSSIONS

From Raw Company Data procured manually using MSCI ESG Ratings search function companies that fit and fulfilled the criteria then used for analysis. Here are some count analyses on the type of companies analyzed.

Sector Distribution

The distribution of companies across sectors is as follows:

1. Financials: 79 companies
2. Industrials: 63 companies
3. Materials: 63 companies
4. Consumer Discretionary: 52 companies
5. Consumer Staples: 44 companies
6. Communication Services: 34 companies
7. Health Care: 34 companies
8. Information Technology: 31 companies
9. Utilities: 28 companies
10. Energy: 20 companies
11. Real Estate: 11 companies

Country Representation

1. The companies are from the following countries:
2. Emerging Markets:
   a. India: 51 companies
   b. China: 43 companies
   c. Thailand: 17 companies
   d. Indonesia: 16 companies
   e. Mexico: 19 companies
   f. Malaysia: 15 companies
   g. South Africa: 19 companies
   h. Brazil: 21 companies
3. Developed Markets:
   a. Japan: 58 companies
   b. United States: 37 companies
   c. United Kingdom: 43 companies
   d. France: 25 companies
   e. South Korea: 21 companies
   f. Switzerland: 11 companies
   g. Australia: 36 companies
   h. Germany: 27 companies

Descriptive Statistic

Overall Market Analysis

The study encompasses a total of 459 companies eligible to be analyzed according to conditions set on this paper with data collected on their ESG ratings and stock beta coefficients. ESG transition is becoming a global megatrend, its adoption and integration into financial systems remain uneven, particularly in developing regions, where the necessary regulatory and institutional support is still evolving (Dovbiy et al., 2022). The descriptive statistics for the entire sample are summarized as follows:

Table 1. Descriptive Analysis for the Whole Market

Whole Market	5th Latest	4th Latest	3rd Latest	2nd Latest	Latest	ESG Rating Beta	Stock Beta
Mean	4.28	4.40	4.66	4.83	4.89	1.00	0.76
Median	4.00	5.00	5.00	5.00	5.00	1.00	0.73
Modus	5.00	5.00	6.00	6.00	6.00	0.00	0.52
Standard Deviation	1.5637195	1.5498125	1.5419749	1.5313912	1.5202802	1.6582402	0.4004320

The average ESG rating of 4.89 corresponds to an approximate "A" rating on MSCI's scale, reflecting strong ESG performance across the sample. The median ESG rating of 5.00 and the most frequently occurring rating (mode) of 6.00 further reinforce that the majority of companies perform well in sustainability metrics. The relatively low standard deviation of 1.52 for the latest ESG ratings suggests consistency in ESG performance among the sampled companies.

For stock beta, the mean value is 0.76, indicating that, on average, the stocks are less volatile than the market (beta < 1). This finding suggests that companies with strong ESG performance tend to exhibit lower market beta, potentially making them more attractive to risk-averse investors.

The median stock beta of 0.73 aligns closely with the mean, while the mode of 0.52 indicates that a significant subset of companies demonstrates even lower volatility. The standard deviation of 0.40 highlights moderate variability in stock beta values, suggesting some divergence in market risk profiles within the sample.

These findings collectively suggest that companies with strong ESG ratings generally align with lower market beta, supporting the hypothesis that ESG performance contributes to market stability. However, additional analysis could investigate whether this relationship holds consistently across different market classifications (developed vs. emerging) and sectors, as these factors might influence the strength of the ESG-volatility relationship. Moreover, the data could be analyzed to identify trends over time, such as whether improvements in ESG ratings correspond to a consistent reduction in stock beta values. This deeper exploration would provide more granular insights into the interplay between sustainability performance and financial stability.

Developed vs. Emerging Markets

To investigate regional variations, the data were segmented into developed and emerging markets. Table 2 provides a descriptive analysis for companies classified under emerging markets, focusing on ESG ratings and stock beta coefficients for the latest five rating periods. The findings highlight distinct characteristics of companies operating in economies with developing financial systems and regulatory environments.

Table 2. Descriptive Analysis for Emerging Companies Only

Emerging Only	5th Latest	4th Latest	3rd Latest	2nd Latest	Latest	ESG Rating Beta	Stock Beta
Mean	3.57	3.66	3.83	3.99	4.05	0.77	0.67
Median	4.00	4.00	4.00	4.00	4.00	0.76	0.63
Modus	4.00	5.00	4.00	5.00	4.00	0.00	0.63
Standard Deviation	1.54500329	1.53550116	1.54959472	1.53778286	1.53867230	1.80181516	0.38430848

The mean ESG rating for the latest period among emerging market companies is 4.05, indicating moderate sustainability performance, which is notably lower than the overall market mean of 4.89. This suggests that companies in emerging markets may lag in adopting or implementing comprehensive ESG practices. The median and mode of 4.00 reinforce the trend toward moderate ESG performance, while the consistent standard deviation of 1.54 across periods indicates moderate variability in ESG ratings, likely reflecting differences in regulatory requirements and resource availability among these companies. In terms of stock beta volatility, the mean stock beta for emerging market companies is 0.67, lower than the overall market mean of 0.76, indicating relatively less volatility despite the higher systemic risks often associated with emerging markets. This counterintuitive finding may be attributed to industries or companies less sensitive to market fluctuations. The median and mode of 0.63 further highlight the concentration of companies with low market beta, and the standard deviation of 0.38 suggests limited dispersion, indicating a relatively uniform volatility profile. These findings reveal that while emerging market companies have lower ESG ratings, they demonstrate lower stock beta values, suggesting that even moderate ESG performance can contribute to enhanced market stability. This may result from increasing investor interest in sustainability and supportive regional policies. Future research could explore the roles of specific industries, regional policy interventions, and time-series trends to better understand the evolving

relationship between ESG performance and stock beta volatility in emerging markets.

Table 3. Descriptive Analysis for Developed Companies Only

Developed Only	5th Latest	4th Latest	3rd Latest	2nd Latest	Latest	ESG Rating Beta	Stock Beta
Mean	4.84	4.97	5.31	5.49	5.55	1.18	0.83
Median	5.00	5.00	5.00	6.00	6.00	1.17	0.84
Modus	5.00	5.00	6.00	6.00	6.00	0.00	0.52
Standard Deviation	1.338 2287	1.297 7234	1.188 1550	1.157 7593	1.136 4869	1.516 9332	0.399 3862

The analysis of companies in developed markets reveals higher average ESG ratings compared to those in emerging markets, with a mean of 5.55 for the latest period, significantly above the 4.05 observed in emerging markets. This suggests that companies in developed markets generally achieve stronger sustainability performance, likely due to more stringent regulations, greater stakeholder pressure, and better access to resources for implementing ESG initiatives. The median and mode of 6.00 further highlight the prevalence of top-tier ESG performance, while the lower standard deviation of 1.13 indicates more consistent sustainability practices across these companies. Despite stronger ESG ratings, developed market companies exhibit higher average stock beta coefficients, with a mean of 0.83 compared to 0.67 in emerging markets, reflecting greater stock beta volatility. This trend may be attributed to heightened investor expectations and sensitivity to global financial dynamics in developed economies. The mode of 0.52, however, suggests that certain firms demonstrate exceptional stability, possibly linked to industry-specific factors or robust risk management practices. The divergence between high ESG ratings and increased stock beta raises questions about the influence of market dynamics, investor behavior, and sector-specific characteristics. For instance, industries like renewable energy or technology, which often perform well in ESG metrics but are inherently cyclical, may drive this trend. Further investigation into these factors could enhance understanding of the interplay between ESG performance and financial stability in developed markets, offering valuable insights for investors and policymakers.

Emerging Markets

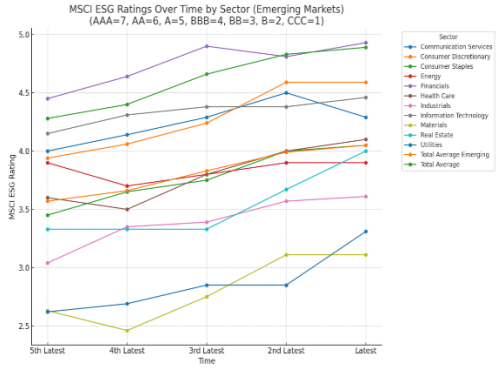

Figure 1. Average ESG Ratings Over Time by Sector (Emerging Markets)

The overall trend in ESG performance across emerging markets reveals modest improvement over the five rating periods, with the total average ESG rating increasing from 3.57 to 4.05. This progress indicates that emerging markets are gradually approaching an "A" rating (a score of 5), reflecting a steady, albeit slow, enhancement in sustainability practices. However, the pace of progress varies significantly across sectors, highlighting areas of strength as well as persistent challenges.

Among the top-performing sectors, Financials demonstrated the strongest improvement, with ESG ratings rising from 4.45 to 4.93. This performance underscores the sector's leadership in ESG integration within emerging markets, likely driven by increasing regulatory pressures and stakeholder

demands for sustainable financial practices. Similarly, the Information Technology sector exhibited consistent growth, with ratings increasing from 4.15 to 4.46. This reflects the sector's ability to innovate and adopt sustainable technologies, reinforcing its role in driving ESG advancements. Garcia et al. (2017) find that while there is a positive correlation between environmental performance and financial returns in emerging markets, it is weaker than in developed markets, potentially due to young ESG ecosystems and less mature investor awareness.

Moderately improving sectors, such as Consumer Discretionary and Communication Services, showed steady increases, reaching ESG ratings of 4.59 and 4.29, respectively. These gains may be attributed to growing consumer awareness and demand for sustainable products and services, which compel companies to enhance their ESG performance to remain competitive. Sectors like Materials and Utilities face significant challenges, as evidenced by their lower starting points and slow progress. The Materials sector improved its ESG rating from 2.63 to 3.11, while Utilities increased from 2.62 to 3.31, both reflecting substantial room for improvement. These sectors may be struggling due to the inherent environmental impacts of their operations and the complexity of transitioning to more sustainable practices. The Energy sector, however, exhibited the least improvement, with its ESG rating stagnating at 3.90 across the periods. This lack of progress highlights persistent environmental concerns and difficulties in adopting sustainable practices, particularly in industries heavily reliant on fossil fuels.

The findings reveal that while emerging markets are making strides in ESG performance, progress remains uneven across sectors. The pronounced gap between top-performing sectors, such as Financials and Information Technology, and lagging sectors, such as Materials and Utilities, indicates a leadership disparity. To achieve broader ESG improvements, targeted efforts are required in sectors like Materials and Utilities, where challenges are more complex and progress has been slower. Additionally, the stagnation in the Energy sector underscores the need for greater innovation and policy support to address entrenched environmental concerns and accelerate the transition to sustainable practices. This uneven progress highlights the importance of sector-specific strategies to close the ESG performance gap in emerging markets and drive more uniform advancements. Chang et al. (2019) note that lower transparency and inconsistent reporting standards in these regions can hinder the full integration of ESG factors, making it challenging for investors to gauge corporate sustainability accurately.

Developed Markets

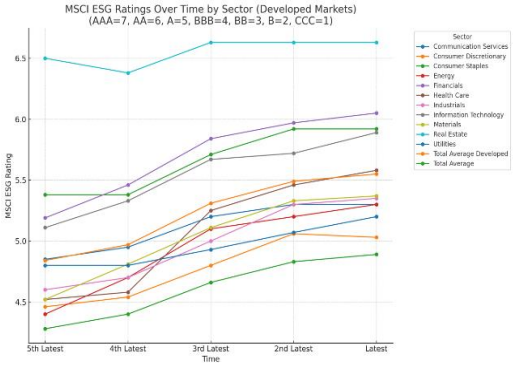

Figure 2. Average ESG Ratings Over Time by Sector (Developed Markets)

The overall trend in ESG performance for developed markets demonstrates strong improvement, with the total average ESG rating increasing from 4.84 to 5.55 over the five periods. This growth surpasses the "A" rating threshold, highlighting mature ESG integration across these economies. The

robust progress in developed markets underscores their commitment to sustainability, likely driven by stricter regulatory frameworks, greater stakeholder pressures, and advanced resources for implementing ESG practices.

Among the top-performing sectors, Real Estate stands out with exceptional ratings, increasing from 6.50 to 6.63, reaching an "AA" level. This sector exemplifies best practices in sustainability, serving as a benchmark for other industries. Similarly, the Financials sector has shown significant growth, improving from 5.19 to 6.05, reinforcing its leadership in ESG principles and commitment to market-driven sustainability efforts. The Information Technology sector continues to perform strongly, with ratings rising from 5.11 to 5.89, demonstrating the alignment between technological innovation and sustainability practices.

Moderately improving sectors, such as Consumer Staples and Health Care, also exhibited substantial gains, reaching 5.92 and 5.58, respectively. These improvements reflect the growing integration of ESG factors in consumer-related and socially focused industries. Notably, the Energy sector demonstrated significant growth, with its ESG rating increasing from 4.40 to 5.30. This progress highlights ongoing efforts to transition to cleaner energy practices, a critical step for an industry often scrutinized for its environmental impact.

Developed markets exhibit high levels of ESG integration across all sectors, with less variability in ratings compared to emerging markets. The narrower gap between sectors suggests a more uniform commitment to sustainability, with Real Estate and Financials serving as benchmarks for other industries. This widespread adoption of ESG practices enhances investment stability, offering investors more sustainable and secure options. Furthermore, companies in developed markets with strong ESG performance may gain a competitive advantage globally, leveraging their sustainability credentials to attract investors and improve market positioning.

Emerging and Developed Comparison

High ESG ratings signal to investors that a company is well-managed and sustainable, increasing investor confidence and reducing uncertainty (Spence, 1973). A comparison of total average ESG ratings over time highlights a consistent gap between emerging and developed markets. While emerging markets increased their average rating from 3.57 to 4.05, developed markets grew from 4.84 to 5.55, with the global average rising from 4.28 to 4.89. The higher rate of improvement in developed markets has widened the gap, although emerging markets show potential for convergence with continued efforts. Developed markets benefit from stricter regulatory frameworks, greater resource availability, and advanced technologies, which facilitate ESG integration. Emerging markets, on the other hand, require supportive policies and frameworks to accelerate adoption and close the performance gap.

For investors, the high ESG ratings in developed markets provide stable and sustainable investment opportunities, while the improving performance in emerging markets offers growth potential, encouraging portfolio diversification. Policymakers in emerging markets must focus on creating supportive frameworks to drive ESG adoption, leveraging lessons from developed markets. By addressing disparities in resources and regulatory

standards, emerging markets can accelerate progress and enhance their global competitiveness in sustainability practices. This convergence would not only benefit emerging markets but also contribute to a more balanced and sustainable global investment landscape.

ESG Ratings by Country

Analyzing ESG ratings over time at the country level provides valuable insights into national progress, highlighting both leaders and laggards in sustainability practices. The data reveal that developed countries generally lead in ESG performance, with some emerging economies showing notable improvements, though they still lag behind their developed counterparts. The variability in ESG performance, even within market classifications, underscores the influence of national policies, regulatory frameworks, and societal pressures.

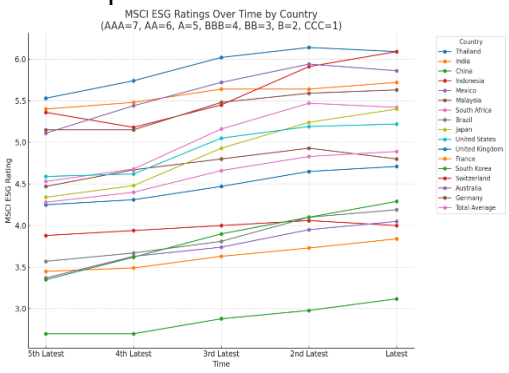

Figure 3. Average ESG Ratings Over Time by Country

1. Top-Performing Countries

The United Kingdom and Switzerland stand out as leaders, each achieving a latest ESG rating of 6.09. Their consistent improvement over the analyzed periods reflects strong national commitments to sustainability and robust regulatory environments. Similarly, Australia and France demonstrate high performance, with ratings of 5.86 and 5.72, respectively, supported by steady growth and progressive ESG policies. Germany and Japan also exhibit significant progress, with Germany's rating increasing from 5.15 to 5.63 and Japan's from 4.34 to 5.40. This growth suggests substantial efforts by these nations to integrate ESG considerations into corporate and societal practices, driven by both governmental policies and market demands. Dimson et al. (2015) demonstrate that shareholder engagements on ESG issues in developed markets yield positive abnormal returns, suggesting that ESG integration can enhance both stock stability and performance by improving transparency and operational efficiency.

2. Moderately Performing Countries

The United States and South Korea show moderate improvements in ESG performance. The United States increased its average ESG rating from 4.59 to 5.22, reflecting ongoing efforts to integrate ESG factors despite variability in state-level policies and corporate practices. South Korea, while improving from 3.35 to 4.29, indicates a growing national focus on ESG issues, though it remains behind leading developed countries. These ratings highlight an emerging commitment to sustainability, albeit at a slower pace compared to top-performing nations.

3. Countries with Lower Ratings but Improving

Some emerging economies, such as Brazil and Thailand, show incremental growth in ESG performance, with Brazil improving from 3.57 to 4.19 and Thailand from 4.25 to 4.71. These gains reflect potential for further ESG enhancements as these countries continue to develop regulatory frameworks and respond to growing global pressures. India and China,

however, exhibit lower starting points and slower progress, with India increasing from 3.45 to 3.84 and China from 2.70 to 3.12. These results indicate significant room for improvement, underscoring the need for accelerated ESG adoption, particularly given these countries' critical roles in global supply chains and environmental impacts.

4. Key Insights

Leadership in ESG performance is concentrated in developed countries, likely due to stronger regulatory frameworks, investor pressures, and societal expectations. While some emerging markets are making strides, they continue to trail developed nations, and within each market classification, variability persists. National policies and regulations play a pivotal role in shaping ESG outcomes, with countries that prioritize sustainability seeing the greatest progress. For investors, country-level ESG performance can be a critical consideration, as both current ratings and trajectories of improvement offer insights into long-term stability and growth potential. To foster global ESG adoption, emerging markets may benefit from policy support, international collaborations, and increased access to sustainable technologies and resources. This multifaceted approach could help bridge the gap between developed and emerging economies, contributing to more balanced global ESG performance.

Global Average ESG Ratings Over Time

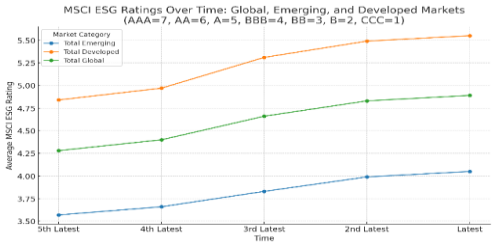

Figure 4. Global Average ESG Ratings Over Time

The analysis of global average ESG ratings over time reveals consistent improvement, with the average increasing from 4.28 to 4.89 over the five observed periods. This upward trajectory signifies a worldwide shift towards better ESG practices, with the global average nearing the "A" rating level. This convergence towards higher ratings reflects a growing emphasis on sustainability and responsible business practices across industries and regions.

The global improvement in ESG ratings can be attributed to heightened awareness of environmental, social, and governance issues and the influence of international agreements such as the Paris Agreement and the United Nations Sustainable Development Goals (SDGs). These initiatives likely encourage corporations to adopt more sustainable practices and align with global priorities for addressing climate change, social equity, and ethical governance. Such agreements not only set benchmarks but also foster accountability among nations and businesses, driving the observed positive trend in ESG performance.

This trend has significant implications for both investors and policymakers. For global investors, the overall improvement in ESG performance creates opportunities to capitalize on businesses and regions showing strong commitments to sustainability. However, regional and market-specific differences still require careful consideration to optimize investment strategies. Moreover, the trend underscores the potential for cross-border collaboration, where countries with advanced ESG practices can share knowledge and strategies with those still developing their frameworks. This collaboration could accelerate global ESG progress and foster innovation in sustainable business practices.

In conclusion, the analysis of ESG ratings over time highlights a clear global movement towards sustainability, with developed markets and high-performing sectors like Real Estate and Financials leading the way. While emerging markets are showing progress, there remains substantial room for growth, particularly in sectors facing environmental and social challenges. The positive trends underscore the importance of integrating ESG considerations into business practices to enhance corporate performance, mitigate risks, and contribute to broader societal goals. As the global average nears the "A" level, the findings demonstrate the increasing recognition of ESG integration as a critical driver of long-term value creation and sustainable development.

Analysis of ESG Ratings and Stock beta by Rating Category

The companies are categorized based on their latest ESG ratings, and the average stock beta for each category is calculated:

Table 4. MSCI ESG Rating with their Average Beta

Company	Latest MSCI ESG Rating	Count	Average Beta
AAA =	7	47	0.77
AA =	6	148	0.79
A =	5	112	0.74
BBB =	4	73	0.76
BB =	3	35	0.74
B =	2	27	0.84
CCC =	1	17	0.54

The analysis of ESG ratings and stock beta reveals unexpected patterns. Companies with the lowest ESG rating (CCC) exhibit the lowest average stock beta (0.54), contrary to the expectation that lower ESG ratings correlate with higher volatility. This may reflect industry-specific stability or already-priced risks. In contrast, B-rated companies have the highest average beta (0.84), likely due to challenges in adapting to ESG demands and heightened market uncertainty.

Companies with higher ESG ratings, such as AAA (0.77) and A (0.74), show relatively stable betas, aligning with the theory that strong ESG practices reduce unsystematic risk and enhance investor confidence. The unexpected low beta for CCC-rated firms and high beta for B-rated firms suggests the relationship between ESG performance and stock beta is not linear. Further research into sectoral or market-specific factors is needed to better understand these trends and guide investment and corporate strategies.

Sector Analysis

The average ESG ratings and stock betas for each sector are as follows:

Table 5. MSCI ESG Rating per Sector with their Average Beta

Sector	Latest	Beta
Communication Services	4.88	0.71
Consumer Discretionary	4.88	1.05
Consumer Staples	5.07	0.97
Energy	4.6	0.77
Financials	5.46	1
Health Care	5.15	1.58
Industrials	4.71	1.1
Information Technology	5.29	0.85
Materials	4.08	1.12
Real Estate	5.91	0.49
Utilities	4.32	0.72
Total Average	4.89	1

The sector analysis reveals notable variations in ESG performance and stock beta, highlighting the complex relationship between sustainability practices and market stability. Among the sectors, Real Estate leads with the

highest average ESG rating of 5.91, reflecting its strong emphasis on sustainable building practices and efficient resource management. This sector also exhibits the lowest average stock beta (0.49), suggesting a stabilizing effect of strong ESG performance on market beta. Conversely, the Materials sector has the lowest ESG rating at 4.08, likely due to inherent environmental challenges in mining and chemical industries, and exhibits higher volatility with a beta of 1.12.

Health Care stands out with the highest stock beta (1.58), indicating significant volatility despite a relatively strong ESG rating of 5.15. This may stem from regulatory uncertainties and risks associated with product development. Other sectors, such as Consumer Discretionary (beta 1.05) and Industrials (beta 1.10), also show higher volatility, likely reflecting their sensitivity to market cycles and external shocks. In contrast, sectors like Utilities (beta 0.72) and Information Technology (beta 0.85) demonstrate moderate volatility, balancing strong ESG integration with market dynamics.

General trends suggest that sectors with higher ESG ratings, such as Real Estate and Consumer Staples (ESG rating 5.07, beta 0.97), tend to exhibit lower stock beta, supporting the hypothesis that strong ESG performance contributes to market stability. Conversely, sectors with weaker ESG ratings, such as Materials, face greater volatility, highlighting the risks associated with insufficient ESG practices. These findings reinforce the value of integrating ESG considerations to mitigate market risks and enhance investor confidence.

The implications of this analysis are twofold. First, the Real Estate sector serves as a benchmark, demonstrating how robust ESG practices align with reduced risk, showcasing the potential for enhanced market stability through sustainability initiatives. Second, sectors like Health Care and Materials underscore the complexities of managing volatility, even with relatively high ESG ratings. These industries may benefit from targeted ESG strategies addressing their unique challenges, such as improving environmental impact and navigating regulatory landscapes. By tailoring ESG initiatives to sector-specific needs, industries can better balance sustainability with financial stability, ultimately contributing to more resilient markets.

Country Analysis

The average ESG ratings and stock betas for each country are presented:

Table 6. MSCI ESG Rating per Country with their Average Beta

Country	Latest Average ESG Rating	Average Stock Beta
United Kingdom	6.09	0.94
Switzerland	6.09	1.29
Australia	5.86	1.23
France	5.72	0.48
Germany	5.63	0.88
Japan	5.4	1.73
United States	5.22	1.13
South Africa	5.42	1.6
Malaysia	4.8	0.59
Thailand	4.71	0.75
Brazil	4.19	0.98
South Korea	4.29	1.39
Indonesia	4	0.24
Mexico	4.05	0.98
India	3.84	0.6
China	3.12	0.66

Detailed assessment is presented in Table 7.

Table 7. MSCI ESG Rating per Country with Insights and Implications

Country	Trend	Insight	Implication
United Kingdom	Consistent high ratings, reaching 6.09	Stable, high ESG standards with strong regulatory support	Highly attractive for ESG-focused investments
Switzerland	Gradual increase, reaching 6.09	High rating reflects strong emphasis on ESG standards	Strong option for investors seeking reliability
France	Consistently high ratings, now 5.72	Mature ESG integration, leading in Europe	Stable investment destination within Europe
Australia	Steady rise, reaching 5.86	Increasing focus on ESG, supported by recent regulations	Good choice for steady ESG returns
Germany	Upward trend, reaching 5.63	Strong commitment to sustainable practices	Reliable, sustainability-focused investments
United States	Steady increase, now 5.22	Moderate growth, slightly below top European countries	Growing commitment to ESG, some regional variations
Japan	Significant improvement to 5.40	Strong improvements, aligning with regulatory push	Increasingly attractive for stable ESG investments
South Africa	Moderate growth with fluctuations, now 5.42	Increased ESG efforts, but some challenges remain	Potential for moderate ESG-focused investments
Malaysia	Improvement, slight decline to 4.80	Upward trend, though slightly volatile	Emerging ESG market, may require monitoring
Thailand	Gradual increase, now 4.71	Positive trend with regional initiatives	Promising in Southeast Asia for ESG growth
Brazil	Moderate growth to 4.19	Growing emphasis on ESG, though challenges remain	Attractive for ESG growth in emerging markets
South Korea	Steady climb to 4.29	Consistent progress in ESG adoption	Balanced option with continued ESG progress
Mexico	Incremental increase to 4.05	Incremental growth, moderate sustainability commitment	Moderate interest for ESG in Latin America
Indonesia	Initial increase, slight decline to 4.00	Upward trend but slight decline recently	Potential for long-term ESG improvements
India	Slow growth, reaching 3.84	Gradual growth with room for improvement	Moderate ESG option within South Asia
China	Low, slow rise to 3.12	Low ESG standards, challenges with consistent practices	Caution advised; ESG still in early development
Total Average	Average rating increased to 4.89	Reflects global improvement in ESG awareness	Overall increase in global ESG standards

The country-level analysis of ESG ratings and stock beta reveals significant variations, offering insights into national-level sustainability practices and their implications for investors, policymakers, and corporations. Developed nations, including the United Kingdom, Switzerland, and France, lead with the highest ESG ratings, consistently surpassing 5.70, demonstrating robust regulatory frameworks and advanced sustainability integration. These countries provide highly attractive opportunities for ESG-conscious investors, combining strong ESG performance with stable investment environments. For instance, France stands out with a low stock beta of 0.48, suggesting reduced market beta alongside its high ESG rating of 5.72.

Conversely, stock beta variability across countries underscores the complex relationship between ESG ratings and market beta. While higher ESG ratings often correlate with lower volatility, exceptions exist. Gibson Brandon et al. (2021) show that ESG ratings in these regions are closely linked to stock performance, partly because investors actively use ESG data to assess risk. For instance, Japan, despite a solid ESG rating of 5.40, exhibits the highest stock beta (1.73), reflecting greater market beta likely tied to regulatory uncertainties and economic dynamics. Emerging markets such as Brazil and India show gradual improvements in ESG ratings, reaching 4.19 and 3.84, respectively, but remain behind developed nations, indicating substantial room for growth. These markets offer opportunities for ESG-focused investors willing to accept higher risks in exchange for potential long-term rewards.

The analysis also highlights the lack of a consistent pattern across countries regarding the relationship between ESG ratings and stock beta. Factors such as regulatory environments, market maturity, and regional economic

stability influence these variations. For example, Indonesia, which May have less stringent ESG regulations and lower levels of ESG disclosure (Chang et al., 2019) with an ESG rating of 4.00 and a remarkably low beta of 0.24, may reflect industry-specific dynamics rather than broader ESG trends. Meanwhile, China, with the lowest ESG rating (3.12), faces challenges in achieving consistent sustainability practices, suggesting the need for significant policy and corporate reforms.

For investors, developed countries with high ESG ratings and low volatility, such as France and the United Kingdom, present stable opportunities. However, emerging markets like Brazil and India offer growth potential, particularly for investors targeting ESG improvements. Policymakers in emerging markets can enhance ESG integration by strengthening regulatory frameworks and encouraging corporate transparency. Such measures could reduce volatility and attract sustainable investments. Corporations in these regions should prioritize improving ESG disclosures and practices to address information asymmetry and align with global sustainability trends.

Correlation Analysis

Here we analyze the correlation between ESG ratings and stock beta coefficients to determine the strength and direction of their relationship.

Table 8. Correlation Analysis Result

Correlation Analysis	Pearson Correlation Coefficient	Interpretation
Latest ESG Rating and Stock Beta	0.059	Very weak positive correlation; negligible association.
ESG Rating Beta and Stock Beta (Total Market)	0.0884	Very weak positive correlation; negligible association.
ESG Rating Beta and Stock Beta (Developed Markets)	-0.0377	Very weak negative correlation; negligible association.
ESG Rating Beta and Stock Beta (Emerging Markets)	0.1833	Weak positive correlation; slight association with higher volatility.

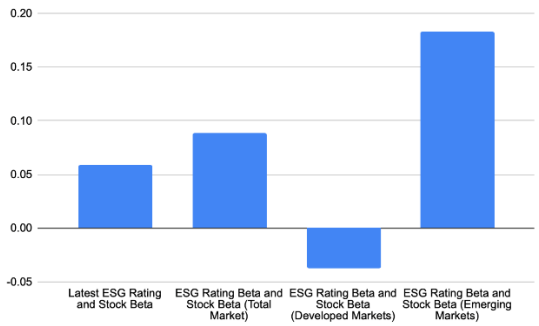

Figure 5. Pearson Correlation Coefficient Result

Correlation Between Latest ESG Rating and Stock Beta (Total Market)

The Pearson correlation coefficient between the latest ESG ratings and stock beta for the total market is 0.0590, indicating a very weak positive correlation. This suggests that higher ESG ratings are slightly associated with higher stock beta; however, the relationship is negligible and not statistically significant. The minimal strength of this correlation implies that ESG performance alone does not strongly influence stock beta across the total market, likely due to the interplay of other financial and market dynamics.

Correlation Between ESG Rating Beta and Stock Beta

The correlation coefficient between the average ESG rating over five periods (ESG Rating Beta) and stock beta for the total market is 0.0884. This reflects a very weak positive correlation, indicating that higher average ESG ratings are slightly associated with higher stock beta. Similar to the latest ESG ratings, the relationship is not statistically significant, reinforcing the

limited direct influence of ESG performance on overall market beta.

In developed markets, the correlation coefficient is -0.0377, indicating a very weak negative correlation between ESG Rating Beta and stock beta. This suggests that higher average ESG ratings are slightly associated with lower stock beta, albeit to a negligible extent. This weak negative relationship aligns with the hypothesis that strong ESG performance can reduce unsystematic risk in more mature markets, supported by robust regulatory frameworks and investor confidence in ESG practices.

In emerging markets, the correlation coefficient is 0.1833, showing a weak positive correlation between ESG Rating Beta and stock beta. This suggests that higher ESG ratings are somewhat associated with increased stock beta in these markets. The positive relationship may be influenced by the challenges of ESG integration in emerging economies, where companies often face inconsistent regulatory environments, evolving market expectations, and higher uncertainty about long-term sustainability commitments.

Interpretation of Correlation Results

The correlation coefficients across the total market, developed markets, and emerging markets reveal weak linear relationships between ESG ratings and stock beta. This indicates that ESG performance does not consistently influence stock beta across different markets. The negligible strength of these correlations highlights the complexity of the relationship and suggests that other factors, such as market dynamics, regulatory environments, and industry-specific characteristics, may play more significant roles.

The direction of the correlation varies between developed and emerging markets, emphasizing the importance of market context. In developed markets, the weak negative correlation suggests that higher ESG ratings might contribute to slightly lower stock beta. This trend could reflect the stabilizing influence of mature market structures, robust regulatory frameworks, and investor confidence in sustainable practices. Conversely, in emerging markets, the weak positive correlation indicates that higher ESG ratings are associated with greater volatility. This may stem from the challenges of integrating ESG practices in less developed regulatory environments, where inconsistencies and uncertainties can lead to higher market fluctuations. Approximately 90% of studies reported a non-negative relationship between ESG performance and CFP, with the majority indicating a positive correlation. ESG factors generally enhance profitability, operational efficiency, and stock performance (Friede et al., 2015).

These findings have important implications for investors, policymakers, and researchers. Investors should adopt region-specific strategies, leveraging the stabilizing effects of ESG ratings in developed markets while accounting for heightened risks in emerging markets. Policymakers in emerging markets should focus on strengthening regulatory frameworks and supporting companies in achieving consistent ESG integration to reduce volatility and attract sustainable investments. Further research could investigate additional factors, such as sectoral differences, economic conditions, and investor sentiment, to deepen understanding of the nuanced relationship between ESG performance and market beta.

Analysis of Findings

The findings of this study reveal a weak relationship between ESG ratings and stock market beta, indicating that ESG performance is not a strong predictor of stock beta. Across all analyses, the minimal impact of ESG ratings on stock beta suggests that other factors, such as market dynamics, industry-specific risks, and macroeconomic conditions, are likely more influential in determining stock fluctuations. This underscores the complexity of linking ESG performance to market behavior, particularly when viewed through a linear relationship like correlation.

Market Differences

The relationship between ESG ratings and stock beta varies across developed and emerging markets, reflecting differences in market maturity and regulatory environments. In developed markets, the weak negative correlation indicates that higher ESG ratings are slightly associated with lower stock beta, though the relationship is negligible. This finding suggests that the integration of ESG factors into company valuations in developed economies is mature and well-established, minimizing their incremental impact on stock behavior. Conversely, in emerging markets, a statistically significant positive correlation suggests that higher ESG ratings are associated with increased stock beta. This may reflect heightened market sensitivity to ESG developments, where investor reactions to sustainability improvements or regulatory changes amplify volatility.

Sector Variations

Sectoral differences further complicate the relationship between ESG ratings and stock beta. While certain sectors demonstrate a tendency for higher ESG ratings to correlate with lower volatility, this pattern is inconsistent. Industry-specific factors, such as the regulatory landscape, inherent risk profiles, and varying levels of ESG integration, likely contribute to this variability. For example, sectors with well-established ESG practices, such as Real Estate, show reduced volatility, while others like Health Care and Materials exhibit higher volatility due to external pressures and inherent operational risks.

Unexpected Findings

An unexpected result is the observation that companies with the lowest ESG ratings (CCC) exhibit the lowest average stock beta. This contradicts the general expectation that lower ESG performance correlates with higher volatility. This anomaly suggests that ESG ratings may not fully capture all risk factors influencing stock behavior. It is possible that CCC-rated companies operate in less volatile industries or have other stabilizing factors that mitigate market fluctuations. Alternatively, these ratings may already be reflected in stock prices, reducing market sensitivity to additional ESG-related developments.

Overall, these findings highlight the multifaceted relationship between ESG performance and stock beta. While ESG ratings provide valuable insights into sustainability practices, they are not standalone predictors of market behavior. The results emphasize the importance of considering contextual factors, including market maturity, sector dynamics, and other risk variables, when analyzing the financial implications of ESG performance. Future research could explore these complexities further, incorporating additional variables such as investor sentiment, macroeconomic trends, and long-term financial outcomes

to provide a more comprehensive understanding of the ESG-volatility nexus.

Result in Comparison Against Past Studies

The following sections compare the findings of the current study with those of previous research to contextualize the results and highlight similarities and differences in the relationship between ESG ratings and stock market beta. The results of this study both align with and diverge from previous research, reflecting the complexity of the relationship between ESG performance and financial outcomes.

The weak and non-significant overall correlation between ESG ratings and stock beta aligns with research by Benlemlih et al. (2018) and Cahan et al. (2015), which found no statistically significant relationship between corporate social responsibility (CSR) activities or disclosures and stock market beta. These studies, like the current one, suggest that ESG performance, as measured by ratings or disclosures, may not consistently or strongly impact stock beta across markets and sectors. This reinforces the notion that while ESG practices are valuable for broader corporate goals, their direct influence on market behavior is less straightforward.

Contrasting findings emerge when compared to studies like Giese et al. (2019), which reported that strong ESG profiles led to reduced stock beta due to improved risk management and reduced tail risks, particularly in developed markets. Similarly, Chen & Ying (2023) and Tang (2022) found that in China, higher ESG ratings were associated with reduced volatility, attributed to stronger corporate governance and transparency. However, the current study observes only a very weak and non-significant negative correlation in developed markets and a weak positive correlation in emerging markets. This divergence suggests that the expected relationship between higher ESG ratings and lower volatility may be less universally applicable and influenced by contextual factors.

The relationship between ESG performance and stock beta appears to vary significantly between developed and emerging markets. In emerging markets, the current study's finding of a statistically significant positive correlation aligns with Gupta & Chaudhary (2023), who noted that ESG portfolios in these regions often exhibit higher volatility and underperformance due to less mature ESG frameworks and lower corporate transparency. Conversely, Odell & Ali (2016) and Giese et al. (2019) observed more stable returns and reduced volatility in developed markets with ESG integration, which contrasts with the current study's finding of a very weak and non-significant negative correlation. This discrepancy highlights the influence of regional dynamics and market maturity on the ESG-volatility relationship.

Sector-specific factors further complicate the relationship between ESG ratings and stock beta. Auer & Schuhmacher (2016) found that the impact of ESG on performance varies by region and industry, with some European ESG investments underperforming and exhibiting higher volatility. Similarly, the current study identifies sectors like Health Care, where high ESG ratings are paired with high volatility, suggesting that industry-specific risks, such as regulatory uncertainties, may override the influence of ESG performance on volatility.

Methodological differences in ESG ratings also present challenges. Dorfleitner et al. (2017) highlighted

inconsistencies in ESG rating methodologies across agencies, leading to conflicting assessments and complicating efforts to measure ESG impacts accurately. The current study, which relies solely on MSCI's ESG ratings, encounters similar issues. For example, the finding that companies with low ESG ratings exhibit low volatility contradicts conventional expectations and may reflect limitations or biases in the rating methodology rather than a true reflection of market behavior.

The study contributes to the ongoing discourse on ESG performance and stock market beta, aligning with some prior research while diverging from others. The weak and inconsistent correlations observed suggest that ESG ratings are not strong standalone predictors of stock beta. Instead, factors such as market maturity, sector dynamics, investor behavior, and methodological differences in ESG assessments play significant roles in shaping this relationship.

These findings emphasize the importance of a holistic approach to integrating ESG considerations into investment decisions and corporate strategies. Recognizing the multifaceted nature of financial markets and the diverse factors influencing stock beta is critical for effective ESG integration. Future research should explore additional variables, such as investor sentiment, long-term financial impacts, and cross-agency ESG methodologies, to provide a more comprehensive understanding of this complex relationship.

CONCLUSION AND SUGGESTION

This study investigated the impact of MSCI's Environmental, Social, and Governance (ESG) ratings on stock market beta among 459 publicly listed companies in developed and emerging markets. Companies in developed markets had higher average ESG ratings than those in emerging markets. Despite this, developed markets exhibited greater stock beta, indicated by higher average beta coefficients.

Over time, ESG ratings improved consistently across both markets, with developed markets surpassing the "A" level on MSCI's scale. Sector analysis revealed that industries like Real Estate and Financials demonstrated strong ESG performance and lower stock beta, while sectors such as Materials and Health Care had higher volatility regardless of their ESG ratings.

Correlation analysis showed a very weak relationship between ESG ratings and stock beta. The Pearson correlation coefficients were negligible for the total market and varied slightly between developed and emerging markets. This suggests that ESG ratings are not strong predictors of stock market beta, and other factors may have a more significant influence.

Compared to previous studies, these findings both align with and differ from existing research. While some studies also found weak correlations, others reported that strong ESG performance leads to lower volatility. The unexpected result that companies with the lowest ESG ratings had the lowest stock beta indicates that ESG ratings may not fully capture all risk factors affecting stock behavior.

In conclusion, while ESG performance is improving globally, ESG ratings alone do not significantly impact stock market beta. Investors should integrate ESG considerations with traditional financial analysis for better investment decisions. Companies should continue to enhance their ESG practices for sustainability and reputational benefits, even if it doesn't directly reduce

stock beta. Policymakers, particularly in emerging markets, might focus on strengthening ESG frameworks to support sustainable investment environments. Future research could expand on these findings by including more diverse data and exploring the causal relationships between ESG performance and stock beta.

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