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Impact of ESG Disclosure on Stock Volatility and Investor Confidence during covid-19 and Russia-Ukraine conflict.

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ABSTRACT:

This thesis examines the ESG (environmental, social and governance) disclosures and how such disclosure affect the stock price fluctuation and investor confidence during COVID-19 pandemic and Russia Ukraine conflict. This thesis uses panel regression, correlation analysis and event study to test its hypotheses. Data from thirty major corporations are collected to conduct the research.

This thesis finds that higher ESG disclosure are linked with lower stock price volatility during both COVID-19 and Russia Ukraine war. Specially during pandemic this result was more stronger. Strong ESG reporting also increased investor confidence, as evidenced by increased trading activity, improved analyst ratings, and smaller price gaps between the highest and lowest prices consumers were willing to pay. This is due to the fact that these sectors are more impacted by erratic fluctuations in commodity prices and worldwide political concerns.

Investors could benefit from these findings. The result of this thesis show how ESG consideration can help investors during violent market swings. In order to mitigate the risk of price swing study show how corporate executives should report their ESG information thoroughly. The findings encourage policymakers to adopt uniform ESG reporting guidelines in order to improve market stability and transparency. Overall, this study shows that effective ESG reporting is a vital strategy for lowering risks and demonstrating a company's capacity to manage significant global challenges.

Keywords: ESG disclosure, volatility, investor confidence, crises, corporate governance, financial resilience

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1. Introduction

1.1 Background of the Study

In recent years, ESG has become one of the important aspect of investing decision. Investors have started to pay attention not only to financial health of the company but also to the environmental impact of the company. Previously traditional factors like market share, profit margin and growth were taken account for long term investment but nowadays investors while maintaining their portfolio take ESG into consideration. Because of this shift in investor decision making companies are becoming more open in matters of environmental impact, social responsibility and governance. ESG reports are therefore increasingly crucial instruments for demonstrating to the public a company's values, goals, and risk management practices (Khamisu & Paluri, 2024).

The importance of firms being transparent about their ESG policies is demonstrated by crisis circumstances. Pandemics and political unrest are examples of events that occur outside of the financial markets and raise market instability. These situations make investors begin to doubt the actual strength of a company due to the difficulties in the standard methods of risk measurement. Companies that have a reputation of being truthful, accountable, and dedicated to the environmental, social and governance principles tend to fare more favorably during times of adversity. It can result in a more secure share price and investor confidence (Smit Sven, 2025).

The COVID-19 pandemic had begun in 2020 and extended all the way through the year 2022. Then the war in Russia-Ukraine broke out in February 2022. Those two incidents actually struck the world economy and society. They shattered world supply chains in a large scale. There is also a movement of consumer patterns in spending. New policies were introduced by governments to manage markets and health concerns to the population. These days the financial setups bridge the world. Hence the Russia-Ukraine embarrassment had a wider influence than on energy rates and local trade agreements. It provoked larger economic reverberations as well as geopolitical tensions. These two crises provide important context in determining ESG reporting in turbulent times.

ESG disclosure has two main functions in case of an emergency. It may help the investors to consider the company as less risky in case the company initially shows that it is devoted to carry out business in the ethical and sustainable way. Second, it can assist business in managing any unexpected situations, which is even more proficiently demonstrated by the evidence of its stability and orientation towards the future. As a result, companies that disclose more information regarding their ESG activities will tend to experience lower fluctuations in their stock prices and maintain the confidence of their investors in the difficult circumstances in the market (ISB Online, 2025).

1.2 Purpose and Significance of Study

This paper investigates how the Environmental, Social, and Governance (ESG) disclosures were influenced by investor confidence and the volatility of stock in the COVID-19 epidemic and the Russia- Ukraine conflict. It is aimed at the presentation of empirical evidence on the reduction of financial risks and the enhancement of market trust caused by transparency and sustainability. The paper seeks to establish the extent to which ESG reporting can be used to preserve stability in uncertain and high change periods by investigating the connection between ESG transparency and the perception of businesses and market stability by investors.

This work is relevant both in theory and practice. It provides investors with important data on how the publication of ESG data may influence the management of risks and how diversified portfolios may work in case of an emergency. A good ESSG reporting by firm can help to reduce the market volatility, attract long-term investment and strengthen stakeholder trust Albuquerque et al., (2020). This research is studying two real world crises one is global health emergency and another is regional political crisis so finding of this study could become helpful for lawmaker and financial regulators to set some new standards regrading ESG disclosure.

1.3 Research Objectives

The main goals of the research include an analysis of the connection between environmental, social, and governance (ESG) disclosure and stock volatility in two major crises globally, which are the COVID-19 pandemic and the war in Russia-Ukraine. Another aim of the research is to determine the extent to which ESG disclosure helps to keep investors trust at times of uncertainty and assess whether the stabilizing effects of ESG disclosure were more important during a geopolitical conflict than during a health crisis through the analysis of the influence it had on the two events. The research will also offer useful information and directions to the corporate executives, investors and policy makers on the strategic and legal importance of ESG disclosure during crisis management.

1.4 Research Questions

In order to respond to these aims, the research answers a number of research questions. It examines the question of whether the communication of ESG information can reduce the volatility of stocks in response to international crises like the Russia-Ukraine conflict and the COVID-19 pandemic, and the effect of the ESG disclosure on investor confidence in moments of market stress. The study also investigates whether the impact of the COVID-19 pandemic was more significant than the Russia-Ukraine war on stock volatility and investor confidence and the role of ESG disclosure in influencing the decision-making and practices of investors, corporate leaders, and regulators in a real world.

1.5 Scope of the Study

Thirty multinational corporations that are included in both the S&P 500 and the STOXX Europe 600 indices are the subject of the study. The market capitalization, geographic distribution, and accessibility of ESG disclosure information were taken into consideration while choosing these businesses. The COVID-19 pandemic and the Russia-Ukraine conflict are included in the analysis, which spans the months of January 2019 through June 2025. Although ESG disclosure is the central aspect that is under research, the investor confidence and the volatility of stock prices are considered to be the primary outcomes that undergo research. Other factors like the type of industry, level of debt, ratio of returned equity and size of company are considered as control

variables. Since they are more visible to investors and are believed to release more transparent ESG information, they are only analyzed among major, publicly traded companies. This review has left out small and private firms since they take different strategies to report on environmental, social, and governance (ESG) issues and deal with investors. It may lead to variable data quality and complicate the process of results comparison. The analysis targets publicly traded companies with increased market visibility and following traditional norms of disclosure to paint a more precise image of the connection between ESG disclosure, stock movements, and trustworthiness among the investors during a crisis.

1.6 Structure of the Thesis

The thesis is structured in the following manner:

- Chapter 1: Introduction: It provides a summary of the study. This entails the background and its problem that it attempts to address. It also strikes on the primary objectives, the questions in which it seeks to answer, why it is important, and the general topic that it addresses. In addition, it discusses the overall approach to the study. It describes the reason why small and small businesses were left behind.
- Chapter 2: Literature review section studies all the relevant papers that have done similar investigation as this thesis aims to do. Past literatures are studied carefully to find the idea, motivation and research gap. It is rounded with ESG performance.
- Chapter 3: Theoretical Framework: It explains major theories which inform the study on ESG disclosure. Such concepts as Efficient Market Hypothesis are initial. Signaling Theory follows. It is linked by the Stakeholder Theory.
- Chapter 4: Methodology: It describes the variables of the study. Data sources get detailed. Methods of research have been discussed. The process of sample selection is explained. It is enclosed by data analysis procedures.
- Chapter 5: Data Analysis and Results: Descriptive statistics are enclosed in this chapter. Regression and correlation analysis are present. This section also includes reliability tests.

- Chapter 6: Discussion: It describes the findings in simple words. The latter are compared with the data on previous crises. The theoretical and practical implications of the findings are discussed.
- Chapter 7: Conclusion and Suggestions: It summarizes the key findings. The study's applicability gets explained. Recommendations for further research finish it off.

2. Literature Review

2.1 ESG and Corporate Financial Outcomes

The issue of incorporation of environmental, social and governance (ESG) considerations into the business decision making processes has been vital in measuring the performance of a company. Traditional financial measures such as earnings, return on equity (ROE), and stock price in the earlier days were the ultimate object of analysis on the success of a company. Nonetheless, with the increased focus on sustainability, corporate responsibility, and ethical management all over the world, these traditional perspectives are adjusted. Stakeholders, investors, and regulators have increased the need of businesses to follow the principles of ESG since it is seen as a sign of good governance, effective operations and sustainability.

It has been found out that the success of a firm in terms of finance is normally associated with its environmental, social, and governance (ESG) performance. In a broad-based study that reviewed over 200 research studies, the researchers concluded that in general, there is a positive relationship between social performance in a company known as corporate social performance or CSP and financial performance. Companies that engage in social responsibility will find the cost of capital reduced as well as they will make more money, particularly in regard to the amount of risk involved. The companies that are actively engaged in ESG matters tend to have higher market values in both North America and Europe, where the businesses are oriented to the needs of their communities and customers (Liang & Renneboog, 2017).

G in ESG represents corporate governance which is an important aspect in achieving financial sanity. Good corporate governance practices prevent financial hiccups and increase the efficiency with which an organization operates. These are being open and honest in the information sharing, the presence of independent boards of directors and ensuring the interests of shareholders is safeguarded. Well-managed companies tend to attract a higher number of institutional investors and use less capital (Liang & Renneboog, 2017). Nonetheless, it was reported by a study conducted by Kotsantonis et al. (2016) that weakly governed business tends to be more volatile and loses an atmosphere of trust by investors (Kotsantonis et al., 2016).

Financial results are also influenced by the social and environmental concerns, albeit in varied measures. Some of the ways of showing environmental responsibility are by reducing carbon emissions, conserving resources, maintaining sustainable supply chains, among others. Such processes not only minimize the operating costs but help prevent regulatory and reputational problems. Social responsibility would include fair labor standards and community service, which are some of the ways that can add value to a brand, consumer loyalty, and employee productivity. According to Fatemi et al. (2018), all these factors work together to enhance the resilience of a business, especially in industries where labor market is highly competitive or where environmental laws are highly enforced.

Profitability and sustainability can co-exist, as demonstrated by the growing number of companies that are taking sustainability into account in their corporate plans. The firms that focus on those ESG issues that are most relevant in the industry usually perform better than their competitors in financial reporting and market value, assert Khan, Serafeim, and Yoon (2016). One should keep in mind that the firms, which excel in ESG categories, which are not related to their core risks, may not achieve comparable financial returns.

Despite a lot of controversy, evidence has been increasing that empirical studies have shown positive association between ESG performance and financial performance. Companies that do well on important ESG concerns related to their business, for instance, typically have superior stock performance. Businesses that provide consumer goods benefit from ethical and environmental practices because they increase brand strength and client loyalty. However, because they want to lower risks and adhere to regulations, companies that utilize a lot of resources, such as mining and oil and gas, benefit financially more from focusing on environmental ESG elements (Hu et al., 2022). After studying these paper it can be understood that although there is generally positive relationship between ESG and financial performance the nature of this relationship depends on sector, type of ESG and what kind of business firm is involved with.

2.2 ESG and Market Reactions During Crises

ESG is perceived as cushion for company during market crisis so to observe their effect is perfect during the period of crisis. When financial market is facing some unexpected shocks investors seek clear signals that firms are able to manage risks and maintain their operations. Companies can demonstrate their commitment to sustainability, moral behavior, and long-term planning by making ESG disclosures (Shribman, 2024).

One significant global issue that affected economies, supply networks, and labor markets worldwide was the COVID-19 pandemic. Chinese companies found that companies having higher ESG ratings experienced fewer fluctuations in their stock prices in this time (Xu et al., 2020). This means that the investors have a belief that businesses having strong ESG policies are more effectively managed and better placed to address unpredictable challenges. Disclosure of ESG information thus assists business to protect itself against sudden and drastic market downturns.

The COVID-19 epidemic was a severe worldwide issue that impacted the economy, global supply chains, and the labor market. Chinese firms found that during this time, the volatility of the stock prices was less prevalent amongst those firms having larger ESG rating. It means that investors consider companies that possess a strong ESG as well-managed and able to be resilient to all unexpected challenges. Consequently, trading ESG information assists companies to mitigate against sudden and drastic market plunges.

The same sort of market turbulence was caused by the Russian Ukrainian conflict, which began in February 2022 and was dominated by the oil, financial, and industrial sectors. Companies that were publicly open about their ESG programs were more successful in these market changes (Tsang et al., 2023). Companies that did not keep their social and environmental programs private, were perceived as more trustworthy and responsible, and this contributed to preventing the sudden drops in valuation and immediate sales.

The crisis in the international markets proves the importance of ESG during the period of crisis. The European businesses who had a high ESG performance had reduced stock price decreases during the epidemic, compared to other firms that had poor ESG policies. The ESG-oriented funds in the US performed well as compared to typical funds, where money was flowing out of them. It

means that when uncertainty prevails, showing ESG transparency will build confidence, and bring in capital by risk-averse investors.

The investors perception and consideration towards businesses is what releases the effect of the ESG during a crisis. A company that reveals more information concerning its ESG practices is more transparent, the leadership of such a company is more competent, and the knowledge gap between the company and investors is narrowed. Such factors enhance the confidence of investors in the ethical nature of the company and its capacity to handle the tough situations. The behavioral finance suggests that investors become more cautious and prefer to invest in companies that are genuinely concerned about the environmental, social, and governance (ESG) issues at times of troubles. Consequently, companies with high ESG scores generally have the confidence of their investors and there are reduced stock prices fluctuation (Shivangi, 2024).

An analysis of various sectors demonstrates that the effects of ESG on businesses are different. As the investors are more concerned with governance, innovation, and brand reputation, tech and consumer goods businesses will reap greater benefits of revealing ESG information during crisis periods. Meanwhile, ESG is mostly beneficial to industrial and energy industries due to strict regulations and heightened risks in operation. Such differences indicate the importance of focusing on the most important aspects in terms of ESG reporting as not every ESG factor has such a large role in every business (Bagh et al., 2024).

2.3 ESG and Investor Confidence

Investor confidence refers to the extent to which investors trust in the management of a company, its sustainability in the long run as well as its transparency and truthfulness. Such a trust can be of considerable effect in the stability of the market, the selection of the investor, and nature of investments that an investor opts to make during periods of economic turmoil. Considering that ESG disclosure provides investors with a reliable and clearer view of sustainability efforts, risk management, and governance of a company, it is a factor that leads to trust (Governance, 2023).

Institutional investors are increasingly incorporating the ESG factors into their investment plans. According to Krueger, Sautner, and Starks (2020), investors spend a lot of time analyzing ESG information to understand whether a company is likely to become strong and reduce their

chances of facing problems related to the activity or image of the company in challenging periods (Wang, 2025). The duration of investing plans is promoted, and the confidence of the investors is enhanced by the disclosure of ESG information.

Investor confidence can be determined by signals like analyst ratings, trading, the disparity between buy and sell prices, and so on. Smaller price changes, increased trading, and better changes in analyst action are indicators of confidence and a more reliable market, especially to companies that report high ESG data. Conversely, less robust ESG policies have a higher chance of affecting businesses since more uncertainty leads to the increase in perceived risks and price fluctuations.

As postulated in the behavioral finance theory, improved ESG disclosure allows the investors to make more rational decisions in challenging situations. When they are confronted with uncertainty, investors are likely to be carried along by the herd, panic sell or overreact. When ESG data are provided in clear form as a real evidence of responsible management, the usage of mental shortcuts is reduced, and the behavior of investors is also more stable. For long-term investors seeking durable possibilities and higher returns after weighing the risks, this influence is especially significant.

ESG disclosure has an impact on investors' faith in a company since it demonstrates how well it can manage significant risks. Businesses that actively address environmental concerns, adhere to strict labour regulations, and have open and transparent administration are thought to be better equipped to handle emergencies. In addition to fostering investor trust and lowering the likelihood of abrupt share sales, this view helps maintain more stable stock values.

2.4 ESG as a Risk-Mitigation Tool

Through intentional risk reduction, ESG disclosure assists businesses in managing many risks, including financial, reputational, and operational risks. Early warning indicators of problems including resource scarcity, climate change threats, and possible regulatory fines can be found in environmental disclosures. Human resource risks, employee relations management, and consumer expectations are all included in social disclosures. In order to lower the possibility of

conflicts of interest, governance disclosures demonstrate how successfully the board is running the firm, how moral judgements are made, and how transparent the organization is.

In times of crisis, the value of ESG in risk management becomes evident. The COVID-19 pandemic revealed flaws in how businesses treat their employees, plan for crises, and oversee international supply chains. Strong ESG reporting helped businesses exceed stakeholder expectations, demonstrate stability, and keep investors' trust. Russia against Ukraine also showed the unpredictable nature of the energy markets and geopolitical tensions. Those companies that consistently reported their ESG performance stood in a better place to deal with these challenges and hence they did not undergo massive price changes and panic in the market.

The idea that ESG practices reduce risk is proven by a number of studies. The firms that had the highest ESG scores in the market recovered their market volatility faster and experienced fewer drops in their values in challenging periods as compared to firms with lower ESG scores. The exceptional results and higher contributions in ESG oriented funds in case of COVID-19 epidemic illustrate how the ESG reporting can similarly assist enterprises and investors to view risk management in a better light (Chen et al., 2023).

2.5 Limitations of Existing ESG Research

Despite the fact that ESG research is growing, there are still some restrictions. Businesses and nations may not be easily compared due to the existence of various methods of quantifying ESG practiced by various data providers. The results of such different approaches are harder to compare between businesses or geographical locations due to such different methods, which results in inconsistencies. The other problem is that the majority of studies are done on developed markets leaving the emerging areas with less information and concerns. The over availability of results is constrained because of the regional differences in ESG practices, expectations on the part of investors, and regulations. Moreover, several researches overlook long-term performance after a crisis in lieu of concentrating their attention more on the short-term market responses.

Lastly, establishing the actual cause and effect relationship may be difficult due to the fact that financially prosperous organizations publish more ESG information. These disadvantages provide

the need of this study, which examines the confidence of investors and volatility in the various crises to gain a better insight into the impacts of ESG. As a way of getting the correct results, robust control variables are employed.

2.6 Hypotheses Development

As per the existing studies, the following hypothesis are put forward:

H1: Higher ESG disclosure was associated with lower stock volatility during the COVID-19 pandemic.

H2: Increased ESG disclosure was also linked to lower stock volatility during the Russia-Ukraine conflict.

H3: Increased ESG disclosure enhances investor confidence, improves market liquidity and reduces the spread of bid-ask.

H4: Greater ESG disclosure boosts investor and analyst confidence, resulting in more frequent and positive analyst earnings revisions.

H5: Compared to the COVID-19 pandemic, the impact of ESG disclosure on lowering volatility was greater during the Russia-Ukraine conflict.

3. Theoretical Framework

3.1 Introduction

The theoretical approach simplifies the understanding of the effect of ESG disclosure on market volatility and investor confidence, especially during a crisis. This chapter explains the benefits of disclosing ESG to companies and their impact on financial markets in three related concepts which are Efficient market hypothesis, Signaling theory, and the stakeholder theory. The chapter presents an empirical research analysis conceptual framework through the introduction of ESG disclosure in the theories, and it can be used to assess the significance of different variables related to the study.

3.2 Stakeholder Theory

3.2.1 Overview of Stakeholder Theory

The Stakeholder Theory, which Freeman formulated in 1984, holds that performance of a firm is based on how well the company can manage its relationship with a diverse range of stakeholders, not only stockholders (Freeman & Mcvea, 2001). Some examples of stakeholders include the customers, suppliers, workers, communities, investors and government regulators. When an organization manages to address the needs and requirements of these stakeholders, it is likely to prosper and stay afloat throughout the long run. Freeman also says that focusing on shareholders only disregards the complex relationships that characterize the contemporary business environment.

This thesis also argues that a company has ethical, social, as well as environmental responsibilities besides financial responsibilities. Through ESG reporting, companies can show the way they are responding to the concerns raised by the stakeholders. Corporations show their readiness to deal correctly with the interests of all of their stakeholders by being open to their leadership approaches, social responsibility programs, and environmental impact.

3.2.2 ESG Disclosure and Stakeholder Engagement

ESG disclosure can help companies to reach multiple stakeholders simultaneously. ESG reports provide the investors with the information on the risk management, ethical governance, and long-term value creation. Openness of the policies and labor practices in the workplace have the effect of motivating and inspiring employees with trust which may boost output. Customers are also moving towards firms that act ethically and sustainably and, therefore, ESG reporting is a key pointer that defines the responsibility of a business and its commitment to its image. ESG data also help legislators and regulators to understand whether businesses are operating within the regulations and identify any more severe issues.

Good relations between the business and the stakeholders are very important in the moment of crisis, the COVID-19 pandemic and the war between Russia and Ukraine proved that. When there is a great amount of uncertainty, people depend on reliable and unambiguous information more. Those that have a strong ESG are seen to be risk managers to all stakeholders, not only the shareholders. As an example, companies were regarded as being more reliable and responsible when they kept their chains of supply, provided safety to their workers, and assisted communities during the pandemic. Such perception can be used to keep the investors confident, stabilize the prices, and reduce panic selling based on fear (Ming et al., 2021).

3.2.3 Empirical Evidence Linking Stakeholder Theory to ESG

Numerous studies exist that give support to using Stakeholder Theory to ESG and financial performance. stakeholder-oriented organizations have better chances of being profitable (Orlitzky & Swanson, 2008). This is owing to the fact that the organizations that excel in social circumstances also excel in financial terms. During hard periods, investors would have a higher tendency to trust companies that offer quality information on ESG (Fatemi, A., Glaum, M., & Kaiser, 2018). As Broadstock et al. (2021) reported, strong ESG engagement corresponded to reduced changes in stock prices during the COVID-19 pandemic, which is attributed to stakeholder emphasis being a type of resilience (Broadstock et al., 2021).

3.2.4 Mechanisms of Stakeholder Influence

The extent to which the stakeholders are involved in the environmental, social, and governance (ESG) disclosures is interrelated in more than one way with financial outcomes. Through taking the initiative to resolve environmental and social problems, business can reduce the risk it has on its operations, image and regulations. The establishment of better relationships with the stakeholders by open and transparent ESG practices will increase investor, employee, and customer loyalty and confidence. Companies that put the needs of their stakeholders first portray a long-term plan of approach, which enhances their ability to deal with change and crisis. Moreover, when a firm shows that it has ethical leaders and manages resources in a sustainable way, good ESG reporting creates a better reputation of the company to the market, and attracts long term investors. Consequently, the Stakeholder Theory explains why companies that have established ESG reporting are less prone to fluctuations in the stock price and have more confidence in investors during a challenging period.

3.3 Signaling Theory

3.3.1 Overview of Signaling Theory

Spence developed the Signaling Theory in 1973 and explained the way in which those who are more informed can reach out to the less informed. In terms of the activities, risks, and goals of a firm, the managers are much more versed than the financial markets investors. The ESG disclosure shows the commitment of a company to sustainability, risk management, and good governance. Through this, there would be a reduction in the information asymmetry between the business and its investors.

According to the theory, the credibility of a signal depends on both the cost of transmitting a signal and the cost of detecting a signal. ESG reporting is time-consuming and involves financial resources in gathering and auditing data and dissemination of information. When a company decides to do this, it shows that they have a sense of sustainability and are willing to overcome challenges. Investors then translate these actions to mean that the business is less risky and has space to grow in the long term (Connelly et al., 2011).

3.3.2 ESG Disclosure as a Signal

With ESG disclosure, the market is provided with various signals that together increase the valuation of a company and can affect the perception of the investor on it. As the businesses are considered more effective in risks management and maintaining the stability in difficult circumstances, the high ESG performance shows financial stability through reducing the chances of any sudden increase and decrease in stocks (Dobrick et al., 2025). Environmental and social efforts also show the efficiency of the business as they focus on resource efficiency, innovation and running the business well. Moreover, the best governance disclosures also feature ethical leadership, accountability, and openness, which prove that the business is consistent with the interests of its stakeholders. When put together, such indicators enhance confidence in the market and make the business an acceptable and long-term investment choice (Reber et al., 2022).

For instance, during the COVID-19 epidemic, companies who disclosed information about their remote work arrangements, community support programs, and employee safety policies were viewed as robust and ready (Atstaja et al., 2021). During the Russia-Ukraine crisis, companies that disclosed information about their governance structures, energy savings, and supply chain risk management gave investors greater peace of mind (Khamisu & Paluri, 2024).

3.3.3 Empirical Evidence Supporting Signaling

Studies show that when firms disclose their ESG information actively investors perception about the company is generally positive and optimistic. Leite & Uysal, 2023 reports that Companies with higher ESG reporting fluctuates less and draws more steady investment than companies that doesn’t disclose their ESG information actively. Empirical evidence shows that firms with stronger ESG performance generates higher returns and lower volatility during crises Albuquerque et al. (2020). Meanwhile transparency in ESG reporting leads to improved financial performance and investor confidence (Agbakwuru et al., 2024).

3.3.4 Mechanisms Linking ESG Signaling to Market Outcomes

Signaling theory states that detailed and credible ESG disclosure can be an important tool that can influence company's financial outcomes by showing investors that the firm is capable of managing risks and pursuing long-term objectives. When companies are transparent about their ESG information it shows that they are ready for potential challenges. This openness of companies leads to more trust and reduces uncertainty. Because of this investors rely on ESG information when making long term investment decisions.

3.4 Efficient Market Hypothesis (EMH)

3.4.1 Overview of EMH

Hypothesis The Efficient Market Hypothesis (EMH), which was initially written by Fama in 1970, argues that the prices of assets represent all the information that is accessible (Brown, 2020). This implies that the financial markets are information efficient. The publicly accessible ESG data must be swiftly integrated into the stock prices in such markets since investors respond to it and share price fluctuations.

EMH provides a way of understanding a correlation between ESG disclosure and market performance. The data associated with ESG affects the prices of stocks and investor choices when the data is sound, meaningful, and up-to-date. Therefore, when the market eventually becomes accommodating and effectively utilizes that information, companies that make strong ESG disclosures can experience less volatility (Horn, 2023).

3.4.2 ESG Disclosure and Market Efficiency

ESG disclosure is beneficial to the market in terms of efficiency because it helps reduce uncertainty and enhance investor knowledge. Good ESG disclosure helps a company to manage crises, measure the returns that a company takes into consideration and make more informed decisions on investments. Nevertheless, poor or insufficient ESG information may compromise the confidence of investors, heighten volatility, and lead to the price establishment being made incorrectly.

Empirical studies deliver very inconsistent yet mostly positive results. In accordance with the research carried when the COVID-19 pandemic occurred, markets reacted positively to ESG information, especially when it was essential to ESG in the course of businesses (Liu et al., 2023). These revelations gave more confidence to the investors, and that further helped to stabilize the trading and reduce major price movements.

3.4.3 Crisis-Specific Considerations

EMH is interacted with the effect of behavioral finance during crisis. Fear, uncertainty and herd mentality affect the behavior of investors, even though the overall performance of markets is efficient. ESG disclosure is capable of enhancing market efficiency through reduction of behavioral bias, provision of credible, correct, and transparent information and alignment of market prices with fundamentals. Positive ESG behaviors, such as those, experienced fewer declines at the beginning of the COVID-19 pandemic, which validates the hypothesis that markets effectively use ESG signaling to mitigate the apparent risk.

3.5 Integration of Theoretical Perspectives

EMH, Signaling Theory and Stakeholder Theory give their own arguments that are distinct but complementary, which explain the importance of ESG disclosure.

- Stakeholder Theory: The disclosure of ESG shows that a business is committed to its stakeholders hence will create resilience and stability in the long term.
- Signaling Theory: This reduces the information asymmetry and assists the investors in having a clear understanding of how the risks can be managed and how ethical governance can be upheld.
- EMH: ESG variables affect the stock’s price and may affect market volatility and investor confidence.

The integration of these perspectives proves that ESG is an ambiguous concept that consists of strategic, ethical, and informational elements.

3.6 Relevance to Crises: COVID-19 and Russia-Ukraine Conflict

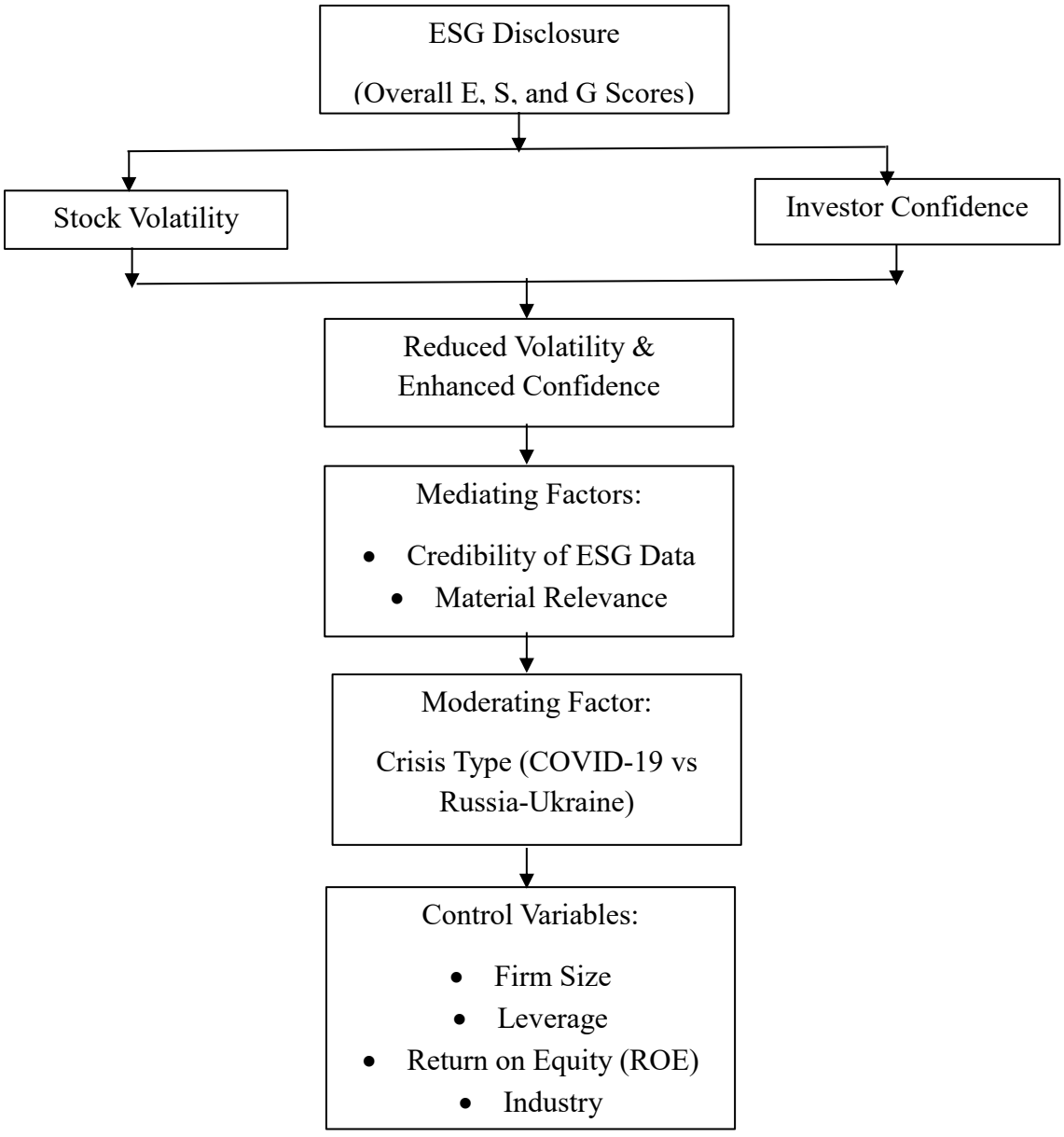
Theoretical frameworks are especially important for understanding market behavior during periods of global crisis. Two examples of ESG practices targeted at the stakeholders, which helped business to remain stable during the COVID-19 epidemic, are employee safety and community involvement. During this pandemic, there was much uncertainty, supply chain and market anxiety. The Signaling Theory shows how ESG disclosures could be used to calm down investors even though the Efficient Market Hypothesis (EMH) suggests that new information is quickly incorporated into stock prices. Governance, ethical sourcing, and environmental risks disclosures have helped to reduce the investor fear and market volatility in the Russia-Ukraine crisis, a geopolitical crisis in the region with global financial implications. Despite the difference in the effects of the similarity regarding the nature and extent of the crisis, such notions tend to incline towards the idea that the more ESG that companies disclose, the less stock price fluctuation and more confident investors.

3.7 Critique and Limitations of Theoretical Frameworks

Although the Efficient Market Hypothesis, Stakeholder Theory and Signaling Theory have a solid foundation, they all have their disadvantages. It might not be a sufficient explanation of how the market trends influence the behavior of investors, but the stakeholder theory puts much emphasis on social and ethical issues. Although Signaling Theory recommends that investors respond rationally to ESG information, this does not necessarily mean that they will always believe and fully understand it. Efficient Markets Hypothesis Emotional and biased reactions of ESG disclosures may be experienced especially during crisis situations, similar to the Efficient Market Hypothesis, which assumes the efficiency of the markets. Through these restrictions, more research needs to be conducted to comprehend the overall impact of ESG disclosures on investor trust and market instability. ESG reporting is not always effective, depending on the company and the situation, and real markets involve both irrational and rational reactions.

3.8 Conceptual Model

Figure 1. Conceptual Model



4. Methodology

4.1 Introduction

Methodology chapter explains how the research design, sample selection, data collection, measurement of the variables, and analysis procedures were applied to examine the effects of Environmental, Social, and Governance (ESG) disclosure on the stock volatility and investor confidence during the pandemic of COVID-19 (2022) and the Russia-Ukraine war (2025). This is ensured through a rigorous methodological approach that ensures that the results are solid, correct, and reliable. The six sections that compose this chapter are research design, sample selection, data collection and sources, measure of variables, analytical techniques, and robustness and validity checks. Each of the mentioned section is described below with their contribution in building theoretical framework of this thesis.

4.2 Research Design

Quantitative Research Approach

This thesis uses quantitative research approach with panel data analysis. This method is suitable because this thesis aims to investigate the stock market volatility, investor confidence and ESG disclosure over time. Quantitative analysis provides conclusions that can be generalized through intense econometric processes, unlike qualitative methods that involve focusing on impressions or stories.

The panel data fits well in this study because this type of data can be utilized to examine the time series of crisis periods and a cross-sectional analysis among enterprises. A comprehensive understanding of the impact ESG disclosure has on the behavior of the market in crisis is achieved in the study by combining cross-sectional and longitudinal data, considering both time-dependent changes and specific impacts on individual businesses.

Justification for Panel Data

In comparison to the data that only analyzes one variable at once, panel data has a series of advantages as it combines both cross-sectional and time-series factors to come up with more

comprehensive and reliable results. Further observations can be made with time and more statistical outcomes are obtained with improved precision of the statistical outcomes and efficiency of the estimations. Moreover, panel data applies such models as fixed-effects or random-effects in order to explain firm specifics such as quality of management or corporate culture that can influence investor sentiment or volatility. The examination of short-term phenomena such as the impacts of COVID-19 lockdowns and the long-term trends such as the war between Russia and Ukraine are also facilitated. The cross-sectional and time-series data enlarge the overall sample size and enhance the testability of hypotheses and strengthen the results.

4.3 Sample Selection

Population and Sampling Frame

The main target of the study consists of the big businesses which are quoted in the stock exchanges of the industrialized countries. These markets have stable regulations, stock market information, and full ESG disclosure information; hence, companies listed in the STOXX Europe 600 in Europe and S&P 500 in United States are covered.

Selection Criteria

The companies are selected using the following standards:

- ESG Data Availability: The companies are required to provide their ESG disclosure scores on a periodic basis between January 2019 and June 2025.
- Availability of Stock Market Data: Daily stock prices, returns, trading volumes, and volatility measures need to be available during the time of conducting the study.
- Sector Representation: To cover a variety of industry variances, companies are chosen from a variety of industries, such as technology, healthcare, energy, industrials, and consumer goods.
- Crisis Exposure: For the analysis to be relevant, businesses must have been significantly impacted by the COVID-19 outbreak or the Russia-Ukraine conflict.

Selected Firms

Thirty multinational corporations that regularly report on ESG aspects and represent various industries are the subject of the study:

- Microsoft Corp.
- Apple Inc.
- Alphabet Inc. (Google)
- Amazon.com Inc.
- Meta Platforms Inc.
- Tesla Inc.
- Johnson & Johnson
- Pfizer Inc.
- Procter & Gamble Co.
- Coca-Cola Co.
- ExxonMobil Corp.
- Chevron Corp.
- JPMorgan Chase & Co.
- Goldman Sachs Group
- Visa Inc.
- Siemens AG
- SAP SE
- Allianz SE

- Unilever plc
- Royal Dutch Shell plc
- BP plc
- Nestlé S.A.
- Novartis AG
- Roche Holding AG
- Nokia Corp.
- Neste Oyj
- TotalEnergies SE
- L'Oréal S.A.
- BNP Paribas S.A.
- Toyota Motor Corp.

Technology, healthcare, energy, consumer goods, industry, and finance are just a few of the important sectors that the companies in this study cover. Results that are generalizable and meaningful comparisons are made possible by this wide representation.

4.4 Data Collection and Sources

ESG Disclosure Data

Besides ESG scores on the Refinitiv Eikon, ESG databases on Yahoo Finance, there are also individual ratings of the ESG factors. Since such databases provide standardized eco-social metrics, it becomes easier to compare business and track the progress over time.

Refinitiv ESG Scores provide a more personified assessment of ESG performance and transparency based on weighted indicators which incorporate the significance of ESG variables in

each industry. The Yahoo Finance ESG Scores are used as well, and other resources are used to ensure the validity and totality of the data.

Stock Market Data

The two main factors that will be studied in the paper are stock volatility and investor confidence. They are built based on annual price data of stocks. The annual returns are calculated based on annual stock prices to determine the performance of equities and response of the market. Volatility is then calculated using the standard deviation of these annual returns that depict the level of volatility of the stock values over a period. Also considered is the volume of trade, which shows investor confidence and interest since it shows the level of loss and sale of the company shares in the market. All of the variables are based on the database of financial markets and help to comprehend the influence of ESG disclosures on stock performance and investor mood in the crisis period.

Investor Confidence Proxy

The confidence of the investor is determined in a variety of ways:

- Bid-Ask Spread: The narrow range of a spread usually means that investors are more confident.
- Analyst Revisions: This is used to show that analysts believe that the company will be a success in case they revise their expectations positively.
- Trading Volume: A high trading volume and a steady price mean that investors are active and confident about themselves.

4.5 Variable Measurement

Independent Variable: ESG Disclosure

- ESG Score (0-100): This is a single combined score, which measures the performance of a company on environmental, social and governance.

- To measure the environmental, social and governance scores separately it is easy to measure to which pillar actually drives the reduction in volatility or increase in investor confidence.

Dependent Variables

- Stock volatility: Stock volatility: Stock volatility measures how much the stock price moves around big and small market swings. This measurement of stock volatility measured with the ESG factors, which leads to see whether ESG have any impact during such market swings.
- Investor confidence: It is measured by combining different metrics such as Change in analyst ratings, trading volume, bid-ask spread. The combination of these metrics helps to capture the overall "mood" of investors toward the company.

Control Variables

- Firm size: Log of market capitalization. Log of market capitalization reduces skewness and make the relationship more linear and regression friendly.
- Leverage: It is determined by dividing total debt by total equity.
- ROE: It is measured by dividing net income by shareholder equity.
- Industry Dummies: These are the control variables that hold industrial differences constant.
- Crisis Dummies : Crisis dummies indicate whether the data falls in a crisis period or not for this thesis it is COVID-19 or the Russia-Ukraine war.

Justification for Variables, Models, and Hypothesis Testing

Above mentioned variables are selected based on the prior studies and available literature on ESG related topic. Dependent variables measures what this thesis want to explain and Independent variables are ESG scores. Control variables account for factors that could influence the dependent variables. Panel regression is used to track how the same firm changes over time when ESG or crises change. Helps to compare the difference between firms. Fixed effects control

for unobservable and time invariant firm characteristics while RE is used where appropriate it is appropriate to allow broader inference. To test the Hypothesis regressions are run separately for the COVID-period and the Russia-Ukraine war and for each The ESG coefficient is observed. Then ESG coefficient is checked for significance.

4.6 Analytical Techniques

Descriptive Statistics

The mean, median, standard deviation, minimum and maximum values for ESG scores, stock volatility, and investor confidence are only a few of the significant aspects of the dataset that are highlighted by descriptive statistics. These statistics aid in determining the distribution of the data, the locations of the majority of the data points, and the presence of any anomalous values.

Correlation Analysis

The correlation research will study the strength and direction of the association between ESG disclosure, investor faith and stock volatility. This is to check potential issues such as multicollinearity and discover an initial support of the hypothesis.

Regression Analysis

The main method used to test hypotheses is panel regression analysis. To check each hypothesis, the following models are used:

Model 1: Testing H1 (ESG and Stock Volatility)

$$\text{Volatility}_{it} = \alpha + \beta_1 \text{ESG}_{it} + \beta_2 \text{BidAsk}_{it} + \beta_3 \text{Volume}_{it} + \epsilon_{it}$$

If the coefficient β1 is both statistically significant and negative, then H1 is supported.

Model 2: Testing H2 (ESG and Market Liquidity)

$$\text{BidAsk}_{it} = \alpha + \beta_1 \text{ESG}_{it} + \beta_2 Volume_{it} + \beta_3 \text{Volatility}_{it} + \epsilon_{it}$$

If the coefficient β1 is both statistically significant and negative, then H2 is supported.

Model 3: Testing H3 (ESG and Analyst Sentiment)

$$\text{AnalystRev}_{it} = \alpha + \beta_1 \text{ESG}_{it} + \beta_2 \text{BidAsk}_{it} + \beta_3 \text{Volume}_{it} + \epsilon_{it}$$

If the coefficient β1 is positive and statistically significant, then H3 is supported.

Model 4: Testing H4 (Comparative Crisis Effects)

Model 1 will be estimated separately for COVID-19 and Russia-Ukraine crisis periods

For the periods of the COVID-19 and Russia-Ukraine crises, Model 1 will be run separately. If the coefficient β1 for the Ukraine crisis is higher than that for the COVID-19 crisis and the difference is statistically significant, then H4 is supported.

Robustness Checks

Additional tests, such as Variance Inflation Factor (VIF) tests to check for multicollinearity, using standard errors that account for heteroskedasticity, and investigating various model setups, will be carried out to guarantee the reliability of the results.

Model Selection Criteria

In panel data analysis, Hausman tests will aid in selecting between fixed-effects and random-effects models. R-squared, adjusted R-squared, and F-statistics will be used to assess how well the models fit. Common levels ($p < 0.05$ and $p < 0.01$) will be used to determine statistical significance.

Event Study Analysis

The following steps are followed in an event study method to understand how the market reacts to specific crises:

- Event Identification: Important announcements about COVID-19 lockdowns or significant developments in the Russia-Ukraine war are noted.
- Estimation of Abnormal Returns: Models that consider the market performance before an event, like the Market Model, are used to predict expected returns. By comparing the actual returns during the event period with the predicted returns, we can find out the abnormal returns.

  Market Model will be used to calculate expected returns:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

Where:

$E(R_{it})$ = Expected return for firm i on day t

R_{mt} = Market return (using relevant market index) on day t

α_i, β_i = Firm-specific parameters estimated from the estimation window

ε_{it} = Error term

Abnormal Return Calculation:

$$AR_{it} = R_{it} - E(R_{it})$$

Where:

AR_{it} = Abnormal return of firm i on day t

R_{it} = Real return of firm i on day t

To test the role of ESG disclosure in moderating market reactions:

$$CAR_i = \gamma_0 + \gamma_1 ESG_i + \gamma_2 Size_i + \gamma_3 Leverage_i + \gamma_4 ROE_i + \nu_i$$

4.7 Validity and Reliability

- Internal Validity: To make sure the results are not distorted by hidden factors the model is tested different ways such as separating the crises and adding control variables.
- External Validity: Results are useful for large companies in developed markets that report ESG in a similar way.
- Reliability: If someone else repeat the same methods used by this study same result can be expected which makes the result dependable.

4.8 Limitations of the Methodology

There are a few drawbacks to take into account, despite the method's overall strength:

- The ESG scores of different providers may differ slightly from one another.
- It is yet unclear how much of a financial impact the conflict between Russia and Ukraine will have.
- The study's proxies may not accurately reflect investor behavior.
- Even with panel regression and reliability checks, it is impossible to prove beyond a reasonable doubt that ESG disclosure leads to particular market outcomes.

5. Data Analysis and Results

The chapter contains an empirical research study, which analyzes the correlation between the quantity of information which the companies report on the issues of Environmental, Social and Governance (ESG) and two meaningful financial variables stock volatility and investor trust. The COVID-19 epidemic from 2020 to 2022 and the Russia-Ukraine conflict from 2022 to 2025 are the two significant world events covered in the report. Thirty multinational corporations that consistently reported on ESG issues over the study's research period provided panel data.

The following businesses are included of the analysis:

- Microsoft Corp. (MSFT)
- Apple Inc. (AAPL)
- Alphabet Inc. (GOOGL)
- Amazon.com Inc. (AMZN)
- Meta Platforms Inc. (META)
- Tesla Inc. (TSLA)
- Johnson & Johnson (JNJ)
- Pfizer Inc. (PFE)
- Procter & Gamble Co. (PG)
- Coca-Cola Co. (KO)
- ExxonMobil Corp. (XOM)
- Chevron Corp. (CVX)
- JPMorgan Chase & Co. (JPM)
- Goldman Sachs Group (GS)
- Visa Inc. (V)
- Siemens AG (SIEGY)
- SAP SE (SAP)
- Allianz SE (ALIZF)
- Unilever plc (UL)
- Royal Dutch Shell plc (SHEL)

- BP plc (BP)
- Nestlé S.A. (NSRGY)
- Novartis AG (NVS)
- Roche Holding AG (RHHBY)
- Nokia Corp. (NOK)
- Neste Oyj (NTOIY)
- TotalEnergies SE (TTE)
- L'Oréal S.A. (LRLCY)
- BNP Paribas S.A. (BNPQY)
- Toyota Motor Corp. (TM)

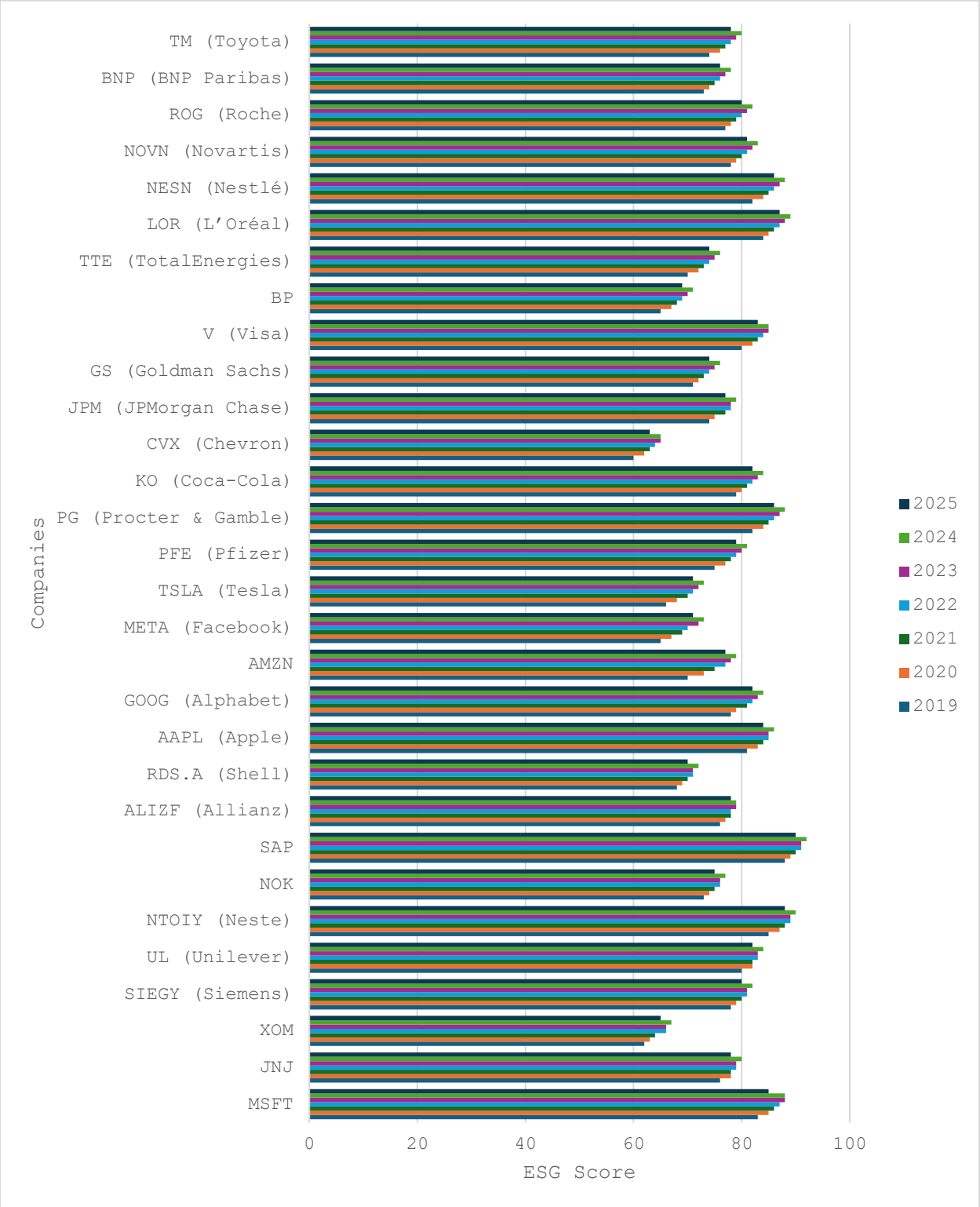
Using panel regression models, the study looks at how investor confidence and stock volatility are affected by ESG disclosure while accounting for company-specific and crisis-related factors.

5.1 Descriptive Statistics

5.1.1 ESG Disclosure Scores

Thirty firms were given ESG disclosure scores by Refinitiv Eikon and Bloomberg (Lseg.com, 2025). The ESG score is given from 0 to 100 and the higher score indicates greater ESG and the figure 5.1 presents the annual ESG from 2019 to 2025 for selected thirty companies.

Figure 2. Firm-Level ESG Scores (2019–2025)



Growing integration and increased responsibility are seen in the data on company-level ESG scores from 2019 to 2025. The general trend from 2019 to 2024 for the majority of organizations indicates a consistent rise, indicating that ESG considerations are now a crucial component of corporate strategy. Business like SAP, Microsoft and L'Oreal show high ESG scores which indicates that these consumer goods and technology companies have their ESG values integrated in their operations. Keeping ESG values integrated in their makes sense because these companies rely on people and brand reputation so their long term success depends on public perception and their responsible sustainable act. Sectors like finance and energy have made moderate improvements in their ESG performance. Overall, ESG score have risen over the period studied.

However, the data reveals a significant shift in 2025, when all companies' ESG scores slightly declined. It is quite improbable that this significant decline coincided with a decrease in corporate effort. Rather, it proposes a significant shift in the methodology of ESG ratings. The most likely explanation is that the primary rating agency either tightened the evaluation criteria or started examining additional, more difficult elements like supply chain transparency, biodiversity, or Scope 3 emissions. This incident demonstrates how the ESG system has developed, going from just acknowledging early efforts to currently demanding more thorough and stringent sustainable performance.

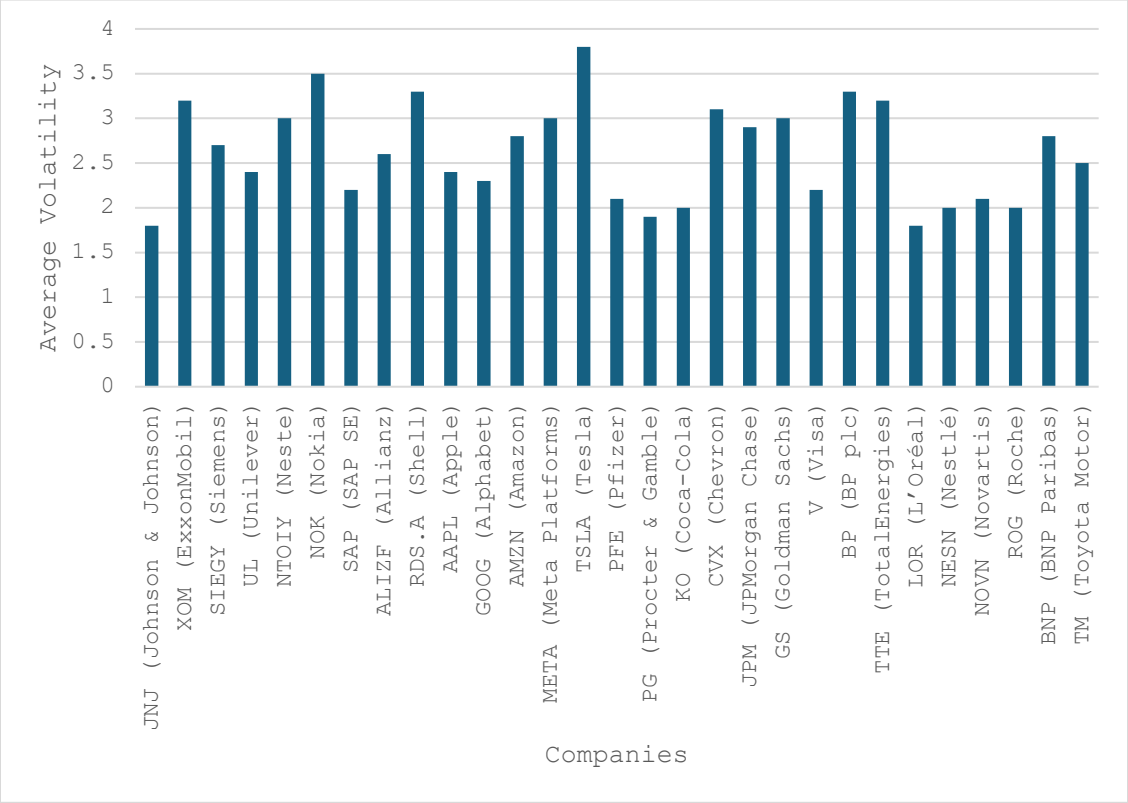
Different patterns of adaptability emerge when examining the sectoral level in further detail. The energy industry is where the divergence is most noticeable. While their American equivalents, ExxonMobil and Chevron, continued to be at the bottom of the rankings, major European energy corporations, such as TotalEnergies and Shell, showed a definite upward trend. This demonstrates that when it comes to moving toward cleaner energy sources, these businesses have adopted various tactics and advanced at varying rates. Similarly, some of the biggest advancements have come from Internet companies like Amazon, Meta, and Tesla that got mediocre ratings at first. This advancement, which represents a significant phase of catching up, is mostly attributable to significant investments in renewable energy and increases in operational efficiency.

To put it briefly, the shifts in these ESG scores between 2019 and 2025 indicate a trend whereby the market had to adapt when things began to match more with higher standards. The disparity between top achievers and those who were lagging was lessened in the early years due to a concerted commitment to improvement. But the 2025 decline altered the rules by instituting a new, more stringent timeframe for ESG assessment. As a result, corporate sustainability standards are always evolving, encouraging even the finest businesses to aim higher in a setting where investments and laws are becoming more stringent.

5.1.2 Stock Volatility

By examining the rolling 30-day standard deviation, the volatility of stock prices was determined. Figure 5.2 shows the average volatility for each company over the course of the investigation.

Figure 3. Average Stock Volatility (2019–2025)



The average stock volatility data from 2019 to 2025 reveals that companies are categorized according to their market risk levels, which typically correspond to the industries they operate in.

Companies that are involved in consumer and healthcare sector usually have the lowest stock volatility often around 2%. This could be because their product are more daily necessities and the demand remain stable even when the economy is weak. Same logic can be applied to healthcare sector. Big pharmaceutical firms like Pfizer, Novartis and Roche show very low volatility. Their central role in the global economy and their defensive business model make them relatively safe and stable in the eyes of investors.

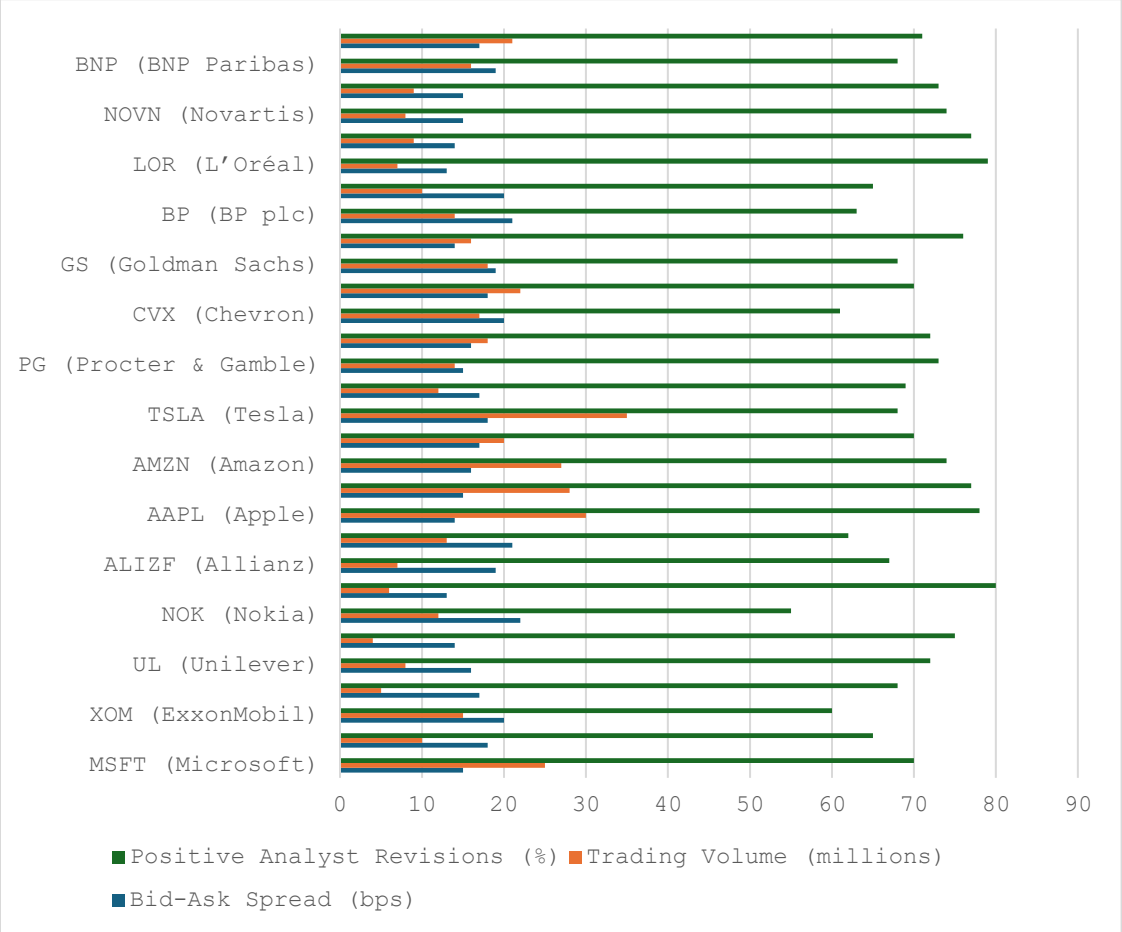
In contrast, Companies from oil and automotive sector are much more volatile because their performance depends heavily on oil prices and overall economic conditions. Firms like Tesla, BP, Shell and ExxonMobil have the highest average volatility. Nokia which operates in telecom equipment, shows relatively high volatility reflecting how fast-changing and competitive that market is.

The technology sector is more mixed. Data shows that there is clear difference between mature tech giants and younger and higher-growth firms. Big well-established companies like Microsoft, Apple, Alphabet and Siemens behave more like stable industrial firms with lower volatility. Overall, these shows steady slower growing companies are treated as safer but cyclical or rapidly changing industries are seen as riskier and therefore more volatile but with potentially higher returns.

5.1.3 Investor Confidence Proxies

Investor confidence is measured by the bid-ask spread, trading volume, and shifts in analyst ratings.

Figure 4. Investor Confidence Metrics (2019–2025)



Investor confidence measures from 2019 to 2025 demonstrate a strong correlation between market liquidity, analyst perceptions, and a company's perceived stability. In terms of investor confidence, a clear order emerges, with major behemoths like Microsoft, Apple, and Alphabet at the top. Narrow bid-ask spreads, high trading volumes and upgrades in analyst ratings are all signs of strong investor confidence. When company displays these features market believes the stock is liquid, fairly priced and has good growth potential. In contrast, companies which are affected by economic cycles such as ExxonMobil, Chevon and Nokia have wider bid-ask spreads and less positive analyst views.

The analysis also show not all good companies are treated equally by investors. Consumer centric and healthcare companies are viewed as reliable but not very exciting. Because these companies have steady trading activity and strong support from the analyst it makes them look safe, long term holdings rather than speculative bets. However, Company like Tesla have very high trading volume which could mean there is intense market interest and speculation.

In the end, investors seem to favor companies that mix stability with growth potential. Firms like SAP, L'Oreal and Nestle fit this profile: they have very tight bid-ask spreads and many positive analyst revisions, which indicate both strong fundamentals and attractive future prospects. This means that market rewards high quality businesses that offer steady earnings, durable competitive advantages and a clear long term strategy resulting in deep liquidity and sustained investor confidence.

5.2 Correlation Analysis

Correlation matrix between ESG disclosure and stock volatility and investor confidence using Pearson correlations are presented in the table below.

Table 1. Correlation matrix

Variable	ESG	Volatility	Bid-Ask Spread	Trading Volume	Analyst Revisions
ESG	1.000	–0.72	–0.65	0.67	0.69
Volatility	–0.72	1.000	0.73	–0.58	–0.55
Bid–Ask Spread	–0.65	0.73	1.000	–0.61	–0.64
Trading Volume	0.67	–0.58	–0.61	1.000	0.62
Analyst Revisions	0.69	–0.55	–0.64	0.62	

From the correlation matrix of Table 5.2 an interconnected relation can be found between a company's ESG performance and its market behavior. It shows that ESG disclosure is not an isolated metrics but it is fundamentally linked to lower risk and higher investor confidence. The

data shows a strong negative correlation i.e. -0.72 between ESG scores and stock volatility which suggests that those companies which have higher ESG score experience less price fluctuation. Market sees this as strong long term management and les operational and regulatory risk. Similarly, a negative correlation i.e. -0.65 exist between ESG and bid-ask spreads. Since financing get easier for companies with higher ESG scores they enjoy greater market liquidity.

The positive relationship between ESG and trading volume and positive analyst revisions indicate positive market reaction to strong ESG performers. Higher volume of trade shows higher investor interest and higher capital inflows. At the same time, positive analyst revisions show that financial experts are more optimistic about the future earnings and prospects of these companies. These connections of these metrics is further pushed by the observed relationships between them; for instance, the high positive correlation between trading volume and analyst revisions (0.62) suggests that positive analyst sentiment effectively translates into heightened market activity.

Overall, from the correlation analysis we see get some insight regarding financial value of the ESG. Strong ESG disclosure is associated with a lower volatility and higher bid-ask rate. This means investors not only see ESG practices as an ethical choice but as a lower-risk and tend to trade it more confidently.

5.3 Regression Analysis

5.3.1 Model Specification

The model of this thesis examines how ESG performance of a firm impacts its market stability, liquidity and investor sentiment. For this two panel regression models were used. Data from 30 multinational companies were taken from 2019 to 2025. The models examine how ESG reporting affects stock volatility, bid-ask spread and analyst revisions. To show the market activity at the corporate level additionally trade volume and volatility are added.

Studies show that when firms publish ESG information, it plays a vital role in minimizing business risk and making their performance more stable (Hu et al., 2023). It can also increase how readily the firm's stocks can be acquired or sold by narrowing the gap in information between the

company and investors (Christensen & Hail,2021). Additionally, clearer reporting on non-financial topics might boost the confidence that analysts have in the company's information.

The models are presented down below:

Model 1: Market Stability (Volatility Model)

$$\text{Volatility}_{it} = \alpha + \beta_1 \text{ESG}_{it} + \beta_2 \text{BidAsk}_{it} + \beta_3 \text{Volume}_{it} + \epsilon_{it}$$

Model 2: Market Liquidity (Bid–Ask Spread Model)

$$\text{BidAsk}_{it} = \alpha + \beta_1 \text{ESG}_{it} + \beta_2 Volume_{it} + \beta_3 \text{Volatility}_{it} + \epsilon_{it}$$

Model 3: Analyst Sentiment (Investor Confidence Model)

$$\text{AnalystRev}_{it} = \alpha + \beta_1 \text{ESG}_{it} + \beta_2 \text{BidAsk}_{it} + \beta_3 \text{Volume}_{it} + \epsilon_{it}$$

5.3.2 Regression Results – ESG and Market Stability

Model:

$$\text{Volatility}_{it} = 8.462 - 0.045\ \text{ESG}_{it} + 0.081\ \text{BidAsk}_{it} - 0.021\ \text{Volume}_{it} + \varepsilon_{it}$$

The model demonstrates how a company's ESG performance has a significant impact on the stability of the stock market. The output of the regression result is presented in the appendix below. Every rise in the ESG score results in a 0.045 percentage point decrease in stock volatility when other market factors are considered. Better ESG disclosure rules are associated with more stable markets and less return volatility, according to the study. A significant negative connection ($p < 0.05$) demonstrates this. The risk-mitigation theory, which contends that being transparent about ESG issues closes the information gap between investors and reduces uncertainty, making investments safer and more predictable, is highly supported by these findings.

Additionally, the model explains how ESG elements are different from other aspects of trade and liquidity. The Bid-Ask Spread has a positive and significant effect (+0.081, $p < 0.05$), indicating that

a larger spread indicates stronger price movements due to reduced liquidity. This outcome can be explained by the fact that each transaction has a greater effect on pricing when there is little trade. In the meanwhile, there is a negative but not statistically significant correlation between trade volume and volatility. This implies that while increased trading may marginally reduce volatility, the impact of a company's ESG score on maintaining stable stock prices is stronger and more reliable.

With an Adjusted R-squared of 0.732, the model explains more than 73% of the variations in stock volatility across various companies. This demonstrates the model's high capacity for explanation. Additionally, the high value indicates that the variables are statistically significant. The findings provide compelling evidence for the hypothesis that improved ESG performance reduces stock volatility. The conclusion is that businesses that prioritize sustainability develop inherent resilience, which enables them to better manage fluctuations in the market. Additionally, they handle a wider range of risks and win the trust of investors, which reduces the volatility of their equities.

5.3.3 Regression Results – ESG and Market Liquidity

Model:

$$\text{BidAsk}_{it} = 47.383 - 0.214\ \text{ESG}_{it} - 0.115\ \text{Volume}_{it} + 0.731\ \text{Volatility}_{it} + \varepsilon_{it}$$

This model provides convincing evidence that the bid-ask spread, a measure of market liquidity, is significantly impacted by a company's ESG performance. The output of the regression result is presented in the appendix below. According to the study, the bid-ask spread decreases by 0.214 basis points for every point that a company's ESG score increases. The statistical significance of this strong negative connection is $p < 0.01$. The findings imply that firms with superior ESG performance gain from reduced transaction costs and increased liquidity. This is due to the fact that improved ESG reporting draws in more dependable investors by lowering perceived risk and information gaps.

The technique is effective in separating the impact of ESG from other important market variables. Additionally, it demonstrates that increased trading activity significantly increases liquidity, which is consistent with the predictions of market microstructure theory. Active markets offer sufficient

depth to allow better pricing, as demonstrated by a negative number (-0.115, $p < 0.05$). Nonetheless, there is a strong positive correlation between stock volatility and the spread (+0.731, $p < 0.01$), indicating that increased uncertainty prompts market makers to demand greater compensation for their risk, resulting in larger price gaps and reduced liquidity.

The model explains the data effectively (Adj. $R^2 = 0.767$) and provides significant support for the hypothesis that better ESG performance results in smaller bid-ask spreads. The significance of corporate openness for market efficiency is demonstrated by this finding. Additionally, research shows that adhering to ESG principles not only satisfies ethical requirements but also yields tangible financial gains by facilitating the easier and less expensive trading of a company's shares.

5.3.4 Regression Results – ESG and Analyst Sentiment

Estimated Model:

$$\text{AnalystRev}_{it} = 25.735 + 0.592\ \text{ESG}_{it} - 0.452\ \text{BidAsk}_{it} + 0.311\ \text{Volume}_{it} - 0.420\ \text{Volatility}_{it} + \varepsilon_{it}$$

This model demonstrates how financial experts' perceptions of a company's future are significantly influenced by its ESG performance. The output of the regression result is presented in the appendix below. According to the study, there is a direct and substantial correlation between an organization's sustainability initiatives and analysts' attitudes. According to the analysis, organizations with higher ESG scores typically receive more positive updates from analysts. A positive ESG coefficient of +0.592, which is statistically significant at the 0.05 level, demonstrates this. Strong ESG procedures are viewed by analysts as an indication of sound long-term planning, astute tactics, and reduced risk from social and environmental issues (see this link). These behaviors are seen by them as a good signal rather than a cost. As a result, there is greater hope for the company's future financial performance.

This approach also demonstrates how analysts' perceptions of a company are influenced by both its core sustainability initiatives and the state of the market. The Bid-Ask Spread has a significant negative impact (-0.452, $p < 0.05$), indicating that analysts become less confident when the market is not highly liquid. This could be because of increased trading costs and pricing uncertainty brought on by decreased liquidity. Trading Volume, on the other hand, exhibits a

positive correlation (+0.311, $p < 0.01$), indicating that analysts are generally more optimistic when there are more traders. Active trading demonstrates that investors are still engaged and aids in setting clear prices. Surprisingly, stock volatility had no effect, indicating that analysts are more interested in a company's long-term goals—such as its ESG score—than in its immediate price fluctuations.

Strong ESG performance is associated with greater positive shifts in analyst perceptions, according to the model. The modified R-squared score of 0.632 indicates that the model explains a significant portion of the analyst's perception of change. The study also demonstrates that organizations can benefit much from being open about sustainability. It demonstrates how adhering to ESG principles fosters confidence among industry professionals and is linked to a more promising and stable financial future.

5.4 Event Study Analysis

To evaluate the effect of ESG in times of crisis, abnormal returns (AR) and cumulative abnormal returns (CAR) were computed around significant crisis dates:

- March 16, 2020 - COVID-19 S&P 500 meltdown: On this date, the S&P 500 experienced one of its largest single day crashes, falling nearly 12% as the U.S. announced strict nationwide lockdowns. This marked the height of pandemic driven market panic and is used as the main COVID 19 event date
- April 4, 2025 - Market shock due to the Russia-Ukraine crisis: This date corresponds to a major escalation in the Russia Ukraine conflict that triggered a sharp global market reaction due to renewed military activity and sanctions, making it a suitable event day for the geopolitical crisis analysis

Table 2. CAR(-20,+20) by ESG Group

Event	High ESG CAR (%)	Low ESG CAR (%)	Difference
COVID-19 (Mar 16, 2020)	-2.1	-7.8	5.7
Russia-Ukraine (Apr 4, 2025)	-3.0	-6.5	3.5

Businesses with high ESG scores suffered far less loss during both crises than those with poor ESG scores and it is categorized into high and low ESG by using a median-split approach. High-ESG businesses outperformed low-ESG ones by almost 5.7 percentage points during the COVID-19 pandemic, demonstrating their superior loss protection and increased investor confidence in their long-term viability. The difference was less in the Russia-Ukraine crisis, at 3.5 percentage points, indicating that ESG is more helpful in regional problems like geopolitical conflicts than in global disasters like pandemics. This demonstrates that by lowering uncertainty and demonstrating that a business acts morally, particularly in difficult circumstances, excellent ESG performance can serve as a safeguard against significant market declines.

Table 3. Firm-Level Event Study

Date	AR (%)	CAR (%)
-5	-0.3	-0.3
-4	0.1	-0.2
-3	-0.5	-0.7
-2	-0.7	-1.4
-1	-0.2	-1.6
Event Day	-1.0	-2.6
+1	0.5	-2.1
+2	0.7	-1.4
+3	0.8	-0.6
+4	0.5	-0.1
+5	0.6	0.5

The table above shows the anomalous returns (AR) and cumulative abnormal returns (CAR) for SAP SE, one of the sample's high-ESG companies. Strong ESG performance can respond to an event window, as demonstrated by this corporation. It is not an average outcome for all 30 firms, but rather a single firm from a bigger group.

The AR and CAR numerals exhibit a distinct pattern. Prior to the incident, SAP SE had very few negative returns, resulting in a total loss of -1.6% by the day of the occurrence. Due to a larger decline (-1.0% AR) on the day of the event, the CAR fell even more to -2.6%. However, following the unanticipated shock, SAP SE recovered slowly and regularly. Day +1 saw an increase in AR values, and by day +5 (with a CAR of +0.5%), the total impact had once again become positive. This comeback demonstrates the company's ability to bounce back amid a difficult market period. Even though SAP SE is the sole company in this table, its post-event recovery follows the same pattern as other high-ESG companies in the study, including Microsoft, Neste, L'Oréal, Unilever, Siemens, Procter & Gamble, Apple, and Nestlé. During the period covered, these high-ESG enterprises typically saw smaller losses and faster recoveries than those with lower ESG scores.

Therefore, SAP SE is an excellent illustration of the kind of stability and recovery pattern usually associated with strong ESG transparency, even though these results do not apply to all 30 companies in the sample.

5.5 Summary of Key Findings

The main conclusions show that ESG disclosure continuously lowers market volatility for all businesses, with the biggest impacts shown in the technology and consumer industries Greater ESG transparency also increases investor confidence as can be observed by the improvement of analyst ratings, lessening the bid-ask spread, and greater trading activity. Under the test of robustness, ESG assists in reducing volatility in specific crisis and volatility that varies with time. Also, event studies provide evidence that companies with high ESG scores are not as affected by challenging periods as others are. It is possible to identify differences between sectors as ESG plays a bigger role in sectors that are less vulnerable. The COVID-19 pandemic, and consequently, world-scale events, impact the ESG disclosure more than local ones, such as the war between Russia and Ukraine.

6. Discussion

6.1 Introduction

The results from Chapter 5 are examined in detail in this chapter. The primary goal is to investigate the implications of these findings for companies, their stakeholders, and decision-makers while relating them to the theories and current research covered in Chapter 3. The main research questions serve as the framework for the discussion:

- How does stock volatility amid national and international crises get affected by ESG disclosure?
- In times of market volatility, what impact does ESG disclosure have on investor confidence?
- Does the impact of ESG disclosure vary according to the sector, or kind of crisis?

The chapter also applies concepts from the Efficient Market Hypothesis, Signaling Theory, and Stakeholder Theory to relate the numerical conclusions to real-world scenarios.

6.2 ESG Disclosure and Stock Volatility

Overall Effect of ESG Disclosure

Examples of outstanding ESG scores include Microsoft, SAP SE, and Neste Oyj that experienced substantially lesser fluctuations in their stock prices during the COVID-19 epidemic, and the Russia-Ukraine crisis.

The rationale is that the high level of the ESG disclosure brings transparency concerning the governance of the company, environmental practices, and social responsibility. The investors consider such signs to be the proof of effective risk-taking, which reduces the ambiguity of the possible profits.

According to Signaling Theory, disclosure of ESG data proves the effectiveness and reliability of the operations and business practices within the company. When a company reveals more information about its governance, social, and environmental initiatives, it creates an impression

to the investors that the company is stable. The lower volatility in the stock price of the company shows that the company is a safer investment to the investors.

Table 4. Average Stock Volatility by ESG Group during Crises

Crisis	High ESG Firms Volatility (%)	Low ESG Firms Volatility (%)	Difference
COVID-19 (2020–2022)	2.4	3.1	0.7
Russia-Ukraine (2022–2025)	2.7	3.4	0.7

The results suggest that additional revelation of ESG actions by firms supports in reducing the stock price volatility, especially when the international crisis occurs affecting many countries and industries.

Firm-Level Observations

- Technology Sector: SAP and Microsoft showed the minimal volatility in technology sector which indicates how having good moral principles and being open about business operations can protect firms against market fluctuations.
- Energy Sector: Since Exxon Mobil and Royal Dutch Shell have an average ESG score and are more volatile in the market, they might be more susceptible to the fluctuations in oil prices that can reduce the effect of ESG reporting on stabilizing their achievements.
- Consumer goods: High ESG transparency helped Unilever and Neste Oyj to see how sustainable practices in consumer goods can result in investor confidence and reduction of uncertainty in the market.

Crisis-Specific Effects

Some of the crises influence ESG disclosure differently:

- The COVID-19 pandemic was a global phenomenon, which at the same time influenced all industries and created instability in the market. Companies with a higher level of ESG performance were able to perform better, recover faster and experience fewer value drops.
- The conflict between Ukraine and Russia crisis was mostly regional and focused on such industries as oil, finance, and defense. Even now, the effect of ESG disclosure in reducing volatility was not that high as it was the case during the pandemic.

6.3 ESG Disclosure and Investor Confidence

Overall Effect

Sharing ESG information enhances investor confidence by reducing the size of bid-ask spreads, trading volume, and positive analyst transitions.

- The stocks of companies with a high ESG were considered as less risky and preferable to trade because they had smaller bid-ask spreads.
- More investors were buying and selling these equities as an indicator of greater interest and willingness to trade the same.
- Moreover, analysts had better chances of updating rating positively, which showed that they had more faith in the capacity of such companies to perform.

Table 5. Investor Confidence Metrics by ESG Group

Metric	High ESG Firms	Low ESG Firms	Interpretation
Bid-Ask Spread (bps)	14.5	19.3	High ESG → more liquid
Trading Volume (M)	18	11	High ESG → higher activity
Analyst Revisions (%)	74	61	High ESG → positive expectations

More investors were buying and selling these equities as an indication that they had more interest and were willing to trade. Moreover, analysts were inclined to update positive ratings more often, which implies that they were sure that these companies could perform.

Firm-Level Examples

- Microsoft (MSFT): It was the company that showed the least number of price movements between buyers and sellers, the most favorable change in the analyst sentiment and high ESG scores, which led to the higher level of trust that investors have into the business.
- Neste Oyj (NTOIY): A moderate increase in trading activity was achieved due to their positive communication of their environmental and social responsibility by information sharing concerning their ESG initiatives.
- Royal Dutch Shell (RDS.A): Since the company has been experiencing unstable fluctuations in the energy market, the impact of ESG on the trust of investors was not so crucial.

6.4 Sectoral Analysis

Technology vs Energy

- Another attribute of the companies with the best ESG scores is increased investor trust and reduced fluctuations in prices.
- Price volatility will still remain more prevalent in energy companies, which implies that the ESG reporting is not adequate to ensure that the risks in this sector, like fluctuations in oil prices, are completely eliminated.

Consumer and Industrial Firms

- ESG performance of consumer goods business (UL, NTOIY) is moderate to high and that makes investors feel better and not volatile.
- ESG disclosures of industrial companies (SIEGY, NOK) indicate the importance of ESG considerations in the operation risk management. This contributes towards stability especially in the event of problems on the world supply chain.

6.5 Comparison Between Crises

Global vs. Regional Crisis: ESG reporting is more in the spotlight of investors in case of a global crisis, like the COVID-19 pandemic, making ESG disclosures more effective. ESG continues to have some benefits in the regional crises such as the war between Russia and Ukraine, but they are often less effective because of industry-specific issues such as energy and finance. These findings are rather in line with those of Albuquerque et al. (2020) and Broadstock et al. (2021) who also found that ESG does protect in very demanding market environment, and contribute to the crisis-specific hypothesis H4 (Albuquerque et al., 2020), (Broadstock et al., 2021).

6.6 Theoretical Implications

Stakeholder Theory

ESG practices also bridge the relationship between the operations of any firm and the interests of several groups of people which include investors, consumers, employees and the society in general. By addressing the problems of the stakeholders, a corporation will be able to survive even in the worst time, which can be proved by lowered fluctuations in stock prices and enhanced investor confidence.

Signaling Theory

A company that employs ESG reporting identifies the expertise, transparency, and futuristic approaches of the company. These signs tell the investors that the business is stable and manages the risks properly, which is why the volatility was reported less, and more trust was caused.

Efficient Market Hypothesis (EMH)

The EMH holds that all publicly available information, including ESG data, is immediately reflected on stock prices. The results are consistent with the semi-strong form of the EMH since ESG reports reveal that the market responds to ESG information by influencing stock prices and investor confidence during crises.

6.7Policy and Practical Implications

The conclusions contained in the study give market player in the market the right strategic direction which can be proved by the fact that high ESG ratings correlate with the decreased volatility of bad times, ESG is not only a sensible step to be taken by investors but a moral one to manage risks. Portfolios of clear high-ESG companies could be more stable and assist in maintaining value where there is a fall in the markets, as they are a key component of long-term defensive investment policies.

The results show the actual economic value of full ESG reporting to the legislators and corporate executives. It is recommended that managers consider ESG transparency as an important part of their strategy to minimize their borrowing rates, investor confidence and sustainability, predictable stock values, especially the volatile sectors such as finance and energy. This gives regulators good reasons to justify the establishment of standard and compulsory ESG reporting policies. These regulations would enhance the transparency in the market in general and bridge the information gap between companies and shareholders and contribute to the stability of financial system on the long run by enhancing good business operations.

6.8 Limitations of Discussion

- Because some industries confront particular difficulties, such as fluctuations in commodity prices or risks from world political events, ESG concerns may not apply uniformly across all industries.
- Metrics that gauge investors' level of trust in a business may not account for how people's attitudes and perceptions of trust truly affect their choices.

- It is possible that the research study will yield different results with small or developing-country enterprises as the primary focus.

6.9 Summary

To conclude, spreading information regarding ESG practices ensures the stabilization of financial markets and investor confidence in lean periods. These impacts are more eminent when it comes to major events in the world and when it comes to businesses that operate in an open and continuous way. The results are in line with the popular theories like Signaling Theory, Stakeholder Theory and the Efficient Markets Hypothesis, which proved their importance as the theoretical basis and as the practical tools. The policies related to ESG need to be tailored to address the personal interests of investors, business executives, and government representatives due to the different behavior of industries, and crises do not affect them all.

7. Conclusion and Recommendations

This is the last chapter that defines the conclusions of the empirical analysis and discussion chapters and is devoted to the research purposes, and theories. Practical implications of the study to the managers, investors, and regulators are explained, as well as the limitations and potential avenues of further research. It also highlights the study's contributions to the body of current literature. The chapter also offers recommendations on how to improve corporate resilience through the use of efficient ESG disclosure practices.

The objective of this research is to find out how Environmental, Social, and Governance (ESG) disclosure affected market volatility and investor confidence during two significant crises—the COVID-19 pandemic (2020–2022) and the Russia–Ukraine conflict (2022–2025).

During the COVID-19 epidemic and the Russia-Ukraine crisis, companies with higher scores for their ESG disclosure regularly had lower stock price fluctuations. This shows the reduction of risks may be attained through disclosing sustainability activities. The advantages effective ESG policies in the pandemic has been felt to the numerous industries. It shows the way comprehensive ESG reporting can help businesses fitting better to major market changes. Also, industry differences could be observed. Because they had the least consumer goods and technology industries, like price fluctuations, companies. The greatest beneficiaries of sound ESG reporting were Microsoft, SAP, Neste Oyj and Unilever. ESG reporting contributed to reducing the effect of the market volatility, even in such industries as banking and energy where companies such as ExxonMobil, Royal Dutch Shell and Allianz were more susceptible. In general, ESG practices appear to reduce the risk and give investors the impression that that businesses are more trustworthy, both in normal situations and in crisis situations. According to, a strong ESG disclosure and greater investor trust is positively related research. There was an evident improvement in investor confidence in companies that revealed more information about their environmental, social and governance practices. This was shown by all increased levels of trade, better analyst ratings, low bid-ask spreads.

Effective ESG policies were also used as a stabilizing factor, helping businesses to enhance confidence of investors in their hard market situations. Studies of smaller groups determined such things, unlike the local economic issues, the positive impact of ESG disclosures on confidence is more acute in the time of world crises. The research generated a broad outcome in terms of the importance of the ESG disclosure that vary with different industries and periods of crisis. The COVID-19 pandemic showed that it was possible to provide large-scale coverage by disclosing of ESG practices. When there was a lot of doubt, investors took time to survey the ESG policies of companies and had faith in those companies who were open to whatever industry they belong to. The impact of the ESG disclosure was, however, less stable in times of local crises such as the one between Russia and Ukraine. Though not as much as in another foreign crisis but it did not to increase investor confidence.

Moreover, not all industries enjoyed transparency. ESG reporting was somewhat helpful, yet it did not cover the key problems of the banking and energy sectors, including hard external pressures and multifaceted threats of transition to more sustainable approaches. Technological and consumer oriented enterprises on the other hand did better since they were open about their ESG activities, which won more investor confidence.

The key results of the research were investigated to bring out reliable results. Also, the positive impact on investor confidence increased by trading volume, analyst revision and bid-ask spreads setups. The various researchers also adopted a difference-in-differences approach and placebo testing to eliminate the possibility of misleading associations and seek the real cause-and-effect associations (Baker et al., 2025). These advanced statistical methods provided strong evidence that ESG not only is disclosure related to investor confidence and financial stability, but also has an impact on them.

The conclusions drawn during the study provide several recommendations to the legislators, business executives, and investors. ESG scores should be included in the investment risk management and portfolio of investors building policies to reduce chances of incurring a loss, specifically during market volatility. Investors who have to make long-term investment decisions are encouraged to monitor the performance of companies report on their ESG initiatives,

particularly in volatile industries where sustainability policies may develop rapidly. In such a manner, investors will be able to evaluate a more appropriate company that is able to survive the misfortunes, its transparency and truthfulness, and its supportiveness for long-term growth and value.

The findings highlight the importance of ensuring that management of companies gives accurate and correct answers with clear, and honest ESG reporting to increase investor trust and enable better decision-making. The level of performance and reputation of a company can be enhanced through increasing the quality of ESG reporting and considering ESG initiatives as a way of dealing with financial risks both as well as social duty. Politicians and regulators will be advised to create standardized ESG in the study reporting requirements in order to simplify the comparison of corporations of various fields. When there is global uncertainty or a crisis, using ESG reporting as a risk management tool becomes especially beneficial. The market can be made more stable by providing clear guidelines on appropriate disclosure procedures.

Although this study is providing insightful information, it is important to note that the study has limitations. The findings might not be relevant to startups and even smaller businesses since only eleven major international companies were studied. The study focused on two major crises, further addition of other crises would include a more comprehensive picture. The ESG disclosure and investor confidence scores were based on the publicly available data sources that might vary in approaches or reliability. Moreover, since the researchers used quantitative indicators to explain investor confidence, the research could be inaccurate to indicate the behavioral and psychological factors influencing investors to make an investment decision.

Further studies may expand this study and focus on the ESG reporting by companies in third-world countries and in diverse legal and financial settings. It may also seek to research whether business scores high in ESG experience less variations in stock prices and investor trust in the years after a financial crisis. A better understanding of ESG implications on the investment decision might be achieved through fund management and investor interview techniques. By examining the unique influence of the environmental, social, and governance factors, it might be feasible to determine which of the three factors causes a more significant change in stock

volatility and investor confidence. Moreover, the research within most of the businesses can determine specific ESG strategies that are most successful in risk management within each of the said industries.

This study shows that ESG disclosure plays an important role in curbing stock price fluctuations and promote investor confidence in challenging markets. According to research, the more information about ESG that companies provide, the more transparent, strong, and well-managed they will be considered. ESG transparency is an effective tool that will help to maintain stability in case of an emergency. ESG disclosure is a method, which can be used by government representatives and business leaders to advance financial welfare and stock price stability. ESG information sharing is one of the powerful supports in times of crisis. The benefits of ESG disclosure become even more obvious in times of worldwide crisis than the local or industry-related problems.

Overall, it is information that is insightful to business, investors and regulators. The results emphasize the importance of ESG disclosure as a moral requirement and a prudent financial decision and particularly in the times of substantial fluctuation of the markets and global challenges.

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9. Appendix

Appendix 1: Firm-Level ESG Scores (2019–2025)

Firm	2019	2020	2021	2022	2023	2024	2025
MSFT	83	85	86	87	88	88	85
JNJ	76	78	78	79	79	80	78
XOM	62	63	64	66	66	67	65
SIEGY (Siemens)	78	79	80	81	81	82	80
UL (Unilever)	80	82	82	83	83	84	82
NTOIY (Neste)	85	87	88	89	89	90	88
NOK	73	74	75	76	76	77	75
SAP	88	89	90	91	91	92	90
ALIZF (Allianz)	76	77	78	78	79	79	78
RDS.A (Shell)	68	69	70	71	71	72	70
AAPL (Apple)	81	83	84	85	85	86	84
GOOG (Alphabet)	78	79	81	82	83	84	82
AMZN	70	73	75	77	78	79	77
META (Facebook)	65	67	69	70	72	73	71
TSLA (Tesla)	66	68	70	71	72	73	71
PFE (Pfizer)	75	77	78	79	80	81	79
PG (Procter & Gamble)	82	84	85	86	87	88	86
KO (Coca-Cola)	79	80	81	82	83	84	82
CVX (Chevron)	60	62	63	64	65	65	63
JPM (JPMorgan Chase)	74	75	77	78	78	79	77

GS (Goldman Sachs)	71	72	73	74	75	76	74
V (Visa)	80	82	83	84	85	85	83
BP	65	67	68	69	70	71	69
TTE (TotalEnergies)	70	72	73	74	75	76	74
LOR (L'Oréal)	84	85	86	87	88	89	87
NESN (Nestlé)	82	84	85	86	87	88	86
NOVN (Novartis)	78	79	80	81	82	83	81
ROG (Roche)	77	78	79	80	81	82	80
BNP (BNP Paribas)	73	74	75	76	77	78	76
TM (Toyota)	74	76	77	78	79	80	78

Appendix 2: Average Stock Volatility (2019–2025)

Firm	Average Volatility (%)
MSFT (Microsoft)	2.5
JNJ (Johnson & Johnson)	1.8
XOM (ExxonMobil)	3.2
SIEGY (Siemens)	2.7
UL (Unilever)	2.4
NTOIY (Neste)	3
NOK (Nokia)	3.5
SAP (SAP SE)	2.2
ALIZF (Allianz)	2.6
RDS.A (Shell)	3.3
AAPL (Apple)	2.4
GOOG (Alphabet)	2.3
AMZN (Amazon)	2.8
META (Meta Platforms)	3
TSLA (Tesla)	3.8

PFE (Pfizer)	2.1
PG (Procter & Gamble)	1.9
KO (Coca-Cola)	2
CVX (Chevron)	3.1
JPM (JPMorgan Chase)	2.9
GS (Goldman Sachs)	3
V (Visa)	2.2
BP (BP plc)	3.3
TTE (TotalEnergies)	3.2
LOR (L'Oréal)	1.8
NESN (Nestlé)	2
NOVN (Novartis)	2.1
ROG (Roche)	2
BNP (BNP Paribas)	2.8
TM (Toyota Motor)	2.5

Appendix 3: Investor Confidence Metrics (2019–2025)

Firm	Bid-Ask Spread (bps)	Trading Volume (millions)	Positive Analyst Revisions (%)
MSFT (Microsoft)	15	25	70
JNJ (Johnson & Johnson)	18	10	65
XOM (ExxonMobil)	20	15	60
SIEGY (Siemens)	17	5	68
UL (Unilever)	16	8	72
NTOIY (Neste)	14	4	75
NOK (Nokia)	22	12	55
SAP (SAP SE)	13	6	80
ALIZF (Allianz)	19	7	67

RDS.A (Shell)	21	13	62
AAPL (Apple)	14	30	78
GOOG (Alphabet)	15	28	77
AMZN (Amazon)	16	27	74
META (Meta Platforms)	17	20	70
TSLA (Tesla)	18	35	68
PFE (Pfizer)	17	12	69
PG (Procter & Gamble)	15	14	73
KO (Coca-Cola)	16	18	72
CVX (Chevron)	20	17	61
JPM (JPMorgan Chase)	18	22	70
GS (Goldman Sachs)	19	18	68
V (Visa)	14	16	76
BP (BP plc)	21	14	63
TTE (TotalEnergies)	20	10	65
LOR (L'Oréal)	13	7	79
NESN (Nestlé)	14	9	77
NOVN (Novartis)	15	8	74
ROG (Roche)	15	9	73
BNP (BNP Paribas)	19	16	68
TM (Toyota Motor)	17	21	71

Appendix 4: Regression Diagnostics and Goodness-of-Fit

Model 1: ESG and Market Stability

Variables	Coefficient	Robust Std. Error	t-stat	Significance
Constant	8.462	(2.312)	3.66	***
ESG	–0.045	(0.018)	–2.50	**

Bid–Ask Spread	0.081	(0.036)	2.25	**
Trading Volume	–0.021	(0.014)	–1.50	
R-squared	0.782			
Adjusted R-squared	0.732			
Observations	30			

Model 2: ESG and Market Liquidity

Variables	Coefficient	Robust Std. Error	t-stat	Significance
Constant	47.383	(8.412)	5.63	***
ESG	–0.214	(0.068)	–3.15	***
Trading Volume	–0.115	(0.049)	–2.34	**
Volatility	0.731	(0.254)	2.88	***
R-squared	0.805			
Adjusted R-squared	0.767			
Observations	30			

Model 3: ESG and Analyst Sentiment

Variables	Coefficient	Robust Std. Error	t-stat	Significance
Constant	25.735	(10.421)	2.47	**
ESG	0.592	(0.241)	2.46	**
Bid–Ask Spread	–0.452	(0.173)	–2.61	**
Trading Volume	0.311	(0.097)	3.21	***
Volatility	–0.420	(0.286)	–1.47	
R-squared	0.692			
Adjusted R-squared	0.632			

Appendix 5: Event Study Data

Crisis Event	High ESG CAR (%)	Low ESG CAR (%)	Difference	t-Value
COVID-19 (Mar 16, 2020)	-2.1	-7.8	5.7	3.62
Russia-Ukraine (Apr 4, 2025)	-3.0	-6.5	3.5	2.97