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MASTER THESIS

ESG RODIKLIŲ POVEIKIS FINANSINIŲ INSTITUCIJŲ AKCIJŲ KAINOMS	**THE IMPACT OF ESG PERFORMANCE ON STOCK PRICES OF FINANCIAL INSTITUTIONS**

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LIST OF ABBREVIATIONS

ESG – Environmental, Social, and Governance Factors

E Pillar – Environmental Factor

S Pillar – Social Factor

G Pillar – Governance Factor

CSR – Corporate Social Responsibility

1. INTRODUCTION

The importance of analysis of Environmental, Social, and Governance (ESG) risks and ESG impact on investments have both increased since the first mention of the ESG concept in the United Nations' "Who Cares Wins" report in 2004 (Byrne, n.d.; United Nations (UN), 2004, p. 7). From a company's perspective, ESG analysis helps to indicate, evaluate, and mitigate ESG risks and improve its reputation and risk management practices (MSCI, n.d.). Twenty years ago, the company's financial performance was a key focus when choosing it for investment; however, with raising sustainability awareness, long-term investment focus, increasing ESG compliance practices, and more developed tools to track ESG risks, investors started to consider ESG factors as well (MSCI, n.d.). A better ESG rating of a firm might be more attractive for an ESG-conscious investor; however, the primary focus is still on returns and wealth creation (Johann, Kumari, Mladenović & Parikh, 2023). Hence, scholars have analyzed the rationale behind choosing a company with a higher ESG rating for investment. Therefore, the research of other authors will be discussed in the literature review part of this thesis. Also, it has been noticed that many of the studies completed in the field focus on a large pool of various companies, countries, or industries. Still, the effect of ESG performance on financial institutions' stock returns is not widely analyzed. Ersoy, Swiecka, Grima, Özen, and Romanova chose to explore how ESG performance affects US banks' market value, stating that only a small number of studies like theirs were performed at the time of the research (2022). Also, the authors emphasize that research in the field is essential for investment managers and policymakers who want to increase the market value of banks and comply with the requirements of ESG (Ersoy et al., 2022). Financial institutions are a significant and essential part of the world's economy, and their stock price, like any other equity, reacts to various economic and non-economic factors. Therefore, this thesis will focus on analyzing the extent to which ESG ratings can affect the stock performance of European financial institutions.

Research Problem

To what extent are ESG factors affecting the stock performance of European financial institutions?

Thesis Purpose

This thesis aims to assess to what extent ESG factors affect European financial institutions' stock performance.

Thesis Objectives

1. To investigate the importance of ESG ratings for Financial Institutions in terms of requirements in the EU.
2. To examine academic literature on CSR theories that influenced the development of the ESG concept.
3. To examine academic literature on companies' stock and financial performance dependence on ESG performance and Financial Institutions' stock and financial performance dependence on ESG performance.
4. To analyze and present ESG ratings and European Financial Institutions stocks pool that will be evaluated in the empirical part of this work.
5. To perform empirical research on ESG factors' effect on selected European Financial Institutions' stock prices, interpret the results, and propose recommendations for further research and improvements.

Methodology

A panel data regression model was used to examine the extent to which ESG factors affect the stock performance of European financial institutions. The ESG ratings and stock price data were retrieved from the Bloomberg database. The tests were run using Gretl statistical software. Finally, the period investigated is January 2015 – December 2022. Additionally, quartile analysis has been performed to evaluate the relationship between ESG pillar scores, stock returns, and annual stock returns standard deviation for European financial institutions.

Practical value

This thesis analyses a topic that was not widely discussed in academic works at the time of writing this thesis. Even though studies have analyzed the impact of ESG risks on a company's stock price, only a few have focused on banks or other financial institutions. Therefore, the approach of this thesis is comparatively novel. Moreover, we can distinguish three main groups in this study, which could be valuable. Firstly, independent investors, portfolio managers, and financial advisors invest in the financial sector, as the thesis tries to answer the

question of to what extent it is economically rational to consider an ESG rating score when evaluating the investment opportunity in a financial institution. Secondly, it is financial institutions themselves, as this thesis examines how ESG contributes to the market value of the institution. Finally, it is governments and other policymaking bodies, as this study provides insights into how beneficial it is, from an economic perspective, to comply with ESG regulations for financial institutions in Europe. Finally, Europe as a region was chosen for the study due to its leading ESG reporting practices and many financial institutions with assigned ESG ratings.

2. ANALYSIS OF STOCK PRICE DEPENDENCY ON ESG FACTORS IN SCIENTIFIC LITERATURE

Financial institutions' stock price performance dependency on ESG factors represented by ESG scores has been discussed in academic studies; however, it is not widely discussed. It has been noticed that scholars whose studies have been examined in this section investigated ESG factors' influence on many different companies' pool stock prices rather than financial institutions specifically. In addition, in the overview of these studies, some earlier works of academics on corporate social responsibility (CSR) topics are analyzed. As the ESG concept is relatively new and its principles come from the development and advancements of CSR, the relevant CSR theories for this thesis are also discussed.

2.1 ESG Requirements

2.1.1 ESG Concept.

To understand why this thesis raises the hypothesis that ESG factors influence financial institutions' stock prices - the origin of the ESG concept, the main reasons for its development, ESG requirements, and ESG rating specifics should be discussed. It is considered that the ESG concept, which is more structured, was introduced in 2004 in the United Nations "Who Cares Wins" report, which was a joint initiative of the UN and eighteen financial institutions (UN, 2004). The key goals of the initiative were as follows:

1. Stronger and more resilient financial markets
2. Contribution to sustainable development
3. Awareness and mutual understanding of involved stakeholders
4. Improved trust in financial institutions (UN, 2004, p. 7)

Recommendations regarding ESG implementation practices were developed for stakeholders such as investors, asset managers, analysts, brokers, companies, accountants, educators, consultants, non-governmental organizations (NGOs), regulators, stock exchanges, governments, and pension trustees (UN, 2004). Moreover, it can be observed that from the beginning, financial institutions, as co-authors of the report, emphasized the importance of more sustainable markets and societies by encouraging the implementation of ESG standards, ESG reporting, and ESG research (UN, 2004). They argued that:

> <…> successful investment depends on a vibrant economy, which depends on a healthy civil society and ultimately depends on a sustainable planet. In the long-term, therefore, investment markets have a clear self-interest in contributing to better management of environmental and social impacts in a way that contributes to the sustainable development of global society. A better inclusion of environmental, social and corporate governance (ESG) factors in investment decisions will ultimately contribute to more stable and predictable markets, which is in the interest of all market actors (UN, 2004, p. 21).

Therefore, as the trust of financial institutions, emphasized in the fourth key goal, depends on the stability of the financial markets for which ESG is essential, it is possible to assume that investors should care about the ESG risks and practices of a company, especially if that is a financial institution.

2.1.2 ESG Regulation in Europe.

In two decades, some of the recommendations for ESG reporting evolved to ESG requirements. In Europe, as of March 2021, The Sustainable Finance Disclosure Regulation (SFDR) was introduced – it covers a range of ESG metrics – with the goals to improve transparency and sustainability and prevent greenwashing (Eurosif, n.d.). It asks managers to evaluate and report "how sustainability risks are considered in their investment processes, and how they consider investment decisions that might result in negative effects on sustainability factors, known as Principal Adverse Impacts (PAIs)" (Morningstar, n.d.). Moreover, one more key sustainability regulation in Europe is the EU Taxonomy Regulation published in 2020 (EU Taxonomy, n.d.). Both SFDR and EU Taxonomy are parts of the EU Green Deal released in 2019 with the key goals as below:

1. Reorientation of capital flows with a focus on sustainable investments
2. Establishing sustainability as a component of risk management
3. Promoting/encouraging long-term investment and economic activity (EU Taxonomy, n.d.)

The EU Taxonomy Regulation created rules to define environmentally friendly and sustainable companies or enterprises, as there was no such framework to define "sustainable" or "green" (EU Taxonomy, n.d.). The Taxonomy Regulation and SFDR are just two examples of ESG-related regulations that are part of the EU Green Deal, and new rules are periodically released.

Hence, increasing regulations in Europe also emphasize the relevance of the thesis for both and is one of the main reasons why Europe was selected as the research area.

2.1.3 Criticism of ESG practices.

Even though the benefits of ESG practices have been discussed theoretically, proved in many empirical studies, and promoted by many governments and non-governmental organizations, some criticism also exists. The key arguments include that it is just a public relations move of the companies, it promotes greenwashing, it is very complicated and challenging to implement as it is not yet standardized, and the impact on society is irrelevant (UCEM, 2024). For example, a survey in the UK showed that 53% of investors in the country consider ESG factors when investing; the figure is lower than 65% in 2021 (Sulaiman, 2023). Furthermore, some surveys show that many institutional investors do not trust businesses to reach their ESG commitments (UCEM, 2024). Regarding complexity and standardization, many companies, such as Bloomberg, Dow Jones, and Moody's, rate ESG; however, the rating methodologies are different and sometimes difficult to compare (UCEM, 2024).

Chen, Luu, and Yu analyzed greenwashing in ESG disclosures (2020). The authors emphasize that data provided in ESG reports is often unaudited. Hence, there is a chance that the information is not reliable (Chen et al., 2020). Unsurprisingly, the authors found most greenwashing behavior in the Energy, Materials, and Utilities sectors (Chen et al., 2020). Moreover, the authors discovered that companies with independent directors, institutional investors, more public interest, and cross-listed tend to perform less greenwashing (Chen et al., 2020).

Moreover, in their recent study, Lin, Meng, and Zhu found scientific evidence that ESG greenwashing is positively related to equity mispricing (2023). They also discovered that ESG greenwashing associated with overpricing is more significant than underpricing (Lin et al., 2023). The effect was also more significant for companies with less competition, less environmental regulation, and lower auditing quality (Lin et al., 2023).

Also, Lyulyov, Pimonenko, Wu, Yi, and Hu, in their recent study about how ESG performance influences the green innovation of companies, discovered that ESG performance indeed seems to have an influence; however, the authors also emphasized that many researchers face limitations analyzing ESG because ESG disclosure systems are not yet formed (2024). Therefore, Lyulyov et al. suggest that governments should take a more active part in creating

such systems (2024). It could be argued that government interaction with ESG increases compliance costs, which would decrease or remove the positive effects of ESG practices (Smith, 2023). Lyulyov et al.'s results contradict this; however, such costs are a common criticism of ESG reporting; hence, they definitely should be considered (2024). Most probably, developing economies and small-to-medium enterprises are more sensitive to this. Hence, inclusive growth/sustainable growth initiatives here must also be considered.

Therefore, it just increases the need for a broader scope of ESG-related academic studies, especially ones investigating ESG's association with a company's earnings, stock returns, and influence on financial resiliency during economic shocks. Finally, the possible effects of greenwashing should be considered when creating regulations.

2.1.4 Sustainable Financial Performance

In 1991, Michael E. Porter, in his popular paper "Towards a Dynamic Theory of Strategy," defined a company's success as below:

> <…> attaining a competitive position or series of competitive positions that lead to superior and sustainable financial performance (Porter, 1991, p. 96).

It is possible to argue that in 2023, ESG rating, even though it is not an indicator of financial performance, will be an essential measure of financial performance's sustainability because enterprises with better ESG performance are more likely to be resilient to financial distress. Porter also emphasizes that an improved brand image can lower marketing costs (1991). ESG performance should improve the company's brand image from today's perspective. Moreover, Porter points out that managerial choices are also crucial to a company's favorable position and success:

> <…> managerial choices lead to the assembly or creation of the particular skills and resources required to carry out the new strategy (Porter, 1991, p. 105).

Referring to Porter in 1991, it is possible to interpret that in 2023, the governance factor of ESG rating, the effective decision-making process, should also contribute to a sustainable company's financial performance and ability to carry out its strategy.

Furthermore, in the theory, Porter emphasizes that environmental factors are also crucial for a firm's competitive advantage:

> The environment is important in providing the initial insight that underpins competitive advantage, the inputs needed to act on it, and to accumulate

> knowledge and skills over time, and the forces needed to keep progressing (Porter, 1991, p. 101).

Interpreting the above from a modern perspective, environmental ESG practices include using renewable energy, promoting green building, clean technology, and similar. Even though the author in his theory is more financial goals-oriented when considering environmental factors, it is possible to argue that the environment where a company operates and how it operates in it, both now and then, has been considered an essential part of the company's strategy leading to a better sustainable financial performance.

2.1.5 Shareholder Theory, Stakeholder Theory and ESG

One of the most controversial doctrines about a company's social responsibility is the Friedman doctrine (Shareholder theory), published in 1970. In his doctrine, Friedman confidently critiques the social responsibility of business as a concept itself and states that the only social responsibility of a company is to increase its profits. It must be done by rules, without fraud, and within free competition (Friedman, 1970). The economist states that only people can be socially responsible, at their own expense, not businesses. Hence, shareholders of the company can decide how to spend the profits (Friedman, 1970). However, as the financial crisis of 2007-2008 showed, the focus mainly on profit maximization caused the United States real estate market crash and, later, the crisis in financial markets in the country and across the globe. Therefore, one of the key goals of ESG risk management is to increase the trust of financial institutions (UN, 2004).

Another popular theory that considers business ethics and social responsibility is the stakeholder theory, which became popular after Freeman's 1984 publication. His later works discussed its application (Freeman & Mc Vea, 2001). Stakeholder theory took a broader approach to business social responsibility, stating that businesses should care about any individual or group of individuals who might be affected or affect the attainment of the firm's goals (Freeman & Mc Vea, 2001). One of the arguments is long-term success, as managers need to know what shareholders, customers, employees, and other stakeholders want to gain stakeholders' support, which is necessary to develop effective business strategies (Freeman & Mc Vea, 2001). The argument regarding strategy is similar to what Porter defined as sustainable financial performance discussed before (Porter, 1991). Hence, even though the ESG concept became popular recently, its roots and importance could be observed in much earlier works.

2.1.6 CSR Theories Mapping

As CSR was the beginning of ESG development, it is crucial to understand the origins and the key theories behind their development. In 2004, Garriga Melé, in their article "Corporate Social Responsibility Theories: Mapping the Territory," presented the landscape of CSR approaches and summarized them in a structured way. The theories were divided into four groups: instrumental theories, political theories, integrative theories, and ethical theories (Garriga & Melé, 2004).

2.1.6.1 Instrumental Theories.

The most well-known sub-categories of instrumental theories include:

1. Maximizing the shareholder value. This sub-category is the most straightforward, as the key goal is maximizing shareholder value. Social investment should be exercised if it increases shareholder value, and the investment should be rejected if the cost for the shareholder is higher than the value created by the investment.
2. Strategies for achieving competitive advantage. It is argued that philanthropic activities can give companies a competitive advantage in their management, which is also essential, as is the concept of disruptive innovation, which can improve economic and social conditions for people experiencing poverty and create a competitive advantage.
3. Cause-related marketing. The main goal is to improve the brand image and generate social media revenues to achieve a win-win situation (Garriga & Melé, 2004).

2.1.6.2 Political Theories.

According to the authors, the most critical sub-categories of political theories are as per below:

1. Corporate constitutionalism's key idea is that companies are social institutions with power, which they must use responsibly.
2. Integrative social contract theory. It is assumed that a social contract is present between companies and societies, and some responsibilities and obligations to societies exist by default.

3. Corporate citizenship. This theory implies that a corporation should also be considered a citizen. Also, it is emphasized that with increasing technological advancement, some corporations have more power than governments (Garriga & Melé, 2004).

2.1.6.3 Integrative Theories.

These theories suggest that corporate social responsibility is vital because companies rely on societies; they are needed for businesses' very existence. The main sub-categories of integrative theories are below:

1. Issues management. Companies are assumed to be responsive to social issues to achieve needed societal changes.
2. The principle of public responsibility. This theory goes beyond responsiveness to issues, using the "public" definition to emphasize the broader scope of firms' responsibilities.
3. Stakeholder management. The key goal is to achieve broad cooperation between businesses and all their stakeholders, which should be reflected in business strategy and executive and management decision-making.
4. Corporate social performance. This theory combines the three abovementioned, emphasizing responsiveness, responsibility, and management (Garriga & Melé, 2004).

2.1.6.4 Ethical Theories.

This group of theories focuses on the ethical norms of society and the relationships between enterprises.

1. Normative stakeholder theory. This is a broader concept of stockholder theory, including all the stakeholders.
2. Universal rights. These are nine principles in the UN Global Compact that many companies have adopted.
3. Sustainable developments. The key principle is corporate ecological responsibility.
4. The common goal approach. The main idea is that companies must contribute to society as they are a part of it (Garriga & Melé, 2004).

Thus, numerous theories outline various approaches to CSR and why businesses should care (or not – stockholder theory) about it. Since CSR and ESG are closely interconnected and the CSR field is extensively analyzed in scholarly works, most conclusions apply to both. These theories are integrated into business strategies that significantly affect management decisions. Therefore, understanding all possible perspectives on CSR and ESG is crucial for companies, investors in those companies, and regulatory bodies that establish regulations and reporting standards ESG.

2.2 ESG Factors' Influence on Financial Institutions

Ersoy et al. found an inverted U-shaped relationship between ESG score and bank market value, an inverted U-shaped relationship between Social Pillar Score (SPS) and bank market value, and a U-shaped (not inverted) relationship between Environmental Pillar Score (EPS) and bank market value (2022). These authors investigated the pool of 176 commercial banks in the United States in the 2016-2020 period and tested both linear and non-linear relationships (Ersoy et al., 2022). However, only the non-linear ones were discovered to be statistically significant (Ersoy et al., 2022). The authors calculated banks' market value by multiplying the stock price by ordinary shares outstanding; they emphasize, as per their knowledge, at the time of the study, they were the first ones to study bank value as market value in ESG-related studies investigating ESG and its components influence on bank value (Ersoy et al., 2022). The inverted U relationship between bank market value and ESG means that it increases with ESG investment but decreases when a certain level is reached (Ersoy et al., 2022). The authors suggest that "banks should rationalize the ESG investments and shareholder value creation" (Ersoy et al., 2022, p. 8). Moreover, the inverted U-shaped relationship between SPS also implies that socially responsible investments increase shareholder value initially, but "after a certain point, the costs of socially responsible investments exceed the benefits" (Ersoy et al., 2022, p. 9). Finally, the U-shaped relationship between EPS and market value suggests that environmental investments negatively affect bank market value until a certain level is reached; authors interpret it as probably that is due to increased costs and "environmentally-conscious investments are not highlighted enough" (Ersoy et al., 2022, p. 8). However, the U relationship suggests that "negative effect in the short run turns positive in the long run," so managers could allocate more such investments in longer-term strategy (Ersoy et al., 2022, p. 9). Regarding future studies in

the field, one of the principal authors' suggestions is to study other regions, as this study included only banks in the United States (Ersoy et al., 2022).

As Ersoy et al. in 2022 focused on bank value calculated using stock price as input, M. M. Miralles-Quirós, J. L. Miralles-Quirós & Redondo-Hernández in their study in 2019 focused on ESG performance and stock prices relationship directly; moreover, their dataset consisted of 51 commercial banks stocks. Compared to Ersoy et al. (2022), the authors investigated banks listed on 20 different stock markets and did not focus on only one country; also, the period was longer - from 2002 to 2015 (M.M. Miralles-Quirós et al., 2019). The authors found that ESG components affect stock prices differently:

> Whereas environmental and government performance are positively and significantly related to banks' share prices, social performance is negatively and significantly associated with them. (M.M. Miralles-Quirós et al., 2019, p. 1454).

By comparing the authors' results to those of the Ersoy et al. study from 2022, it is possible to discuss environmental and social factors since these were statistically significant in both works. (M.M. Miralles-Quirós et al., 2019). While the study of 2019 suggests a positive environmental score impact on a bank's share price, the survey of 2022 indicates a negative effect in the short-run but is optimistic in the long run as well (M.M. Miralles-Quirós et al., 2019; Ersoy et al., 2022). Furthermore, while the study of 2019 suggests a negative social score impact on a bank's share price, the survey of 2022 indicates a positive effect in the short-run but harmful in the long run as well (M.M. Miralles-Quirós et al., 2019; Ersoy et al., 2022). Given the longer duration of the 2019 study, the results appear quite cohesive. (M.M. Miralles-Quirós et al., 2019; Ersoy et al., 2022).

Furthermore, Fiordelisi et al. used a sample of over four hundred European banks to analyze ESG influence on bank stock resilience (2023). The authors discovered that overall ESG score is not associated with significant impact; meanwhile, better environmental performance is associated with reduced stock crash risk (Fiordelisi et al., 2023). According to the authors, the results align with signaling theory - improved environmental performance signals financial transparency and high ethical standards (Fiordelisi et al., 2023).

Moreover, Thornton and Tommaso analyzed how ESG performance affects a bank's risk-taking behavior and value (2020). The authors discovered that better ESG performance is associated with lower risk-taking behavior; however, the value was discovered to be modestly

lower, and the authors explained that this is achieved by overinvesting (Thornton & Tommaso, 2020). Logically, the authors suggest that "there is a trade-off between reducing bank risk-taking and a more stable financial system on the one hand and bank value on the other" (Thornton & Tommaso, 2020, p. 2286). It has also been highlighted that the board's composition and size significantly influence a bank's risk-taking behavior and ESG performance (Thornton & Tommaso, 2020).

Table 1

Effects of ESG on Financial Institutions – Comparison of Authors

Year, region, industry	**Authors**	**ESG**	**E**	**S**	**G**
2022, US, banking	Ersoy et al.	inverted U-shaped (positive short term; negative long-term)	U-shaped (negative short-term; positive long term)	inverted U-shaped (positive short term; negative long-term)	Not significant
2019, various countries, banking	M.M. Miralles-Quirós et al.	n/a	Positive	Negative	Positive
2023, Europe, banking	Fiordelisi, F., Ricci, O., & Santilli, G.	Not significant	Positive (reduced crash risk)	Not significant	Not significant
2020, Europe, banking	Thornton, J. & Tommaso, D. C.	Negative to value (related to overinvestment),	n/a	n/a	n/a

		positive to reduced risk-taking

Source: Authors indicated in the first two columns.

2.3 ESG Factors' Influence on Stock Price

The research on the influence of ESG on financial institutions' stock prices is very limited; hence, in this thesis, other studies investigating the influence of ESG factors on stock prices, in general, are also reviewed. Li and Yin, in a recent study, investigated how ESG performance affects stock returns using companies listed in China (2023). The authors found that stock returns of ESG performance and listed non-state-owned companies are positively related (Li et al., 2023). Hence, Li et al. suggest that companies should

> <…> adhere to sustainable development, reduce environmental pollution in production and operation processes, assume social responsibility, and improve internal governance (Li et al., 2023, p. 9).

Also, for future research, authors suggest investigating environmental, social, and governance factors' effect on stock price separately and recommend evaluating different industries and countries to gain more insights (Li et al., 2023).

Moreover, Johann et al. investigated the ESG score's influence on the equity returns of 225 Indian companies (2023). The authors evaluated environmental, social, and governance factors' effect on equity separately and found a negative impact on the Environmental component and a positive on Governance, whereas, for Social, the result was not statistically significant (Johann et al., 2023). Hence, they suggest enterprises should consider their governance structure and practices highly while "financial motivations may be needed to trigger E− and S- factor practices by companies" (Johann et al., 2023, p. 1). However, the authors did not use time series or panel data, and they recommend doing it in future studies to examine "the dynamic relationship between ESG factors and shareholder returns" (Johann et al., 2023, p. 6).

In a recent study, Kasilingam and Mohanasundaram evaluated the importance of sustainability in asset pricing. The authors included the sustainability factor in the Fama–French Five-Factor model and used the Indian market as a research region (2024). The authors discovered that sustainability factors were significant in one-third of portfolios. However, asset prices and sustainability factors were negatively related (Kasilingam & Mohanasundaram, 2024).

Therefore, comparing these studies using data from companies in India and companies in China, the latter suggests a positive ESG effect, while the other suggests that a positive effect should come from the governance factor (Johann et al.,2023; Li et al., 2023; Table 1). The negative effect of environmental factors found in the study of Indian companies partially corresponds to the US study's negative in the short-term relationship of the factor, especially as the authors of the study in India emphasize their study represents only short-term results (Johann et al., 2023; Ersoy et al., 2022).

Table 2

Effects of ESG on Stock Prices – Comparison of Authors

Year, region, industry	**Authors**	**ESG**	**E**	**S**	**G**
2023, China, various	Li et al.	Positive	n/a	n/a	n/a
2023, India, various	Johann et al.	n/a	Negative	Not significant	Positive
2024, India	Kasilingam & Mohanasundaram	Negative	n/a	n/a	n/a

Source: Authors indicated in the first two columns.

2.4 ESG Effect on Banks' Financial Performance

Knowing that a company's financial and stock performance in a market are usually closely related, studies investigating the ESG effect on a bank's financial performance are analyzed. Mahmood, Munim, Shakil, and Tasnia, in their paper, explored how ESG performance is affecting the financial performance of banks (2019). The authors examined data from 93 emerging-market banks and found a significant positive relationship between environmental and social performance and the bank's financial performance (Mahmood et al., 2019). However, the governance effect was not statistically significant (Mahmood et al., 2019). The authors state that

one of the possible explanations is that governance practices in emerging markets are weak in general; for example, “the percentage of female board members is zero among the 93 examined emerging market banks in this study” (Mahmood et al., 2019, p. 1340). Hence, according to the findings, banks and top management should be interested in investing in environmental and social practices and activities to “improve the future cash flow” (Mahmood et al., 2019, p. 1340). Moreover, Buallay, in 2018, examined how ESG disclosure affects a bank’s operational performance (ROA), financial performance (ROE), and market performance (Tobin’s Q). A positive association has been found with environmental factors; Buallay discovered a positive relationship between environmental disclosure and ROE, as well as Tobin’s Q (2018). Meanwhile, the results of Buallays’s study suggest that negative corporate social responsibility disclosure is associated with operational performance, financial performance, and Tobin’s Q (2018). Furthermore, a positive association of governance disclosure with market performance has been observed (Buallay, 2018). However, a negative relationship between governance disclosure and ROA and ROE has been observed (Buallay, 2018). Finally, ESG disclosure, not divided into its factors, has been discovered to enhance a company’s performance – ROA, ROE, and Tobin’s Q (Buallay, 2018).

Moreover, Menicucci and Paolucci investigated ESG’s impact on bank performance in Italy using a solid pool of 150 Italian banks (2023). The authors have discovered that only two of eleven ESG pillar variables were statistically significant in the panel regression investigating ESG influence on banks’ performance (Menicucci & Paolucci, 2023). Waste and emission reductions positively influenced financial and operating performance, hence agreeing with stakeholder theory (Menicucci & Paolucci, 2023). Meanwhile, product responsibility (which is one of the social factors) showed a negative relationship with financial and operational performance (ROE and ROA measures). The geographical scope of this study is only one country; hence, the insights are mostly useful for banks, regulators, and investors in Italy (Menicucci & Paolucci, 2023). The authors also explain that mostly insignificant results of tested ESG pillars might be explained by the fact that banks in Italy “are still away from embracing the right sustainability procedures that generate positive effects on their operational performance and investors’ trust” (Menicucci & Paolucci, 2023, p. 580). Knowing that, when investigating banks/companies in multiple countries, it is wise to include the country’s ESG rating in the equation.

Another study analyzed how ESG practices affect banks' efficiency in the oil-driven economy – Saudi Arabia (Alnori & Shaddady, 2024). The study also focused on a single country bank pool; however, the authors did the analysis by multiple methods (Alnori & Shaddady, 2024). OLS regression and quantile regression analysis showed a negative association between the bank's efficiency and ESG score, while data envelopment analysis (DEA) showed a positive relationship (Alnori & Shaddady, 2024). The authors emphasize that the latter method allows "to compare the joint and separate role of ESG on banks' efficiency" (Alnori & Shaddady, 2024, p. 248). Therefore, this analysis allowed the creation of DEA-generated scores for banks with ESG practices and without, and later to compare them (Alnori & Shaddady, 2024). Also, the authors argue that DAE shows more detailed results than OLS and quantile regression (Alnori & Shaddady, 2024). The CAMELS method was used to evaluate banks, which evaluates a bank's capital adequacy, asset quality, management, earnings, liquidity, and sensitivity (Alnori & Shaddady, 2024).

Table 3

Effects of ESG on Financial Performance – Comparison of Authors

Year, region	Authors	ESG	E	S	G
2019, Emerging markets, banking (ESG performance)	Mahmood et al.	n/a	Positive	Positive	Not significant
2018, Europe, banking (ESG disclosure)	Buallay, A.	Positive	Positive (ROA, Tobin's Q)	Negative (ROA, ROE, Tobin's Q)	Negative (ROA, ROE), Positive (Tobin's Q)
2023, Italy, banking	Menicucci, E., & Paolucci, G.	n/a	Positive (Waste and emission	Negative (Product responsibility	Not significant

(ESG 10 pillars)			reductions on financial and operating performance – ROA and ROE)	on financial and operating performance – ROA and ROE)	
2024, Banking, Saudi Arabia	Alnori, F., & Shaddady, A.	Positive for banks efficiency (by Data envelopment analysis (DEA)); Negative (by OLS regression and quantile regression)	n/a	n/a	n/a

Source: Authors indicated in the first two columns.

Hence, this section observes that both banks' ESG performance and ESG reporting could affect financial and market performance. This suggests that top executives of financial institutions should incorporate ESG into their strategies, as informing investors nowadays is not only obligatory in many cases but could also significantly affect the company's fundamentals (Table 2).

2.5 ESG and Hedging

Some authors have investigated whether ESG impacts stock price volatility during financial distress, and one of the most recent examples is the Covid-19 pandemic. Magubanand and Wesi, in a recent study, investigated the impact of financial services providers' ESG investing on their stock performance in South Africa during the pandemic (2023). They found

that “on average, a 1 percent increase in ESG investing increased stock price returns by 5 percent, ceteris paribus” (Magubane & Wesi, 2023, p. 303). Hence, “ESG investing is a significant resilience factor to shocks in South Africa” (Magubane & Wesi, 2023, p. 311). Also, it is important to note that the relationship was nonlinear, the same as what was observed by Ersoy et al. in 2022 (Magubane & Wesi, 2023). Also, a similar study was performed by Dammak and Moalla; the analysis showed that US stocks with higher ESG ratings demonstrated less volatility during the COVID-19 pandemic (2023).

Moreover, Cho, Kim, and Lee analyzed the impact of ESG on price crash risk in their 2022-year study, providing evidence from South Korea. They analyze companies in three segments: “all companies, multinational companies (MNC), and non-multinational companies (non-MNC)” (Cho et al., 2022, p. 523). Cho et al. discovered the negative relationship between ESG performance and all companies' price crash risk, meaning that better ESG performance positively affected stock returns and prevented stock price crashes (2022). When investigating environmental (E), social (S), and governance (G) factors separately, a negative relationship between the risk and (S) and (E) ratings have been discovered for multinational companies; also, (S) and all companies’ category (Cho et al., 2022).

Furthermore, Boido, Ceccherini, & D'Imperio, in their study, raised the question of whether portfolios of companies with higher ESG ratings (first quartile – 1Q) lead to higher returns than those with low ESG ratings (fourth quartile – 4Q) and also, investigated if there is a difference between the portfolios’ total return, Sharpe ratio, and standard deviation in 5 years and as well in 1-year analysis, “linked to recover phase” (2022, p.19). The results showed that 1Q performed better in all four different rating portfolios (MSCI, Sustainalytics, S&P DJI/Robeco, SXXP) in both 5-year and 1-year periods tested in all three measures – total returns, standard deviation, Sharpe ratio (Boido et al., 2022). For example, in the MSCI portfolio, 5-year Total Return was 93.72% in the top ESG-rated quartile versus 74.63% in the fourth quartile; Standard deviation – 16.21% versus 17.83%; Sharpe Ratio – 0.99 versus 0.78 (Boido et al., 2022, p. 19). Moreover, the 1-year portfolio return was 36.21% in 1Q versus 23.49 in 4Q, the standard deviation was 15.59% in 1Q versus 16.98% in 4Q, and finally, the Sharpe ratio was 2.46 in 1Q versus 1.52 in 4Q (Boido et al., 2022, p. 19). Therefore, “a better ESG profile obtains a higher return, lower risk, and greater efficiency” (Boido et al., 2022, p. 19).

Also, Bhattacharjee P., Bouri, E. & Mishra S. analyzed "the impact of asset-based uncertainty on the asymmetric return connectedness and hedging effectiveness of regional ESG equity markets from January 2017 to December 2022" (2024, p. 2). Bhattacherjee et al. found that regional ESG equity indices contribute significantly to hedging effectiveness against idiosyncratic risk (affecting specific groups of assets) (2024). Moreover, the authors suggested that ESG investments, together with crude oil investments, provide the highest hedging benefit as they are highly negatively correlated. However, the authors discovered that during the COVID-19 pandemic, as well as during the Russia-Ukraine war, it was harder to hedge cross-regionally.

However, Dreyer, Moreira, Smith, and Sharma, in their study, analyzed 2002-2020 returns data of ESG and neutral portfolios (2023). Dreyer et al. suggested that neutral portfolios had higher beta compared to ESG portfolios (systematic risk) (2023). However, the results of asset returns were inconsistent as they highly depended on the rating providers (MSCI vs. Reuters) (Dreyer et al., 2023). Hence, this signals the issue that ESG ratings providers have different methodologies; both researchers and investors should have this in mind and, if possible, compare a few sources when making decisions.

Furthermore, a study performed by D'Ercole and Wagner analyzed how green stocks reacted to the 2023 banking crisis triggered by the collapse of Silicon Valley Bank and the Credit Suisse takeover by UBS (2023). Controversially, the authors did not indicate that environmental technology stocks provided any hedging; they underperformed; meanwhile, the stocks with lower leverage outperformed (D'Ercole & Wagner, 2023). Therefore, this study shows "the inherent vulnerability of green stocks and their sensitivity to financial conditions" (D'Ercole & Wagner, 2023, p. 6). As ESG's impact on banks' returns will be analyzed in this thesis, the "opposite" relationship between the banking industry and green stocks also provides some insight.

Table 4

Effects of ESG on Prevention of Stock Price Crash Risk – Comparison of Authors

Year, region, industry	Authors	ESG	E	S	G
2023, South Africa, financial services providers	Magubane & Wesi	Positive	n/a	n/a	n/a
2022, South Korea, various	Cho, Kim & Lee	Positive (Negative against the risk)	Positive (Negative against the risk)	Positive (Negative against the risk)	Not significant
2022, Europe, various	Boido, Ceccherini, & D'Imperio	Positive (returns, standard deviation, Sharpe ratio)	n/a	n/a	n/a
2024, Europe, the Americas, Asia and the Pacific	Bhattacherjee, P., Mishra, S., & Bouri, E.	Positive (higher hedging effectiveness)	n/a	n/a	n/a
2023, US (years 2002-2020)	Dreyer, J. K., Moreira, M., Smith, W. T., Sharma, V.	Lower Beta, Neutral returns (inconsistent results comparing different source for ratings)	Inconsistent results comparing different source for ratings.	Inconsistent results comparing different source for ratings.	Inconsistent results comparing different source for ratings.

2023, US, (years 2019-2020)	Dammak, S., & Moalla, M.	Positive	n/a	n/a	n/a
2023, 2023 Banking crisis	D'Ercole & Wagner	Negative (Green stocks underperformed)	n/a	n/a	n/a

Source: Authors indicated in the first two columns.

Hence, analyzing the effect of better or worse ESG performance on companies' resilience to financial distress is crucial for top executives, as evidence suggests it is significant. Investing in ESG practices can improve a company's performance during worsening macroeconomic conditions (Table 3). However, the study about environmental technology stocks highlighted green stocks' sensitivity to conditions in the banking industry (Table 3).

2.6 ESG and Non-performing Loans (NPAs)

Another way to check whether a higher ESG score is associated with financial institutions' better performance that could lead to increased and more stable stock prices is to investigate the relationship between ESG score and the ratio of non-performing loans. Kiss, Lippai-Makra, Szládek, & Tóth performed such an analysis in their study in 2021 investigating banks in Europe. The authors used panel regression methods for the study and analyzed the sample of 243 lending institutions from Europe (Kiss et al., 2021). The empirical analysis results have shown that "ESG performance reduced the ratio of non-performing loans significantly" (Kiss et al., 2021, 429). Therefore, such information is also insightful for investors and regulatory bodies - a higher ESG score should result in more financial stability (Kiss et al., 2021). Hence, ESG could and should indicate a bank's financial stability "in addition to the conventional financial indicators" (Kiss et al., 2021, p. 440). Moreover, Jin, Liu, & Nainar recently performed a similar study from commercial banks in the United States (2023). The authors predicted that high ESG rating of banks is associated with fewer non-performing loans, and the results were consistent with the hypothesis:

> Notably, a one-unit increase in ESG score can decrease a bank's nonperforming loan ratio by 0.3% (Jin et al., 2023, p. 6).

Moreover, Gopalkrishnan and Jaiwani analyzed the influence of ESG on bank performance in India separately for public and private sector banks (2023). The authors found that public sector banks show a positive significant relationship between the environmental score, ROE, and nonperforming assets (Gopalkrishnan & Jaiwani, 2023). The exact result was:

> A decrease of 0.161 units in NPAs resulting from a unit increase in the environmental score indicates a potential link between environmental awareness and credit quality in public sector banks (Gopalkrishnan & Jaiwani, 2023, p. 21).

The authors suggested that government-owned banks face stricter environmental regulation and hence have better risk management practices, leading to a lower level of NPAs (Gopalkrishnan & Jaiwani, 2023).

Finally, considering this thesis, we could expect that the stock price fluctuations of a bank with a higher ESG score should be less volatile, as the risks associated with the bank's capital quality (the number of non-performing loans) seem to be lower. Even though ESG is not a financial indicator, it still signals a company's financial stability and resiliency for depositors and investors.

Table 5

Effects of ESG on Non-performing Loans – Comparison of Authors

Year, region, industry	Authors	ESG	E	S	G
2021, Europe, Banking	Kiss, Lippai-Makra, Szládek, & Tóth	Positive (negatively associated with non-performing loans)	n/a	n/a	n/a
2023, United States, Banking	Jin, Liu, & Nainar	Positive (negatively associated with non-	n/a	n/a	n/a

		performing loans)			
2023, India, Banking	Gopalkrishnan, S. & Jaiwani, M.	Not significant	Positive (Public sector banks - positive and significant association - environmental score, return on equity, non-performing assets)	Not significant	Not significant

Source: Authors indicated in the first two columns.

2.7 Investor Reaction to ESG-related News and ESG Transition Risk

In a recent study, Christophe, Hsieh, and Lee analyzed how ESG-related reputation influenced the short-selling of companies' stock and found that poor ESG performance is indeed related to increased aggressive short-selling, which is betting against the company (2024). Moreover, the authors also analyzed how a company's ESG reputation affects the returns of aggressive short-selling (Christophe et al., 2024). They discovered that abnormal positive returns from betting against the stock were present for a group of companies that had long-term positive ESG reputation but experienced recent negative ESG-related news, which, according to the authors, is "consistent with the expectancy violation theory of reputation literature" (Christophe et al., 2024, p. 1). The study is also important because it provides evidence that positive ESG-related news allows the forming of a more positive image for shareholders (Christophe et al., 2024).

Furthermore, another recent study performed in 2024 by Cao, Ge, and Xue showed that investors overreact to the ESG-related transition risks of China's carbon-intensive companies. The authors performed a short-term event study to analyze stock reactions after the 26th United Nations Climate Change Conference of the Parties (COP26) (Cao, Ge & Xue, 2024). The findings showed that the market overreacted, and stock prices plummeted below their

fundamental value, causing a sharp increase later (Cao et al., 2024). The authors state that results show evidence of the salience bias hypothesis – investors tend to focus more on the more recent dramatic events than the long-term trends (Cao et al., 2024). The study is interesting because it emphasizes a very important factor: for some companies, especially carbon sector ones, ESG practices are naturally more challenging to implement, and investors are aware of the transition risks. Moreover, they react or even overreact to it, adding more market volatility.

Hence, there is evidence that ESG-related news can shake up the market, and it is a factor to consider for market participants—companies, investors, and regulators. To avoid market destabilization, the ESG transition should be smooth, calculated, and sustainable.

2.8 Inflation and Stock Prices of Financial Institutions

It has been decided to include inflation as a control variable in the model of this research in the empirical part of this work, as its effect on stock prices is widely investigated and often found statistically significant. Some studies show a positive relationship, while others show a negative one, depending on the region, interest rate environment, current phase of the business cycle, and level of inflation. However, studies with the longest data periods identified a negative relationship. Eldomiaty et al. examined how inflation and real interest rates influence stock prices by analyzing quarterly stock prices of companies listed in NASDAQ100 and the DIJA30 indexes from 1999 to 2016 (2019). The authors found that inflation has a negative impact on stock prices, while interest rates are positively correlated with stock prices (Eldomiaty et al., 2019). Moreover, another study analyzing evidence from 12 countries between 1990 and 2022 identified a negative correlation between expected inflation and stock returns (Chiang, 2023). The author emphasizes that these results support the uncertainty hypothesis, which states that inflation and real stock returns are negatively correlated (Chiang, 2023). In another study, Chiang and Chen analyzed the relationship using evidence from the US market (2023). The authors conducted sectoral analyses and compared different sectors as well as the aggregate (Chiang and Chen, 2023). The results indicated that almost all sectors exhibit a negative relationship, while only the energy sector showed a positive correlation (Chiang and Chen, 2023). Furthermore, inflation-induced equity market volatility demonstrates a negative relationship with stock returns as well (Chiang and Chen, 2023). Therefore, in the empirical part of this work, hypothesis testing of the negative relationship will be presented.

Table 6

Effects of Inflation on Stock returns – Comparison of Authors

Year, evidence	Authors	Stock Returns
2019, NASDAQ100 and DIJA30 indexes, 17 years of data	Eldomiaty et al	Negative
2023, 12 countries, 32 years of data	Chiang	Negative
2023, US market	Chiang & Chen	Negative

Source: Authors indicated on the first two columns.

3. THE EMPIRICAL RESEARCH METHODOLOGY

To examine the extent to which ESG factors affect the stock performance of financial institutions in Europe, a linear panel data regression model is employed. The ESG data for 1,969 financial institutions was obtained from the Bloomberg database. Additionally, stock price data for these same institutions was also sourced from the Bloomberg terminal. European and non-European institutions were identified, with the number of European institutions totaling 453. Yearly inflation data for each country was exported from The World Bank database. The tests were conducted using Gretl statistical software. The investigation covered the period from 2015 to 2022.

3.1.1 Hypotheses of the Thesis

After reviewing the academic literature, the following three hypotheses have been proposed regarding the positive effect of ESG performance on a financial institution's stock return:

H1: A higher Environmental (E) rating positively impacts the stock returns of financial institutions.
H2: A higher Social (S) rating positively impacts the stock returns of financial institutions.
H3: A higher Governance (G) rating positively impacts the stock returns of financial institutions.

3.1.2 Data Type

In any empirical study, it is crucial to select an appropriate dataset that can effectively test the hypotheses. Since the hypotheses presented in this thesis require cross-sectional data across multiple time periods, tests suitable for panel data will be employed (Baltagi, 2021). According to Baltagi, micro-panel and macro-panel data should be handled differently in econometrics; therefore, it is vital to identify which dataset is being used for the research (2021). While micro-panel data often has a large N over a smaller T (ranging from 2 to 20 years), macro-panel data may contain only a few N but usually spans 20 to 60 years; micro-panel data typically observes individuals or individual entities, whereas macro-panel data examines aggregates, most commonly countries (Baltagi, 2021). Hence, the dataset used in this study is considered micro

panel data as the observations are of financial institutions. Therefore, econometric models and tests applicable for micro panel data will be used.

3.1.3 Description of Dataset

The data for the Environmental, Social, and Governance pillars was retrieved from Bloomberg. The dataset is unbalanced, as a balanced dataset requires that all entities be presented in all periods. This is not the case for this dataset. Bloomberg offers separate datasets for the Governance pillar and one for Environmental and Social combined. Banks in both lists are different and cannot be fully mapped.

The main challenge for this empirical research was combining multiple datasets, mapping, and transforming the data so tests could be effectively run with enough observations to test the hypotheses. The first dataset exported from the Bloomberg terminal included environmental and social factors for financial institutions. The second dataset exported from the Bloomberg terminal contained information on Governance factors. The third dataset exported from the Bloomberg terminal had stock price data for the banks in the first two datasets. The financial institution country (available information on Bloomberg) was mapped to the Europe/Non-Europe country list. Also, it was mapped to the country's annual inflation data. As the bank list on the E and S datasets mostly differed from the G dataset, it has been decided to run two separate regressions for these datasets, as combining these would create a highly unbalanced dataset.

Furthermore, the data is not fully balanced for two other reasons. Stock price data was not fully available for all years for all cross-sectional units, and the availability of ESG pillar scores differs by financial institution.

Gretl statistical software accounts for such cases, and regressions can still be run. However, it is important to understand that the number of observations used for regressions decreases. Moreover, various statistical tests will be run to determine the model's data usability.

3.1.4 Dependent Variable

As the stock prices are observed daily, and the frequency of Bloomberg ESG ratings data is yearly, the yearly return of each bank stock price should be calculated using the formula:

$$Total\ Stock\ Return = \frac{(P1 - P0) + D}{P0}$$

Where:

P0 = Initial stock price

P1 = Ending stock price at the end of the year

D = Dividends

As it is possible to export stock price data with adjusted dividends from the Bloomberg terminal, the below is used:

$$Total\ Stock\ Return\ (r) = \frac{(P1 - P0)}{P0}$$

Where:

P0 = Adjusted initial stock price

P1 = Adjusted ending stock price

The hypotheses were raised referring to the research of the authors that evaluated ESG influence on banks' performance in recent years (Ersoy et al., 2022; Fiordelisi et al., 2023; M.M. Miralles-Quirós et al., 2019; Thornton & Tommaso, 2020). Even though the results in some cases were inconsistent, the hypotheses raised in the authors' works guessed positive stock returns/financial performance and ESG performance relationship (Ersoy et al., 2022; Fiordelisi et al., 2023; M.M. Miralles-Quirós et al., 2019; Thornton & Tommaso, 2020).

3.1.5 Description of All Variables

The table below summarizes all the variables used in the model. For the panel data regressions, the Environmental, Social, and Governance pillars will be used. In addition, to adjust for inflation, an inflation-independent variable has been included. The dependent variable is Stock return, which was calculated using Bloomberg stock price data.

This academic research does not include a combined ESG score in the model, as only E&S and G datasets were available to export at the time of this research. Theoretically, it is possible to combine the three pillars and create an ESG index, but it has been decided not to proceed with this idea since actual Bloomberg scores include different weightings for different companies, considering the specifics of each company and pillar's financial materiality.

Table 7

Definition of Variables

Type	Independent Variable	Description	Source	Expected Relationship – Stock Return
Independent	Environmental pillar	One of three ESG pillars	Bloomberg ESG ratings (Bloomberg Terminal)	Positive
Independent	Social pillar	One of three ESG pillars	Bloomberg ESG ratings (Bloomberg Terminal)	Positive
Independent	Governance pillar	One of three ESG pillars	Bloomberg ESG ratings (Bloomberg Terminal)	Positive
Independent	Inflation	Consumer price inflation, annual	The World Bank Data	Negative
Dependent	Stock Return	Stock return calculated using	Bloomberg terminal	n/a

	Bloomberg stock data

Source: Not applicable.

3.1.6 Sample and Subsample

For this academic research, a linear panel data regression model is used. The ESG data of 1969 financial institutions was retrieved from the Bloomberg database. Moreover, the stock price data for the same institutions was also retrieved from the Bloomberg terminal. European and non-European institutions were identified. The number of European institutions is 453. Moreover, yearly inflation data for each country has been exported from The World Bank inflation database. The tests were run using Gretl statistical software. Finally, the period investigated was 2015 – 2022, as at the time of this research, the ESG scores for 2023 were not yet available on the Bloomberg terminal. ESG ratings are annual; hence, this is the frequency of periods used for the data. The World Bank inflation dataset also contains yearly data. Finally, the exported stock price data was daily. Therefore, it has been decided to use the last day of the year as the annual stock price, not the average or any other form, assuming a one-year hold period. The main focus of this research is European financial institutions; however, due to the decreased number of observations because of the unbalanced data, it has been decided to compare the results to the test run on the non-Europe dataset to achieve a better comparison of a Europe/non-Europe factor. As the panel fixed effects model excluded this variable due to exact collinearity, the approach to run two separate regressions has been chosen for the comparison. This approach is known as using a subsample (Hsiao, 2007).

3.1.7 Panel Data Analysis And Final Regression

After analysis of academic literature, it has been decided to build a panel data regression:

$$RETURNS_t = \beta_0 + \beta_1 x\ ENVIRONMENTAL\ PILLAR_t + \beta_2 x\ SOCIAL\ PILLAR_t + \beta_3 x\ GOVERNANCE\ PILLAR_t + \beta_4 x\ INFLATION + \varepsilon_t$$

Due to the specifics of the employed dataset, the equation has been divided into two separate ones:

1) $RETURNS_t = \beta_0 + \beta_1 x\ ENVIRONMENTAL\ PILLAR_t + \beta_2 x\ SOCIAL\ PILLAR_t + \beta_3 x\ INFLATION + \varepsilon_t$

1) $RETURNS_t = \beta_0 + \beta_1 x\ GOVERNANCE\ PILLAR_t + \beta_2 x\ INFLATION + \varepsilon_t$

Hence, the key question of this thesis is if and how ESG performance affects financial institutions' stock returns will be answered by employing the equations. Furthermore, the authors discussed in the analysis of academic literature mostly used panel regression; some analyzed fixed effects, some – random, and a few researchers employed vector autoregression. In this study, panel regression is used as it was the most popular method among researchers analyzed. Also, the Hausman statistical test is performed to determine whether the fixed effects or random effects model is more appropriate (Clark, T.S., Linzer, 2015; Basel & Schmidheiny, 2011). Fixed effects regression assumes that differences across financial institutions are captured by company-specific intercepts (controls for unobserved heterogeneity), which do not vary over time and are fixed (Clark, T.S., Linzer, 2015; Basel & Schmidheiny, 2011). This can be explained by the formula below:

$$Y_{it} = a_i + \beta_1 X_{it} + \varepsilon_{it}$$

Where:

a_i is a unique intercept for each entity i.

Meanwhile, under the random effects model, the assumption is that unobserved heterogeneity is uncorrelated with explanatory variables and random. Also, it treats company-specific effects as part of the error term (Clark, T.S., Linzer, 2015; Basel & Schmidheiny, 2011). This can be explained by the formula below:

$$Y_{it} = a + \beta X_{it} + u_i + \varepsilon_{it}$$

Where:

u_i is the random effect for entity i, assumed to be uncorrelated with X_{it}.

For the fixed effects, Gretl statistical software does not show individual intercepts in the final equation; instead, it accounts for them (Wooldridge, 2010; Gretl, n.d). While each entity technically has its own intercept, these are absorbed into the fixed effects transformation and are

not reported in the regression output (Wooldridge, 2010; Gretl, n.d). The intercept shown in the regression is a common intercept after the fixed effects transformation, but this doesn't mean individual entity intercepts are the same (Wooldridge, 2010; Gretl, n.d). The fixed effects model in Gretl uses a "demeaning approach," also known as "within the transformation," so this transformation subtracts the entity-specific means (averages over time) of all variables from their individual observations (Wooldridge, 2010; Gretl, n.d). This way, the regression focuses only on the variation within entities over time, effectively removing the influence of time-invariant entity characteristics (like entity-specific intercepts) (Wooldridge, 2010; Gretl, n.d).

3.1.8 Additional Calculation of Annual Returns Standard Deviation

Similarly to the Boido et al. study in 2022, which was discussed in the analysis of the scientific literature of this thesis, the companies will be divided into quartiles according to their stock return standard deviation. Then, the average of each quartile will be calculated for the Environmental, Social, and Governance scores. It will be compared to each group's average standard deviation and stock returns. The annual standard deviation for the individual entities will be calculated using annual return values. Hence, the standard deviation for each quartile will be calculated using the formula below:

$$Standard\ Deviation\ of\ Sample\ (s) = \sqrt{\frac{\sum(X - \overline{X})^2}{n - 1}}$$

Where:

X = Each annual return

$\bar{X}$ = The mean of the annual returns

n = Number of years (eight in this case)

As the panel dataset used in this research is unbalanced and not all financial institutions have ESG pillar values for all eight years, companies with less than six years of data will be excluded from this additional analysis.

The expected result refers to the research of the authors that evaluated ESG hedging effectiveness in recent years (Bhattacherjee et al., 2024; Boido et al., 2022; Cho et al., 2022; D'Ercole & Wagner, 2023; Dreyer et al., 2023; Magubane & Wesi, 2023). Even though the results in some cases were inconsistent, the hypotheses raised in the authors' works guessed

negative volatility/risk and ESG performance relationship (Bhattacherjee et al., 2024; Boido et al., 2022; Cho et al., 2022; D'Ercole & Wagner, 2023; Dreyer et al., 2023; Magubane & Wesi, 2023).

4. THE EMPIRICAL RESULTS ANALYSIS

4.1.1 Descriptive Statistics and Trends

To investigate the trends of Environmental, Governance, and Social pillar results during the period of 2015 to 2022, average, maximum, minimum values, and standard deviation were calculated for the sample (Europe) and subsample (non-Europe) of the data each year. In addition, the count of cross-sectional units each year is presented to show the distribution of observations in the unbalanced panel dataset employed for this research.

First, as presented in the first Table, the European dataset observations for the Governance dataset fluctuated from 147 to 438 during the years from 2015 to 2022. Meanwhile, the number of observations for the Social dataset varied from 25 to 53 during the same period (Table 8). Finally, the Environmental scores are counted from 21 to 47, for the same time period (Table 8).

Table 8

Europe: Count of Environmental, Social and Governance scores

Year	Count of Governance	Count of Social	Count of Environmental
2015	147	25	21
2016	151	26	23
2017	156	27	24
2018	161	27	25
2019	163	27	25
2020	163	28	28
2021	438	53	47
2022	316	50	47

Source: Calculated using Bloomberg data

Moreover, as presented in Table 9, the non-European dataset observations for the Governance dataset fluctuated from 608 to 1448 during the years 2015 to 2022. Meanwhile, the count of observations for the Social dataset varied from 44 to 66 during the same period (Table 9). Finally, the count of Environmental scores is from 24 to 64 – the same time period (Table 9).

Table 9

Non-Europe: Count of Environmental, Social and Governance scores

Year	Count of Governance	Count of Social	Count of Environmental
2015	608	44	24
2016	631	44	25
2017	661	44	28
2018	681	45	35
2019	698	45	38
2020	699	45	42
2021	1448	65	59
2022	1191	66	64

Source: Calculated using Bloomberg data

Therefore, when interpreting the results, it is worth emphasizing the dataset's imperfection. If possible, a more balanced dataset should be studied for future research. However, the above is used for the purpose of this thesis.

Bloomberg ESG score range is from 0 to 10, and the higher scores indicate better performance (Bloomberg Adria, n. d.). The table below presents the average Environmental, Social, and Governance scores of the European sample (Table 10). It could be easily identified that Governance scores for financial institutions remained quite constant during the period from 2015 to 2022, ranging from 5.287 in 2021 to 6.452 in 2020 (Table 10). Meanwhile, the Social and Environmental average varied more with the upward trend (Table 10). The Social score more than doubled comparing the years from 2015 to 2022 (Table 10). Furthermore, the Environmental score increased almost four times during the same period (Table 10). This suggests that aspects such as corporate governance, transparency, shareholder rights, ethical practices, and risk management remained comparatively constant for this pool of financial institutions in Europe from 2015 to 2022 (Table 10). Contrastingly, the aspects such as human rights, diversity and inclusion, labor practices, community engagement, and product responsibility improved more (Social factor) (Table 10). Finally, this data suggests that efforts to

decrease climate change impact, resource use, waste management, biodiversity, and renewable energy have increased the most (Environmental factor) (Table 10).

Table 10

Europe: Average Environmental, Social, and Governance scores

Year	Average of Governance	Average of Social	Average of Environmental
2015	5.750	1.944	1.264
2016	5.918	2.311	1.402
2017	6.031	2.623	1.697
2018	6.112	3.238	1.873
2019	6.275	3.469	2.463
2020	6.452	4.426	3.083
2021	5.287	3.755	4.246
2022	5.597	4.608	4.934

Source: Calculated using Bloomberg data

For the non-European subsample, similar trends could be identified (Table 11). First, the Governance factor remained comparatively high and constant (Table 11). Moreover, the Social score increased approximately 2.4 times. Finally, the environmental score increased approximately 4.4 times – the highest of all three factors (Table 11).

Table 11

Non-Europe: Average Environmental, Social and Governance scores

Year	Average of Governance	Average of Social	Average of Environmental
2015	5.499	2.165	1.113
2016	5.566	2.412	1.432
2017	5.572	2.735	1.800
2018	5.614	3.416	2.205
2019	5.720	4.258	2.438
2020	5.768	4.834	3.098
2021	5.583	4.845	4.329
2022	5.655	5.234	4.947

Source: Calculated using Bloomberg data

Also, the standard deviation from the mean has been calculated for the sample and for the subsample. First, for the European entities, the standard deviation for the Governance factor during the period of the research fluctuated from 1.2 to 1.9 with an average of 1.4 (Table 12). Moreover, the standard deviation for the Social factor fluctuated from 1.5 to 2.3 with an average of 1.8 (Table 12). Finally, the standard deviation for the Environmental factor fluctuated from 1.5 to 2.1 with an average of 1.9 (Table 12). If we compare to the averages discussed above, we could conclude that the deviation is quite high. A high standard deviation of ESG scores indicates that there is significant variability in how different entities perform in their Environmental, Social, and Governance practices. It could potentially imply diverse ESG practices, countries, or other specific factors. Hence, this does not contradict the statement that more research is necessary in the field of ESG. For example, for investors, knowing the drivers behind the variability would help to identify trends and opportunities, and knowing how significant this variability is for the investment returns would also provide some insights. Also,

for financial institutions, high variability within the industry may highlight areas needing improvement. Finally, for the regulators and advocates, this variability could be an indicator of the need for standardized ESG frameworks and or even benchmarks.

Table 12

Europe: Standard deviation of Environmental, Social, and Governance scores.

Year	StdDev of Governance	StdDev of Social	StdDev of Environmental
2015	1.404	1.509	1.628
2016	1.339	1.498	1.509
2017	1.296	1.479	1.879
2018	1.305	1.695	1.891
2019	1.250	1.785	1.822
2020	1.220	2.232	1.973
2021	1.866	2.318	2.121
2022	1.751	2.231	2.082

Source: Calculated using Bloomberg data

Furthermore, for the non-European entities, the standard deviation for the Governance factor during the period of the research fluctuated from 1.4 to 1.6 with an average of 1.5 (Table 13). Moreover, the standard deviation for the Social factor fluctuated 1from .5 to 2.2 with an average of 1.9 (Table 13). Finally, the standard deviation for the Environmental factor fluctuated from 1.6 to 2.6 with an average of 2.17 comparing years from 2015 to 2022 (Table 13).

Table 13

Non-Europe: Standard deviation of Environmental, Social and Governance scores

Year	StdDev of Governance	StdDev of Social	StdDev of Environmental
2015	1.576	1.460	1.598
2016	1.542	1.635	1.599
2017	1.554	1.653	2.096
2018	1.574	1.850	2.469
2019	1.559	1.966	2.570
2020	1.568	1.992	2.407
2021	1.476	2.125	2.266
2022	1.378	2.171	2.320

Source: Calculated using Bloomberg data

For the pool of European financial institutions, average adjusted stock price growth (comparing end-year values) varies widely from 2015 to 2022. The highest average is observed in 2021, which is 38.8 % (Table 14). It is worth highlighting that the year 2017 also showed a high 38.0 % average growth (Table 14). Moreover, the highest average observed growth for the comparison non-Europe subsample is also in 2017 (22.7 %) and 2021 (20.4%) (Table 15). It might be possible to explain that in 2017, according to the International Monetary Fund World Outlook, the global economy grew with major economies like the United States, China, and the Eurozone expanding simultaneously (2017). This boosted consumers and investors' confidence. Moreover, the S&P 500 in 2017 was very stable, with historically low volatility, which was also reflected in investor confidence (Oyedele, 2017). Regarding the end of 2021, many economies were recovering from the COVID-19 pandemic, supported by fiscal and monetary stimulus. Central banks kept Interest rates low, encouraging borrowing and investment (ECB, n. d.; Trading Economics, n. d.).

The rest of the descriptive statistics are presented in Annex 4.

Table 14

Europe: Average of Stock Price Data

Year	Average of Stock Price Growth
2015	1.90%
2016	-2.78%
2017	**37.98%**
2018	**-17.68%**
2019	15.40%
2020	1.76%
2021	**38.81%**
2022	**-17.89%**

Source: Calculated using Bloomberg data

Table 15

Non-Europe: Average of Stock Price Data

Year	Average of Stock Price Growth
2015	-1.63%
2016	15.07%
2017	**22.70%**
2018	**-15.38%**
2019	18.14%
2020	-2.73%
2021	**20.36%**
2022	**-10.14%**

Source: Calculated using Bloomberg data

For both the European sample and the non-European subsample, negative growth was observed in 2022, indicating that stock prices generally plummeted. The key events contributing to this drop in stock prices include a combination of rising inflation, increased central bank tightening, recession fears, the ongoing war between Russia and Ukraine, and declining corporate profits (KPMG, 2022). Together, these factors created an environment of increased uncertainty and risk aversion, leading to a significant market downturn sell-off.

Moreover, for both the European sample and the non-European subsample, years of the highest growth (2017 and 2021) also presented the highest volatility (Tables 14-17). In Europe, the second highest standard deviation of 107.5% was observed in 2017, and the highest in 2021 - 342.34%, which indicated extraordinary volatility (Table 16). In non-Europe as well - the second highest standard deviation of 105.5% was observed in 2017, and the highest in 2021 - 119.7% (Table 17). Furthermore, in Europe, the second lowest volatility of 27.7 % was observed in 2022 while the lowest was 24.0 % in 2018 (Table 9). In non-Europe – very similar – financial institutions in this subsample in 2015, 2018, and 2021 presented the lowest volatility with standard deviation varying from 27.7% to 31.8% (Table 17). The count of financial institutions in the European and the Non-European samples each year of the research is presented in Annex 2.

Table 16

Europe: Standard deviation of Stock Price Data

Year	StdDev of Stock Price Growth
2015	35.32%
2016	42.64%
2017	**107.53%**
2018	**23.99%**
2019	35.31%
2020	43.35%
2021	**342.34%**
2022	**27.68%**

Source: Calculated using Bloomberg data

Table 17

Non-Europe: Standard deviation of Stock Price Data

Year	StdDev of Stock Price Growth
2015	**31.28%**
2016	50.00%
2017	**105.51%**
2018	**27.73%**
2019	58.71%
2020	48.77%
2021	**119.70%**
2022	**31.84%**

Source: Calculated using Bloomberg data

Hence, 2021 mostly reflect market's chaotic nature in response to pandemic of COVID-19, government responses, and high market speculation. Moreover, this dataset shows that financial institutions' stock price volatility might vary quite significantly which is totally logical knowing how sensitive world's economy is to financial institutions performance and failures (2008 crisis, for example).

Furthermore, the financial institutions from European sample for which six to eight years for ESG pillar data were present were evaluated by average annual standard deviation during the research period and divided into four quartiles. Then, it was compared to the average pillar score for that quartile to check how volatility and pillar score compares.

It has been learned that the highest standard deviation was associated with the highest Environmental Pillar average and the second highest stock return (Table 18). Moreover, the lowest Environmental pillar is associated with the lowest stock return (Table 18). Furthermore, the highest stock return is associated the second Environmental pillar score (Table 18). Finally, the lowest standard deviation seems to be associated with the highest stock return in the calculation, however, as discussed before volatility varied by year, hence, the aggregate data should be interpreted carefully (Table 16, Table 18).

Table 18

Europe: Standard Deviation Average, Environmental (E) Pillar Average, Stock Return Average. 1 means the highest, 4 means the lowest. Years 2015-2022.

Quartile	Standard Deviation Average	E Pillar Average	Stock Return
I	1	1	2
II	2	4	4
III	3	3	3
IV	4	2	1

As Values:

Quartile	Standard Deviation Average	E Pillar Average	Stock Return
I	35.69%	3.61	1.06%
II	26.40%	2.11	-1.73%
III	20.10%	2.20	0.56%
IV	15.21%	3.16	5.43%

Source: Calculated using Bloomberg data

Moreover, the highest Social Pillar score was associated to both, the highest standard deviation and the highest stock return (Table 19). The last three quartiles for S score do not seem to be very directly related to the stock returns using this comparison method. Lowest deviation seems to be related to the lowest S pillar average (Table 19).

Table 19

Europe: Standard Deviation Average, Social (S) Pillar Average, Stock Return Average. 1 means the highest, 4 means the lowest. Years 2015-2022.

Quartile	Standard Deviation Average	S Pillar Average	Stock Return
I	1	1	1
II	2	3	4
III	3	2	3
IV	4	4	2

As Values:

Quartile	Standard Deviation Average	S Pillar Average	Stock Return
I	37.96%	4.20	7.64%
II	28.45%	3.25	-8.02%
III	20.75%	3.69	0.93%
IV	15.69%	3.15	4.17%

Source: Calculated using Bloomberg data

Finally, as presented in the Table 20, the highest G score seems to be related to the lowest stock return, and the lowest G score seems to be related to the highest stock return which suggests inverse relationship (Table 13). The highest standard deviation seems to be associated with the lowest G score (Table 13). However, as discussed before, the G score seemed to grow less than other 2 pillars and, moreover, the difference between the highest two quartiles in terms of G score (II and IV) present a very low difference. Therefore, more complicated model, such as panel data regression should be developed to investigate this.

Table 20

Europe: Standard Deviation Average, Governance (G) Pillar Average, Stock Return Average. 1 means the highest, and 4 means the lowest. Years 2015-2022.

Quartile	Standard Deviation Average	Governance Pillar Average	Stock Return
I	1	4	1
II	2	1	4
III	3	3	2
IV	4	2	3

As Values:

Source: Calculated using Bloomberg data

4.1.2 Stationarity of Numeric Variables

Stationarity for numeric variables is checked to determine if a first difference should be used. If variables are trended over time, and these trends are not explicitly modeled, the regression coefficients may reflect shared trends rather than actual relationships (Baltagi, 2021). The stationarity of variables has been tested using the KPSS test; KPSS has a null hypothesis that data is stationary (Gretl, n.d). As E, S, and G pillar scores are not present for all time points, KPSS could not be run for all cross-sectional units; hence, it was decided to use only the cross-sectional units with all 8 years of data.

For Europe:

- Stock Returns – stationary with some interpolated p-values and rejected for one unit – not needed to use the first difference (Annex 3)
- Inflation – stationary with some interpolated p-values and rejected for one unit – not needed to use the first difference (Annex 3)
- Environmental pillar – most of the units are non-stationary; hence, the first difference will be used (Annex 3)
- Social pillar – most of the units are non-stationary. Hence, the first difference will be used (Annex 3)
- Governance pillar – most of the units are non-stationary. Hence, the first difference will be used (Annex 3)

For non-Europe:

- Stock Returns – stationary with some interpolated p-values – not needed to use the first difference (Annex 3)
- Inflation – stationary with some interpolated p-values and rejected for low amount of not stationary – not needed to use the first difference (Annex 3)
- Environmental pillar – most of the units are non-stationary; hence, the first difference will be used (Annex 3)
- Social pillar – most of the units are non-stationary/interpolated p values. Hence, the first difference will be used (Annex 3)
- Governance pillar – most of the units are non-stationary/interpolated p values. Hence, the first difference will be used (Annex 3)

The first difference for the pillar values for the European cross-sectional units (sample) presented stationarity. Also, the first difference for the pillar values for the non-European cross-sectional units (subsample) presented stationarity. Therefore, stock returns and inflation variables will be used in their original form, while the first difference will be used for the pillar variables. Therefore, the interpretation of the final equation will change accordingly.

4.1.3 Correlation Between Variables

Correlation between variables is presented in the correlation matrix in Tables 21-24. A strong negative correlation is considered between -0.5 and -1, while a strong positive correlation is considered between 0.5 and 1. Too high correlations between independent variables might indicate multicollinearity; such an issue in the matrices has not been observed. As separate regressions will be run for European and non-Europe data and a separate Governance Pillar and a separate Environmental Pillar within the sample and sub-sample, correlations were also checked in the four separate tables (Tables 21-24).

Table 21

Europe – G Pillar regression sample. Correlation coefficients were calculated using the observations 1:1 - 453:7. Missing values were skipped. 5% critical value (two-tailed) = 0.0326 for n = 3623.

Stock Return	**Governance**	**Inflation**	
1.0000	-0.0253	-0.0391	**Stock Return**
	1.0000	-0.1509	**Governance**
		1.0000	**Inflation**

Source: Calculated using Bloomberg data and Gretl statistical software

Table 22

Europe – E and S Pillar regression sample. Correlation coefficients were calculated using the observations 1:1 - 53:8. Missing values were skipped. 5% critical value (two-tailed) = 0.0952 for n = 424.

Stock Return	**Environmental**	**Social**	**Inflation**	
1.0000	-0.0703	0.0879	-0.1755	**Stock Return**
	1.0000	0.1404	0.4546	**Environmental**
		1.0000	0.3069	**Social**
			1.0000	**Inflation**

Table 23

Non-Europe – G Pillar regression sample. Correlation coefficients were calculated using the observations 1:7 - 1516:8. Missing values were skipped. 5% critical value (two-tailed) = 0.0178 for n = 12122.

Stock Return	**Governance**	**Inflation**	
1.0000	-0.0053	-0.0151	**Stock Return**
	1.0000	-0.1003	**Governance**
		1.0000	**Inflation**

Table 24

Non-Europe – E and S Pillar regression sample. Correlations were calculated coefficients, using the observations 1:7 - 66:8. Missing values were skipped. 5% critical value (two-tailed) = 0.0858 for n = 522.

Stock Return	**Environmental**	**Social**	**Inflation**	
1.0000	0.0175	0.0241	-0.0750	**Stock Return**
	1.0000	-0.0754	0.2859	**Environmental**
		1.0000	0.3796	**Social**
			1.0000	**Inflation**

The correlation matrix presents a linear relationship between two variables without accounting for other variables in the model; therefore, regression will be run; the purpose of the above was solely to check for possible multicollinearity.

4.1.4 Test for Poolability

Multiple tests should be run to test the data and model fit to run the panel data regression. First, the data set was loaded to Gretl and poolability was checked – it shows if data has a common intercept and if pooled regression fits or the fixed effects model (FEM) or random effects model (REM) should be used instead. Pooled regression assumes no unobserved heterogeneity. Meanwhile, FEM allows for unit-specific intercepts to account for unobserved heterogeneity, and REM assumes unit-specific effects are random and uncorrelated with the independent variables (Baltagi, 2021).

In Gretl, the test for differing group intercepts was run to test poolability. The null hypothesis stated that the groups have a common intercept. Results are presented in Table 25. One of the three datasets indicated that data is not poolable at a 0.10 significance level. The pooled OLS model won't be used as heterogeneity was assumed in most of the research analyzed, and fixed or random effects models were more popular; however, as the sample suggests, it might be considered (Table 19).

Table 25

Poolability Test Results

Europe – E&S sample	Europe – G sample	Non-Europe – E&S sample	Non-Europe – G sample
p-value = 0.874455 (poolable)	p-value = 1 (poolable)	p-value = 0.0982669 (not poolable at 0.10 significance level)	p-value = 1 (poolable)

Source: Calculated using Bloomberg data and Gretl statistical software

4.1.5 Test for Random vs. Fixed Effects – Hausman Test

Moreover, to determine whether the fixed or random effects model should be used, the Hausman test was performed. In Gretl, the null hypothesis is that GLS estimates are consistent; hence, if not rejected, the Random effects model should be used; if rejected with a low p-value, the Fixed effects model should be used. The results and interpretation are presented in Table 26. Even though the number of observations is limited, the following suggests that, in Europe, the characteristics of each financial institution, like country, laws, culture, and economic system, are unique and significantly influence the outcomes. The fixed effects model acknowledges that these specific by-country factors are important and controls for them. According to the test, differences outside Europe can be treated as random variations. For future research, it would be interesting to investigate non-Europe divided into samples such as APAC, LATAM, and Americas. However, it is not within the scope of this thesis.

Table 26

Hausman Test Results

Europe – E&S sample	Europe – G sample	Non-Europe – E&S sample	Non-Europe – G sample
p-value = 0.00154684, rejected, suggested Fixed effects model is more appropriate	p-value = 0.0177831, this indicates that the result is statistically significant at the 5% level. The result is not statistically	p-value = 0.280276, not rejected, suggested Random effects model should be more appropriate	p-value = 0.125771, not rejected, suggested Random effects model should be more appropriate

	significant at the 1% level. Fixed effects model is probably more appropriate for the data because the random effects model's assumption of no correlation between the individual effects and the regressors is likely to be violated.		

Source: Calculated using Bloomberg data and Gretl statistical software

4.1.6 Tests and Final regression – Europe E&S

The final fixed effects model for the Europe E&S sample is shown (Appendix 5):

- The constant term (intercept) is 0.0317, but it is not statistically significant at the 5% level (p = 0.1823).
- The coefficient for d_Environmental is 0.0407, with a p-value of 0.0252. This suggests a significant positive effect on stock return (significant at the 5% level).
- The coefficient for d_Social is -0.0093, but it is not statistically significant (p = 0.4442), indicating no significant effect.
- The coefficient for Inflation is -2.085, with a p-value of 0.0042. This suggests a significant adverse effect on stock return (significant at the 1% level).

HAC standard errors in Gretl have been applied, making the model more robust to autocorrelation and heteroskedasticity. Thus, even with a Durbin-Watson statistic is above 2.5, the results from the fixed-effects model can be interpreted.

The model fit could be interpreted by:

- The LSDV R-squared is 0.365, indicating that the model explains 36.5% of the variation in the dependent variable.
- The Within R-squared is 0.072, indicating the variation explained within units.
- The Durbin-Watson statistic is 2.59, suggesting no significant (but mild) autocorrelation exists in the residuals. For this, HAC has been applied.
- Wald test for heteroskedasticity indicated heteroscedasticity. For this, HAC has been applied.
- The normality of the residuals was confirmed. The hypothesis failed to be rejected at the 5% significance level. A Q-Q plot and frequency distribution diagram are also present in Annex 5.
- Joint test on named regressors - indicating that the regressors jointly have a meaningful impact on the dependent variable.

4.1.7 Tests and Final Regression – Europe G

The final fixed effects model for the Europe G sample showed (Appendix 6):

- Constant (Intercept): The intercept coefficient is 0.0261, with a p-value of 0.0373, suggesting that it is statistically significant at the 5% level. This indicates that the baseline effect on stock return is positive.
- Inflation: The coefficient for inflation is -1.2398, with a p-value of 0.0030, indicating a statistically significant negative effect on stock return at the 1% level. This suggests that higher inflation is associated with lower stock price growth.
- d_Governance: The coefficient for d_Governance is 0.0097, but the p-value is 0.7302, indicating that governance does not have a statistically significant effect on stock return.

The model fit could be interpreted by:

- Within R-squared: 0.0076, which is very low, indicating that the model explains very little of the within-group variation in stock price growth.
- LSDV R-squared: 0.2658, which suggests that the model accounts for about 26.6% of the variance in stock price growth when considering the fixed effects.

- Durbin-Watson Statistic: 2.54, which is close to 2, suggesting no significant (but mild) autocorrelation in the residuals.
- Joint test on named regressors: The F-test shows a p-value of 0.0121, which is significant, suggesting that inflation and d_Governance jointly affect stock price growth.
- Robust Test for Differing Group Intercepts: The test statistic is 0.6069 with a p-value of 1, indicating no evidence of differing group intercepts across the cross-sectional units.
- Heteroscedasticity and autocorrelation issues were detected; for this, HAC has been applied.

Therefore, inflation has a significant negative effect on stock return, while governance does not have a statistically significant impact. The G model fit is relatively weak in explaining the variation in stock returns, particularly within groups (cross-sectional units), and could be improved in future research.

4.1.8 Tests and Final Regression – Non-Europe Subsample

The final random effects model for the non-Europe E&S and Europe G sample showed (Annexes 7-8):

- **Constant (Intercept)**: The intercept coefficient is 0.1049, with a p-value of 0.0005, suggesting that the constant is statistically significant at the 1% level. This indicates that the baseline effect on Stock Return is positive.
- **Inflation**: The coefficient for inflation is -1.4067, with a p-value of 0.0790, which suggests a marginally significant negative relationship with Stock Return at the 10% level. This indicates that higher inflation may have a negative effect on stock price growth.
- **d_Environmental**: Environmental factors do not have a statistically significant effect on Stock Return.
- **d_Social**: Social factors do not have a statistically significant effect on Stock Return.
- **d_Governance**: Governance factors do not have a statistically significant effect on Stock Return.

The full model and tests were presented in Annexes 7-8.

4.1.9 Final Interpretation of Models

The significant coefficients could be interpreted as follows:

- E (European sample). The coefficient for d_Environmental is 0.0407. In Europe, if the difference in the Environmental pillar for a financial institution increases by one score, its stock return should increase by 4.07% annually.
- Inflation (European E&S sample). The coefficient for inflation is -2.085. In Europe, if the inflation in the country where the financial institution is based changes by 1%, the annual stock return for that financial institution would decrease by 2.09%.
- Inflation (European G sample). The coefficient for inflation is -1.2398. In Europe, if the inflation in the country where the financial institution is based changes by 1%, the annual stock return for that financial institution would decrease by 1.23%.
- Inflation (non-European E&S sample). The coefficient for inflation is -1.4067. In non-European countries, if the inflation in the country where the financial institution is based changes by 1%, the annual stock return for that financial institution would decrease by 1.41%.

Therefore, the expected positive significant relationship has been detected between the European financial institution's Environmental Pillar score and the financial institution's annual stock return. Compared to the sub-sample (non-European countries), European financial institutions' stock return is more sensitive to changes in the company's Environmental Pillar score, as the results were significant for the European sample only. With a significant growing awareness of ESG frameworks in Europe, the result is not surprising. Moreover, the Environmental pillar is now a major focus due to its urgency and global impact, considering the climate change and net-zero targets.

5. CONCLUSIONS AND RECOMMENDATIONS

The ESG concept was first mentioned in the UN "Who Cares Wins" report released in 2004. Moreover, in 20 years, the idea became more popular, and many guidelines became regulations. For example, in the EU, the EU Green Deal was introduced in 2019, containing various ESG regulations. Their key goals are the creation of more sustainable markets, increased trust in financial institutions and other companies, the introduction of sustainability as a tool for risk management, the encouragement of sustainable investments, and the informing of stakeholders.

CSR theory is considered to be the origin of the ESG concept. For example, Porter in 1991 emphasized the idea of sustainable financial performance as a part of the company's strategy. Moreover, some debates have been presented about whether companies should follow the stockholder or stakeholder theories when considering the approach and strategy towards social responsibility in business. Finally, according to Garriga & Melé in 2004, CSR theories have four main categories: instrumental theories, political theories, integrative theories, and ethical theories. The theories become principles; principles are incorporated into the company's strategy, which guides the decision-making process of managers and executive teams. Hence, it is important to understand different possible viewpoints towards CSR and ESG.

Academic studies showed that better ESG performance usually means better company financial performance; however, the results are quite mixed when analyzing stock returns. Hence, more academic research is needed in the field. However, the results of the analyzed studies seem quite cohesive when it comes to analyzing stock resiliency during periods of financial distress, like COVID-19, where better ESG performance seems to have a positive effect on financial performance and stock price.

It has been observed that scholars whose studies were examined investigated ESG factors' influence on many different companies' pool stock prices rather than financial institutions specifically. However, the ones that performed the analysis of financial institutions found some significant results that ESG performance is affecting Financial institutions' stock performance, in most of the studies, in a positive way, but the results are not cohesive. In some studies, the effect discovered is only short-term, or the stock return could be negatively associated with one or a few of the three factors (environmental, social, governance). Hence, more studies are needed in the field that would use a different pool of banks from various locations. Finally, some studies

showed that the amount of a bank's non-performing loans and ESG performance are negatively related. Hence, this suggests that a lower risk of a bank's failure should have a positive effect on its stock price as well.

In the empirical part of this work, financial institutions from a European sample for which six to eight years of ESG pillar data were present were evaluated by average annual standard deviation during the research period and divided into four quartiles. Then, it was compared to the average pillar score for that quartile to check how volatility and pillar score compare.

Quartile analysis results:

- **Environmental Pillar.** It has been learned that the highest standard deviation was associated with the highest Environmental Pillar average and the second-highest stock return. Moreover, the lowest Environmental pillar is associated with the lowest stock return. Furthermore, the highest stock return is associated with the second Environmental pillar score.
- **Social Pillar.** Moreover, the highest Social Pillar score was associated with both the highest standard deviation and the highest stock return. The last three quartiles for the S score do not seem to be very directly related to the stock returns using this comparison method. The lowest deviation seems to be related to the lowest S pillar average.
- **Governance Pillar.** Finally, the highest G score seems to be related to the lowest stock return, and the lowest G score seems to be related to the highest stock return, which suggests an inverse relationship. The highest standard deviation seems to be associated with the lowest G score. However, as discussed before, the G score seemed to grow less than the other two pillars, and the difference between the highest two quartiles in terms of G score (II and IV) presents a very low difference. Hence, a more complicated model, such as panel data regression, should be developed to investigate this.

Moreover, in the empirical part of this work, fixed-effects panel data regression was constructed for the European sample, while random-effects panel data regression was constructed for the non-European sample based on the results of the Hausman test.

Regression analysis:

- In the European sample, the coefficient for d_Environmental (first difference) is 0.0407, with a p-value of 0.0252. This suggests a significant positive effect on stock return (significant at the 5% level).
- In the European sample, the coefficient for Inflation is -2.085, with a p-value of 0.0042. This suggests a significant negative effect on stock return (significant at the 1% level).
- In the non-European sample, only the Inflation variable proved statistically significant. The coefficient for inflation is -1.4067, and the p-value is 0.0790, which suggests a significant negative relationship with Stock Returns at the 10% level. This indicates that higher inflation may negatively affect the stock returns of financial institutions.

The key points for the recommendations for future research are described below.

Recommendations:

- Based on the results from the empirical analysis, as the E Pillar effect showed to be significant, financial institutions in Europe should analyze the impact of ESG scores further and in more detail. This study suggests that focusing more on ESG practices, especially environmental factors, might help improve financial institutions' stock performance.
- It is important to seek as much balanced panel data as possible for the panel dataset, not to decrease observations used for the model significantly. This would allow the creation of a more reliable model.
- This thesis analyzes the effect of the E, S, and G pillar scores on financial institutions' stock returns separately. However, it would be interesting to analyze ESG combined scores, too, as the weights, at least for Bloomberg scores, are not weighted equally. It would give more insights into how overall ESG performance affects stock returns.
- In quartile analysis, the standard deviation was calculated. However, it would be beneficial to calculate semi-standard deviation as well, which investigates negative

fluctuations only. This would allow to better assess investment risk and evaluate ESG investments as a hedging strategy.

- If the years 2015-2016 of this dataset are eliminated, more observations of financial institutions could be included. A shorter period would also help regarding the unbalanced data issue.
- To split non-European sample into areas like APAC, Americas, LATAM. This would help to create better models based on the region, as ESG regulations often differ by country/region.
- Gretl does not have a built-in command specifically for panel data for Granger causality. The Granger causality test for panel data is more complicated than for time series, and each cross-sectional unit needs to be investigated separately. Therefore, it has not been performed due to a large number of financial institutions. However, this could be investigated in future research as it allows us to evaluate if past time series of the dependent variable could be used in forecasting independent variables and vice versa.

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7. SANTRAUKA

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SANTRAUKA

64 puslapiai, 26 lentelės, 0 paveikslų, 58 šaltiniai
Finansų institucijos yra reikšminga pasaulio ekonomikos dalis, o jų akcijų kainos, kaip ir kitų akcijų, reaguoja į įvairius ekonominius bei neekonominius veiksnius. Šiame darbe pagrindinis dėmesys skiriamas analizei, kiek ESG reitingas gali paveikti Europos finansų institucijų akcijų rezultatus. Aplinkos, socialinės atsakomybės ir valdymo (ESG) rizikos analizės bei ESG poveikio investicijoms svarba ženkliai išaugo nuo tada, kai ESG konceptas pirmą kartą buvo paminėtas Jungtinių Tautų ataskaitoje „Who Cares Wins“ 2004 m.

Literatūros apžvalgoje nagrinėjama ESG koncepto raida, ESG praktikų kritika, įmonių socialinės atsakomybės (CSR) teorijos bei nauji moksliniai darbai, analizuojantys ESG poveikį finansų institucijų akcijų kainoms ir bendrai įmonių finansiniams rezultatams. Nors rezultatai įvairūs, pastebima, kad nemažai mokslinių tyrimų atrado statistiškai reikšmingą teigiamą ryšį tarp įmonių ESG rodiklių ir jų akcijų grąžos ar kitų finansinių rodiklių. Vis dėlto, siekiant išsamiau suprasti šiuos ryšius, būtina detaliau analizuoti atskirus regionus bei industrijas.

Šiame darbe buvo atlikta kvartilių analizė, siekiant įvertinti ryšį tarp Europos finansų institucijų akcijų grąžos, jų kintamumo (standartinio nuokrypio) ir ESG rodiklių balų. Be to, buvo sudaryti panelinės regresijos modeliai, kuriais siekta ištirti ryšį tarp Europos finansų institucijų akcijų grąžos ir jų ESG balų. Regresinėje analizėje rezultatai, gauti iš Europos finansų institucijų imties, buvo lyginami su ne Europos šalių duomenimis, siekiant nustatyti, ar Europos finansų institucijų akcijų kainos yra jautresnės ESG rodiklių balų pokyčiams.

Regresinės analizės rezultatai parodė teigiamą ir reikšmingą ryšį tarp Europos finansų institucijų aplinkosaugos balo ir jų metinės akcijų grąžos. Palyginti su subimtimi (ne Europos šalimis), Europos finansų institucijų akcijų grąža yra jautresnė aplinkos balo pokyčiams – reikšmingi rezultatai buvo pastebėti tik Europos imčiai. Tyrimo duomenys rodo, kad jei Europos finansų institucijos aplinkos ramsčio balas padidėtų vienu punktu, jų akcijų grąža kasmet galėtų išaugti 4,07 proc. Kitų dviejų ESG rodiklių (socialinės atsakomybės ir valdymo) rezultatai nebuvo statistiškai reikšmingi. Be to, pastebėtas reikšmingas neigiamas ryšys tarp finansų institucijų akcijų kainų ir infliacijos.

Regresinės analizės rezultatus sustiprina kvartilių analizės išvados: didžiausias standartinis nuokrypis (pirmoji kvartilė) buvo susijęs su didžiausiu aplinkosaugos balo vidurkiu ir antrąja pagal dydį akcijų grąža. Taip pat nustatyta, kad žemiausias aplinkosaugos balo vidurkis yra susijęs su mažiausia akcijų grąža, o didžiausia akcijų grąža – su antruoju pagal dydį aplinkos balo vidurkiu.

8. ANNEXES

8.1 Annex 1. Min and Max of Environmental, Social, and Governance scores using Excel

Europe. Max of Environmental, Social, and Governance scores

Year	Max of Governance	Max of Social	Max of Environmental
2015	8.331	6.707	6.829
2016	8.200	6.776	6.451
2017	8.278	6.889	6.864
2018	8.634	6.908	7.444
2019	8.580	7.426	6.230
2020	8.593	8.054	7.437
2021	8.848	8.140	7.705
2022	8.605	9.144	9.150

Source: Calculated using Bloomberg data

Non-Europe. Max of Environmental, Social, and Governance scores

Year	Max of Governance	Max of Social	Max of Environmental
2015	8.866	6.169	5.683
2016	8.810	6.698	5.151
2017	8.852	6.734	7.062

2018	8.713	7.812	7.656
2019	8.804	8.143	7.983
2020	8.763	8.652	8.109
2021	8.975	8.725	8.658
2022	9.014	8.759	9.440

Source: Calculated using Bloomberg data

Year	Min of Governance	Min of Social	Min of Environmental
2015	2.262	0.408	0.062
2016	2.510	0.620	0.224
2017	2.633	0.840	0.224
2018	2.732	0.812	0.062
2019	2.671	0.864	0.049
2020	2.927	0.870	0.200
2021	0.401	0.288	0.084
2022	0.504	0.737	0.084

Source: Calculated using Bloomberg data

8.2 Annex 2. Count of Stock Price data

Europe. Count of Financial Institutions for Stock Price Growth

Year	Count of Stock Price Growth
2015	352
2016	373
2017	391
2018	414
2019	431
2020	439
2021	445
2022	453

Source: Calculated using Bloomberg data

Non-Europe. Count of Financial Institutions for Stock Price Growth

Year	Count of Stock Price Growth
2015	1254
2016	1297
2017	1334
2018	1389
2019	1434
2020	1458
2021	1486
2022	1516

Source: Calculated using Bloomberg data

8.3 Annex 3. KPSS – Stationarity testing

Europe. Stock price growth:
Out of 453 units.
Units with interpolated p-values:

- Unit 24: p-value = 0.095

- Unit 27: p-value = 0.084
- Unit 28: p-value = 0.090
- Unit 40: p-value = 0.079
- Unit 68: p-value = 0.086
- Unit 69: p-value = 0.084
- Unit 125: p-value = 0.074
- Unit 126: p-value = 0.086
- Unit 133: p-value = 0.088
- Unit 146: p-value = 0.098
- Unit 154: p-value = 0.084
- Unit 178: p-value = 0.050 (near threshold)

Non-stationary indication:

- Unit 159: p-value < 0.01, rejecting stationarity.

Europe. Inflation:

Out of 453 units.

Interpolated p-values:

- Unit 3: p-value 0.088
- Unit 26: p-value 0.088
- Unit 50: p-value 0.058
- Unit 56: p-value 0.098
- Unit 60: p-value 0.063
- Unit 68: p-value 0.098
- Unit 72: p-value 0.097
- Unit 73: p-value 0.097
- Unit 79: p-value 0.073
- Unit 96: p-value 0.063
- Unit 109: p-value 0.064
- Unit 113: p-value 0.10
- Unit 125: p-value 0.064
- Unit 128: p-value 0.10
- Unit 131: p-value 0.058
- Unit 132: p-value 0.058
- Unit 133: p-value 0.058
- Unit 134: p-value 0.058
- Unit 149: p-value 0.10
- Unit 161: p-value 0.088
- Unit 163: p-value 0.088
- Unit 167: p-value 0.098
- Unit 170: p-value 0.097
- Unit 176: p-value 0.088
- Unit 179: p-value 0.10
- Unit 181: p-value 0.10
- Unit 199: p-value 0.088
- Unit 207: p-value 0.088

Rejected p-values (p-value < 0.01):

- Unit 159: p-value < 0.01

Europe. Environmental pillar (only cross-sectional units with T=8):
KPSS test for Environmental (without trend)
Lag truncation parameter = 0
Unit 1, T = 8
test = 0.590286, interpolated p-value 0.018
Unit 2, T = 8
test = 0.690187, p-value < .01
Unit 3, T = 8
test = 0.737734, p-value < .01
Unit 4, T = 8
test = 0.644752, p-value < .01
Unit 5, T = 8
test = 0.744037, p-value < .01
Unit 6, T = 8
test = 0.654647, p-value < .01
Unit 7, T = 8
test = 0.79324, p-value < .01
Unit 8, T = 8
test = 0.689042, p-value < .01
Unit 9, T = 8
test = 0.615298, interpolated p-value 0.011
Unit 10, T = 8
test = 0.795044, p-value < .01
Unit 11, T = 8
test = 0.530376, interpolated p-value 0.033
Unit 12, T = 8
test = 0.199928, p-value > .10
Unit 13, T = 8
test = 0.708431, p-value < .01
Unit 14, T = 8
test = 0.7032, p-value < .01
Unit 15, T = 8
test = 0.70517, p-value < .01
Unit 16, T = 8
test = 0.7557, p-value < .01
Unit 17, T = 8
test = 0.756719, p-value < .01
Unit 18, T = 8
test = 0.703594, p-value < .01
Unit 19, T = 8
test = 0.570514, interpolated p-value 0.023
Unit 20, T = 8
test = 0.0892541, p-value > .10
Unit 21, T = 8

test = 0.714121, p-value < .01

Europe. Social pillar (only cross-sectional units with T=8):
KPSS test for Social (without trend)
Lag truncation parameter = 0
Unit 1, T = 8
test = 0.539577, interpolated p-value 0.031
Unit 2, T = 8
test = 0.24367, p-value > .10
Unit 3, T = 8
test = 0.316424, p-value > .10
Unit 4, T = 8
test = 0.753723, p-value < .01
Unit 5, T = 8
test = 0.57787, interpolated p-value 0.021
Unit 6, T = 8
test = 0.656538, p-value < .01
Unit 7, T = 8
test = 0.765002, p-value < .01
Unit 8, T = 8
test = 0.594621, interpolated p-value 0.017
Unit 9, T = 8
test = 0.720246, p-value < .01
Unit 10, T = 8
test = 0.124264, p-value > .10
Unit 11, T = 8
test = 0.451643, interpolated p-value 0.057
Unit 12, T = 8
test = 0.670653, p-value < .01
Unit 13, T = 8
test = 0.440028, interpolated p-value 0.063
Unit 14, T = 8
test = 0.705762, p-value < .01
Unit 15, T = 8
test = 0.618189, interpolated p-value 0.010
Unit 16, T = 8
test = 0.690727, p-value < .01
Unit 17, T = 8
test = 0.235242, p-value > .10
Unit 18, T = 8
test = 0.613168, interpolated p-value 0.012
Unit 19, T = 8
test = 0.564663, interpolated p-value 0.024
Unit 20, T = 8
test = 0.780146, p-value < .01
Unit 21, T = 8

test = 0.3222, p-value > .10
Unit 22, T = 8
test = 0.557999, interpolated p-value 0.026
Unit 23, T = 8
test = 0.739936, p-value < .01
Unit 24, T = 8
test = 0.707797, p-value < .01
Unit 25, T = 8
test = 0.343162, p-value > .10

Europe. Governance pillar (only cross-sectional units with T=8):
KPSS test for Governance (without trend)
Lag truncation parameter = 0

Unit 1, T = 8
test = 0.635322, p-value < .01
Unit 2, T = 8
test = 0.223374, p-value > .10
Unit 3, T = 8
test = 0.738417, p-value < .01
Unit 4, T = 8
test = 0.751813, p-value < .01
Unit 5, T = 8
test = 0.525442, interpolated p-value 0.034
Unit 6, T = 8
test = 0.195952, p-value > .10
Unit 7, T = 8
test = 0.69423, p-value < .01
Unit 8, T = 8
test = 0.318491, p-value > .10
Unit 9, T = 8
test = 0.699574, p-value < .01
Unit 10, T = 8
test = 0.779778, p-value < .01
Unit 11, T = 8
test = 0.772497, p-value < .01
Unit 12, T = 8
test = 0.4611, interpolated p-value 0.051
Unit 13, T = 8
test = 0.186354, p-value > .10
Unit 14, T = 8
test = 0.277321, p-value > .10
Unit 15, T = 8
test = 0.681966, p-value < .01
Unit 16, T = 8
test = 0.498381, interpolated p-value 0.041

Unit 17, T = 8
test = 0.194385, p-value > .10
Unit 18, T = 8
test = 0.3352, p-value > .10
Unit 19, T = 8
test = 0.758682, p-value < .01
Unit 20, T = 8
test = 0.742418, p-value < .01
Unit 21, T = 8
test = 0.203634, p-value > .10
Unit 22, T = 8
test = 0.356986, p-value > .10
Unit 23, T = 8
test = 0.385184, interpolated p-value 0.093
Unit 24, T = 8
test = 0.127352, p-value > .10
Unit 25, T = 8
test = 0.550848, interpolated p-value 0.028
Unit 26, T = 8
test = 0.145887, p-value > .10
Unit 27, T = 8
test = 0.0930403, p-value > .10
Unit 28, T = 8
test = 0.598718, interpolated p-value 0.015
Unit 29, T = 8
test = 0.130107, p-value > .10
Unit 30, T = 8
test = 0.371411, p-value > .10
Unit 31, T = 8
test = 0.597018, interpolated p-value 0.016
Unit 32, T = 8
test = 0.770382, p-value < .01
Unit 33, T = 8
test = 0.697168, p-value < .01
Unit 34, T = 8
test = 0.783833, p-value < .01
Unit 35, T = 8
test = 0.217073, p-value > .10
Unit 36, T = 8
test = 0.47109, interpolated p-value 0.048
Unit 37, T = 8
test = 0.434371, interpolated p-value 0.066
Unit 38, T = 8
test = 0.115367, p-value > .10
Unit 39, T = 8

test = 0.144109, p-value > .10
Unit 40, T = 8
test = 0.107837, p-value > .10
Unit 41, T = 8
test = 0.666619, p-value < .01
Unit 42, T = 8
test = 0.271548, p-value > .10
Unit 43, T = 8
test = 0.722449, p-value < .01
Unit 44, T = 8
test = 0.709738, p-value < .01
Unit 45, T = 8
test = 0.7709, p-value < .01
Unit 46, T = 8
test = 0.186122, p-value > .10
Unit 47, T = 8
test = 0.178395, p-value > .10
Unit 48, T = 8
test = 0.653964, p-value < .01
Unit 49, T = 8
test = 0.55013, interpolated p-value 0.028
Unit 50, T = 8
test = 0.576847, interpolated p-value 0.021
Unit 51, T = 8
test = 0.389191, interpolated p-value 0.091
Unit 52, T = 8
test = 0.464687, interpolated p-value 0.050
Unit 53, T = 8
test = 0.18535, p-value > .10
Unit 54, T = 8
test = 0.754188, p-value < .01
Unit 55, T = 8
test = 0.621334, p-value < .01
Unit 56, T = 8
test = 0.107258, p-value > .10
Unit 57, T = 8
test = 0.146099, p-value > .10
Unit 58, T = 8
test = 0.763842, p-value < .01
Unit 59, T = 8
test = 0.111984, p-value > .10
Unit 60, T = 8
test = 0.570833, interpolated p-value 0.023
Unit 61, T = 8
test = 0.725467, p-value < .01
Unit 62, T = 8

test = 0.308881, p-value > .10
Unit 63, T = 8
test = 0.622124, p-value < .01
Unit 64, T = 8
test = 0.112185, p-value > .10
Unit 65, T = 8
test = 0.724955, p-value < .01
Unit 66, T = 8
test = 0.466305, interpolated p-value 0.049
Unit 67, T = 8
test = 0.215562, p-value > .10
Unit 68, T = 8
test = 0.233801, p-value > .10
Unit 69, T = 8
test = 0.608996, interpolated p-value 0.013
Unit 70, T = 8
test = 0.222793, p-value > .10
Unit 71, T = 8
test = 0.365177, p-value > .10
Unit 72, T = 8
test = 0.725687, p-value < .01
Unit 73, T = 8
test = 0.191542, p-value > .10
Unit 74, T = 8
test = 0.116236, p-value > .10
Unit 75, T = 8
test = 0.791617, p-value < .01
Unit 76, T = 8
test = 0.741742, p-value < .01
Unit 77, T = 8
test = 0.125003, p-value > .10
Unit 78, T = 8
test = 0.273646, p-value > .10
Unit 79, T = 8
test = 0.670493, p-value < .01
Unit 80, T = 8
test = 0.188394, p-value > .10
Unit 81, T = 8
test = 0.645048, p-value < .01
Unit 82, T = 8
test = 0.503078, interpolated p-value 0.040
Unit 83, T = 8
test = 0.643561, p-value < .01
Unit 84, T = 8
test = 0.570952, interpolated p-value 0.023
Unit 85, T = 8

test = 0.391028, interpolated p-value 0.090
Unit 86, T = 8
test = 0.0966186, p-value > .10
Unit 87, T = 8
test = 0.623713, p-value < .01
Unit 88, T = 8
test = 0.217252, p-value > .10
Unit 89, T = 8
test = 0.381574, interpolated p-value 0.095
Unit 90, T = 8
test = 0.696232, p-value < .01
Unit 91, T = 8
test = 0.60672, interpolated p-value 0.013
Unit 92, T = 8
test = 0.107245, p-value > .10
Unit 93, T = 8
test = 0.120305, p-value > .10
Unit 94, T = 8
test = 0.188597, p-value > .10
Unit 95, T = 8
test = 0.425194, interpolated p-value 0.071
Unit 96, T = 8
test = 0.614572, interpolated p-value 0.011
Unit 97, T = 8
test = 0.319233, p-value > .10
Unit 98, T = 8
test = 0.131867, p-value > .10
Unit 99, T = 8
test = 0.591513, interpolated p-value 0.017
Unit 100, T = 8
test = 0.234189, p-value > .10
Unit 101, T = 8
test = 0.669009, p-value < .01
Unit 102, T = 8
test = 0.112557, p-value > .10
Unit 103, T = 8
test = 0.77528, p-value < .01
Unit 104, T = 8
test = 0.36403, p-value > .10
Unit 105, T = 8
test = 0.629955, p-value < .01
Unit 106, T = 8
test = 0.365686, p-value > .10

Non-Europe. Environmental pillar (only cross-sectional units with T=8):
KPSS test for Environmental (without trend)

Lag truncation parameter = 0

Unit 1, T = 8
test = 0.468957, interpolated p-value 0.049
Unit 2, T = 8
test = 0.671399, p-value < .01
Unit 3, T = 8
test = 0.279523, p-value > .10
Unit 4, T = 8
test = 0.329096, p-value > .10
Unit 5, T = 8
test = 0.620487, p-value < .01
Unit 6, T = 8
test = 0.579037, interpolated p-value 0.021
Unit 7, T = 8
test = 0.763172, p-value < .01
Unit 8, T = 8
test = 0.769379, p-value < .01
Unit 9, T = 8
test = 0.523852, interpolated p-value 0.035
Unit 10, T = 8
test = 0.746799, p-value < .01
Unit 11, T = 8
test = 0.647728, p-value < .01
Unit 12, T = 8
test = 0.616933, interpolated p-value 0.011
Unit 13, T = 8
test = 0.541645, interpolated p-value 0.030
Unit 14, T = 8
test = 0.692754, p-value < .01
Unit 15, T = 8
test = 0.673649, p-value < .01
Unit 16, T = 8
test = 0.523472, interpolated p-value 0.035
Unit 17, T = 8
test = 0.757263, p-value < .01
Unit 18, T = 8
test = 0.679205, p-value < .01
Unit 19, T = 8
test = 0.582412, interpolated p-value 0.020
Unit 20, T = 8
test = 0.731395, p-value < .01
Unit 21, T = 8
test = 0.608667, interpolated p-value 0.013
Unit 22, T = 8
test = 0.750796, p-value < .01

Unit 23, T = 8
test = 0.760845, p-value < .01

Non-Europe. Social pillar (only cross-sectional units with T=8):

KPSS test for Social (without trend)
Lag truncation parameter = 0

Unit 1, T = 8
test = 0.69199, p-value < .01
Unit 2, T = 8
test = 0.520557, interpolated p-value 0.035
Unit 3, T = 8
test = 0.478346, interpolated p-value 0.046
Unit 4, T = 8
test = 0.684834, p-value < .01
Unit 5, T = 8
test = 0.632789, p-value < .01
Unit 6, T = 8
test = 0.510979, interpolated p-value 0.038
Unit 7, T = 8
test = 0.724997, p-value < .01
Unit 8, T = 8
test = 0.797421, p-value < .01
Unit 9, T = 8
test = 0.39558, interpolated p-value 0.087
Unit 10, T = 8
test = 0.541861, interpolated p-value 0.030
Unit 11, T = 8
test = 0.61314, interpolated p-value 0.012
Unit 12, T = 8
test = 0.630093, p-value < .01
Unit 13, T = 8
test = 0.666277, p-value < .01
Unit 14, T = 8
test = 0.592538, interpolated p-value 0.017
Unit 15, T = 8
test = 0.168694, p-value > .10
Unit 16, T = 8
test = 0.733822, p-value < .01
Unit 17, T = 8
test = 0.559658, interpolated p-value 0.025
Unit 18, T = 8
test = 0.543159, interpolated p-value 0.030
Unit 19, T = 8
test = 0.736209, p-value < .01

Unit 20, T = 8
test = 0.612826, interpolated p-value 0.012
Unit 21, T = 8
test = 0.482571, interpolated p-value 0.045
Unit 22, T = 8
test = 0.392991, interpolated p-value 0.089
Unit 23, T = 8
test = 0.693966, p-value < .01
Unit 24, T = 8
test = 0.28516, p-value > .10
Unit 25, T = 8
test = 0.672761, p-value < .01
Unit 26, T = 8
test = 0.692988, p-value < .01
Unit 27, T = 8
test = 0.718669, p-value < .01
Unit 28, T = 8
test = 0.712567, p-value < .01
Unit 29, T = 8
test = 0.66959, p-value < .01
Unit 30, T = 8
test = 0.664855, p-value < .01
Unit 31, T = 8
test = 0.632017, p-value < .01
Unit 32, T = 8
test = 0.663144, p-value < .01
Unit 33, T = 8
test = 0.704555, p-value < .01
Unit 34, T = 8
test = 0.700459, p-value < .01
Unit 35, T = 8
test = 0.754812, p-value < .01
Unit 36, T = 8
test = 0.205962, p-value > .10
Unit 37, T = 8
test = 0.599142, interpolated p-value 0.015
Unit 38, T = 8
test = 0.760294, p-value < .01
Unit 39, T = 8
test = 0.718109, p-value < .01
Unit 40, T = 8
test = 0.740125, p-value < .01
Unit 41, T = 8
test = 0.359264, p-value > .10
Unit 42, T = 8
test = 0.754909, p-value < .01

Unit 43, T = 8
test = 0.447257, interpolated p-value 0.059
Unit 44, T = 8
test = 0.733682, p-value < .01

Non-Europe. Governance pillar (only cross-sectional units with T=8):

p-value > .10 (stationary)	p-value < .01 (not stationary)	Interpolated p- value	Total
190	111	159	460

Non-Europe. Stock Price (only cross-sectional units with T=8):

p-value > .10 (stationary)	p-value < .01 (not stationary)	Interpolated p-value but stationary	Total
1201	None	53	1254

Non-Europe. Inflation (only cross-sectional units with T=8):

p-value > .10 (stationary)	p-value < .01 (not stationary)	Interpolated p-value but stationary	Total
587	13	654	1254

8.4 Annex 4. Descriptive Statistics using Gretl

Europe Sample
Summary Statistics, using the observations 1:1 - 453:8
(missing values were skipped)

Variable	**Mean**	**Median**	**Minimum**	**Maximum**
StockPriceGrowth	0.071974	-0.0030641	-0.99726	71.095
Environmental	3.0238	2.5074	0.049380	9.1503
Social	3.4752	2.8826	0.28778	9.1441
Governance	5.7951	5.8801	0.40140	8.8478
Inflation	0.021741	0.015230	-0.020985	0.19705
Variable	**Std. Dev.**	**C.V.**	**Skewness**	**Ex. kurtosis**
StockPriceGrowth	1.3607	18.906	44.203	2262.0
Environmental	2.3427	0.77477	0.44431	-1.0529
Social	2.1327	0.61369	0.62304	-0.64766
Governance	1.5992	0.27596	-0.50103	-0.25805
Inflation	0.027613	1.2701	2.2288	6.2049
Variable	**5% Perc.**	**95% Perc.**	**IQ range**	**Missing obs.**
StockPriceGrowth	-0.46237	0.63913	0.38455	326
Environmental	0.26231	6.9470	4.4977	3384
Social	0.83200	7.6291	3.3417	3361

Governance	2.9280	8.0640	2.3202	1929
Inflation	-0.0060254	0.082013	0.019856	326

Non-Europe Sample
Summary Statistics, using the observations 1:1 - 1516:8
(missing values were skipped)

Variable	**Mean**	**Median**	**Minimum**	**Maximum**
Environmental	3.1265	2.6551	0.050262	9.4396
Social	3.8818	3.5040	0.37734	8.7594
Governance	5.6226	5.6457	1.0300	9.0144
StockPriceGrowth	0.056711	-0.0012979	-1.0000	43.177
Inflation	0.10879	0.020758	-0.037530	653.74
Variable	**Std. Dev.**	**C.V.**	**Skewness**	**Ex. kurtosis**
Environmental	2.6035	0.83274	0.50021	-1.0177
Social	2.2079	0.56879	0.41686	-0.88905
Governance	1.5131	0.26912	-0.21481	-0.63354
StockPriceGrowth	0.69409	12.239	32.381	1675.3
Inflation	6.4664	59.440	95.099	9426.8
Variable	**5% Perc.**	**95% Perc.**	**IQ range**	**Missing obs.**
Environmental	0.083856	7.8223	4.4853	11813
Social	0.82579	8.1087	3.5996	11730
Governance	3.0716	7.9190	2.3372	5511
StockPriceGrowth	-0.41918	0.61038	0.37219	960
Inflation	-0.00016369	0.080028	0.032664	960

8.5 Annex 5. Model Europe E&S

Model 1: Fixed-effects, using 192 observations
Included 46 cross-sectional units
Time-series length: minimum 1, maximum 7
Dependent variable: StockPriceGrowth
Robust (HAC) standard errors

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	0.0316744	0.0233850	1.354	0.1823	
d_Environmental	**0.0407027**	**0.0175838**	**2.315**	**0.0252**	**
d_Social	−0.00933508	0.0120935	−0.7719	0.4442	
Inflation	**−2.08499**	**0.690675**	**−3.019**	**0.0042**	***

Mean dependent var −0.003628 S.D. dependent var 0.286320

Sum squared resid	9.938318	S.E. of regression	0.263626
LSDV R-squared	0.365288	Within R-squared	0.071911
Log-likelihood	11.82917	Akaike criterion	74.34167
Schwarz criterion	233.9589	Hannan-Quinn	138.9878
rho	−0.478293	Durbin-Watson	2.587518

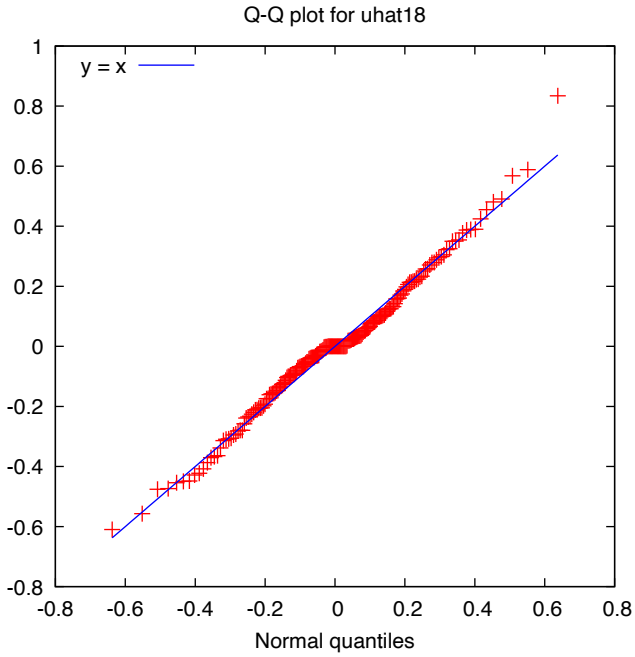
Joint test on named regressors -
Test statistic: F(3, 45) = 8.0926
with p-value = P(F(3, 45) > 8.0926) = 0.000203298

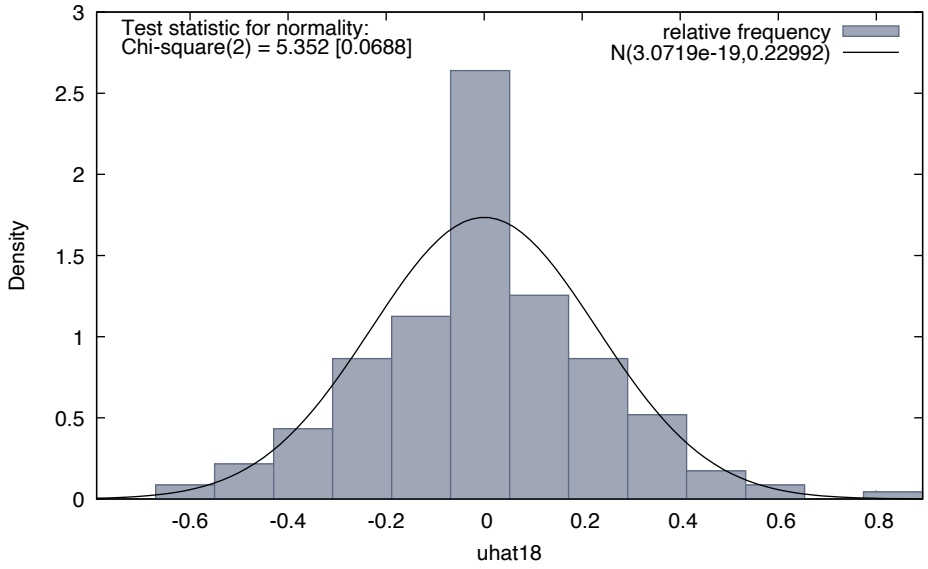
Robust test for differing group intercepts -
Null hypothesis: The groups have a common intercept
Test statistic: Welch F(45, 108.8) = 0.737767
with p-value = P(F(45, 108.8) > 0.737767) = 0.874455

Distribution free Wald test for heteroskedasticity:
Chi-square(28) = 1.3529e+34, with p-value = 0

Normality of residual:

```
Frequency distribution for uhat18, obs 2-424
number of bins = 13, mean = 3.07191e-19, sd = 0.22992

       interval          midpt   frequency    rel.     cum.

          < -0.54996  -0.61014         2      1.04%    1.04%
  -0.54996 - -0.42959  -0.48977         5      2.60%    3.65%
  -0.42959 - -0.30922  -0.36941        10      5.21%    8.85% *
  -0.30922 - -0.18886  -0.24904        20     10.42%   19.27% ***
  -0.18886 - -0.068491 -0.12867        26     13.54%   32.81% ****
 -0.068491 -  0.051875 -0.0083082      61     31.77%   64.58% ***********
  0.051875 -  0.17224   0.11206        29     15.10%   79.69% *****
   0.17224 -  0.29261   0.23243        20     10.42%   90.10% ***
   0.29261 -  0.41298   0.35279        12      6.25%   96.35% **
   0.41298 -  0.53334   0.47316         4      2.08%   98.44%
   0.53334 -  0.65371   0.59353         2      1.04%   99.48%
   0.65371 -  0.77408   0.71389         0      0.00%   99.48%
          >=  0.77408   0.83426         1      0.52%  100.00%

Missing observations = 231 (54.61%)

Test for null hypothesis of normal distribution:
Chi-square(2) = 5.352 with p-value 0.06882
```





8.6 Annex 6. Model Europe G

Model 2: Fixed-effects, using 1243 observations
Included 354 cross-sectional units
Time-series length: minimum 1, maximum 7
Dependent variable: StockPriceGrowth
Robust (HAC) standard errors

	coefficient	std. error	t-ratio	p-value	
const	0.0260951	0.0124832	2.090	0.0373	**

```
  Inflation      −1.23984      0.414928     −2.988    0.0030  ***
  d_Governance    0.00965149   0.0279665     0.3451   0.7302

Mean dependent var  −0.010133   S.D. dependent var   0.345528
Sum squared resid    108.8733   S.E. of regression   0.350347
LSDV R-squared       0.265768   Within R-squared     0.007572
Log-likelihood      −250.3268   Akaike criterion     1212.654
Schwarz criterion    3037.254   Hannan-Quinn         1898.772
rho                 −0.469837   Durbin-Watson        2.541578

Joint test on named regressors -
  Test statistic: F(2, 353) = 4.47261
  with p-value = P(F(2, 353) > 4.47261) = 0.0120718

Robust test for differing group intercepts -
  Null hypothesis: The groups have a common intercept
  Test statistic: Welch F(353, 1224.2) = 0.606907
  with p-value = P(F(353, 1224.2) > 0.606907) = 1

Test for normality of residual -
  Null hypothesis: error is normally distributed
  Test statistic: Chi-square(2) = 381.136
  with p-value = 1.72763e-83

Wooldridge test for autocorrelation in panel data -
  Null hypothesis: No first-order autocorrelation (rho = -0.5)
  Test statistic: F(1, 162) = 68.5163
  with p-value = P(F(1, 162) > 68.5163) = 4.42375e-14
```

8.7 Annex 7. Model Non-Europe E&S

```
Model 1: Random-effects (GLS), using 249 observations
Included 58 cross-sectional units
Time-series length: minimum 1, maximum 7
Dependent variable: StockPriceGrowth
Robust (HAC) standard errors

                  coefficient   std. error      z      p-value
  ------------------------------------------------------------
  const            0.104859     0.0302401     3.468    0.0005  ***
  Inflation       −1.40665      0.800934     −1.756    0.0790  *
  d_Environmental −0.00185083   0.0175291    −0.1056   0.9159
  d_Social        −0.0127962    0.0115753    −1.105    0.2690

Mean dependent var   0.052066   S.D. dependent var   0.286990
Sum squared resid    20.03648   S.E. of regression   0.285393
```

Log-likelihood −39.58836 Akaike criterion 87.17671
Schwarz criterion 101.2465 Hannan-Quinn 92.84004
rho −0.262224 Durbin-Watson 2.093689

'Between' variance = 0
'Within' variance = 0.0825057
mean theta = 0
corr(y,yhat)^2 = 0.019074

Joint test on named regressors -
Asymptotic test statistic: Chi-square(3) = 5.71886
with p-value = 0.126119

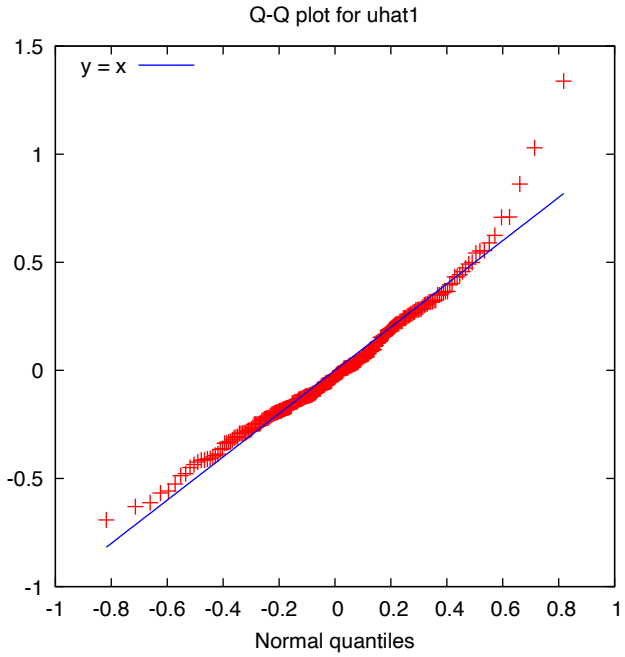
Breusch-Pagan test -
Null hypothesis: Variance of the unit-specific error = 0
Asymptotic test statistic: Chi-square(1) = 0.123788
with p-value = 0.724962

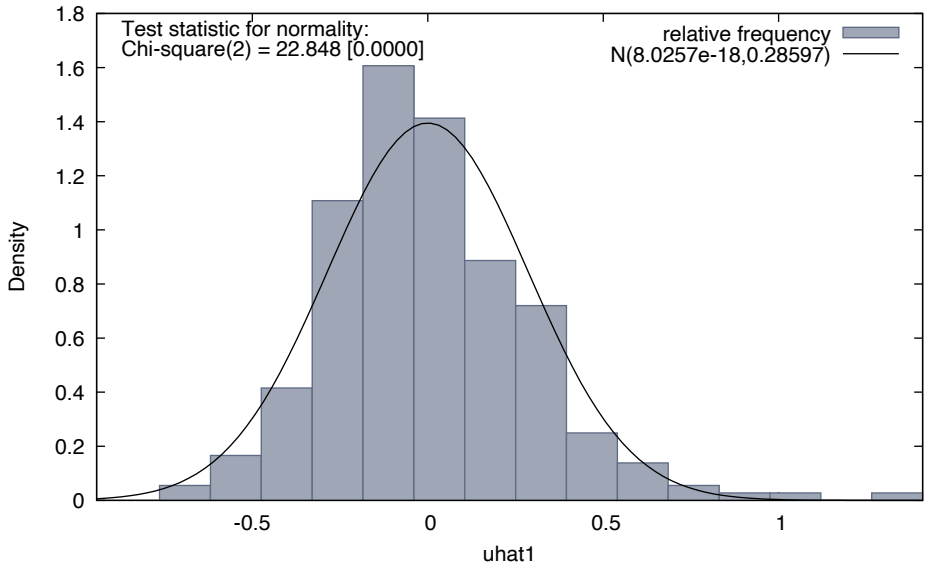
Hausman test -
Null hypothesis: GLS estimates are consistent
Asymptotic test statistic: Chi-square(3) = 3.83121
with p-value = 0.280276

Test for normality of residual -
Null hypothesis: error is normally distributed
Test statistic: Chi-square(2) = 22.8476
with p-value = 1.09321e-05

Wooldridge test for autocorrelation in panel data -
Null hypothesis: No first-order autocorrelation (rho = -0.5)
Test statistic: F(1, 37) = 3.5762
with p-value = P(F(1, 37) > 3.5762) = 0.0664624

Normality of residual:



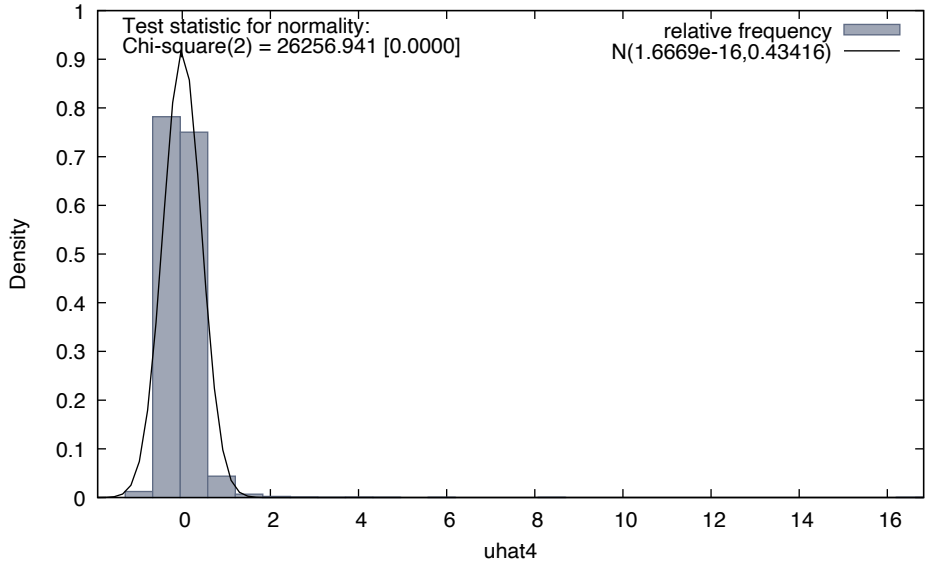


8.8 Annex 8. Model Non-Europe G

Model 4: Random-effects (GLS), using 5115 observations
Included 1340 cross-sectional units
Time-series length: minimum 1, maximum 7
Dependent variable: StockPriceGrowth
Robust (HAC) standard errors

	coefficient	std. error	z	p-value

```
  ------------------------------------------------------------
  const          0.0455421    0.00809417    5.627    1.84e-08 ***
  Inflation     −0.0404214    0.171722     −0.2354   0.8139
  d_Governance   0.0331603    0.0320657     1.034    0.3011

Mean dependent var   0.046404   S.D. dependent var   0.434264
Sum squared resid    963.5971   S.E. of regression   0.434120
Log-likelihood      −2988.740   Akaike criterion     5983.479
Schwarz criterion    6003.099   Hannan-Quinn         5990.348
rho                 −0.254226   Durbin-Watson        2.055553

'Between' variance = 0
'Within' variance = 0.173064
mean theta = 0
corr(y,yhat)^2 = 0.000857433

Joint test on named regressors -
  Asymptotic test statistic: Chi-square(2) = 1.09425
  with p-value = 0.578611

Breusch-Pagan test -
  Null hypothesis: Variance of the unit-specific error = 0
  Asymptotic test statistic: Chi-square(1) = 42.012
  with p-value = 9.07142e-11

Hausman test -
  Null hypothesis: GLS estimates are consistent
  Asymptotic test statistic: Chi-square(2) = 4.14658
  with p-value = 0.125771
```



8.9 Annex 9. Quartile Analysis - Europe

Environmental Score

No	Company	StdDev of measure period	E count	E average	Average of E averages	Average stock yearly growth	Average of stock averages
1	UCG IM Equity	39.74%	8	2.54		-3%	
2	LSEG LN Equity	38.98%	8	6.60		17%	
3	AMUN FP Equity	38.29%	7	3.79		9%	
4	PGHN SW Equity	33.13%	8	1.41		20%	
5	CSGN SW Equity	32.28%	8	2.14		-16%	
6	VANQ LN Equity	31.75%	8	5.16	3.61	-21%	1.06%
7	DBK GR Equity	30.54%	8	2.66		-5%	
8	INGA NA Equity	28.85%	8	3.41		3%	
9	ABDN LN Equity	28.73%	6	2.43		-11%	
10	III LN Equity	25.19%	8	0.78		14%	
11	SAN SM Equity	22.60%	8	1.98		-9%	
12	ISP IM Equity	22.47%	8	1.41	2.11	-1%	-1.73%
13	BBVA SM Equity	21.45%	8	2.72		-3%	
14	PHNX LN Equity	21.15%	8	1.42		-2%	
15	PRU LN Equity	20.51%	7	1.34		-3%	
16	UBSG SW Equity	20.05%	8	2.96		3%	
17	HNR1 GR Equity	18.89%	8	1.92		12%	
18	AGN NA Equity	18.54%	8	2.83	2.20	-3%	0.56%
19	DB1 GR Equity	18.32%	8	5.46		13%	
20	DNB NO Equity	17.30%	8	2.70		5%	
21	ZURN SW Equity	15.41%	8	2.66		6%	
22	US IM Equity	14.42%	8	1.47		0%	
23	MUV2 GR Equity	13.26%	8	2.50		7%	

24	SREN SW Equity	12.57%	8	4.15	3.16	2%	5.43%

Social Score

No	Company	StdDev of measure period	S count	S average	Average of S average	Average stock yearly growth	Average of stock averages
1	INVP LN Equity	47.54%	8	6.25		7%	
2	UCG IM Equity	39.74%	8	3.95		-3%	
3	LSEG LN Equity	38.98%	8	4.69		17%	
4	AMUN FP Equity	38.29%	7	2.24		9%	
5	FBK IM Equity	35.78%	8	4.18		19%	
6	PGHN SW Equity	33.13%	8	5.38		20%	
7	CSGN SW Equity	32.28%	8	2.69	4.20	-16%	7.64%
8	VANQ LN Equity	31.75%	8	2.90		-21%	
9	SAGA LN Equity	31.51%	8	1.30		-26%	
10	DBK GR Equity	30.54%	8	2.69		-5%	
11	INGA NA Equity	28.85%	8	2.44		3%	
12	ABDN LN Equity	28.73%	6	5.01		-11%	
13	III LN Equity	25.19%	8	4.02		14%	
14	SAN SM Equity	22.60%	8	4.42	3.25	-9%	-8.02%
15	ISP IM Equity	22.47%	8	3.90		-1%	
16	BBVA SM Equity	21.45%	8	3.85		-3%	
17	PHNX LN Equity	21.15%	8	2.37		-2%	
18	PRU LN Equity	20.51%	8	2.17		-3%	
19	UBSG SW Equity	20.05%	8	2.96		3%	
20	HNR1 GR Equity	18.89%	8	6.90	3.80	12%	0.93%
21	AGN NA Equity	18.54%	8	2.40		-3%	
22	DB1 GR Equity	18.32%	8	3.28		13%	
23	DNB NO Equity	17.30%	8	3.97		5%	
24	ZURN SW Equity	15.41%	8	1.48		6%	
25	US IM Equity	14.42%	8	3.51		0%	
26	MUV2 GR Equity	13.26%	8	4.92		7%	
27	SREN SW Equity	12.57%	8	2.51	3.15	2%	4.17%

Governance Score

No	Company	StdDev of measure period	Average of St Dev for quartile	G average	Average of G averages	Average stock yearly growth	Average of Stock averages	No of observations
1	**TPEIR GA Equity**	112.50%		5.033674429		-13.76%		7
2	**TCS LI Equity**	106.35%		4.194198875		56.75%		8
3	**ALR PW Equity**	85.39%		4.649557875		9.55%		8
4	**ETE GA Equity**	81.83%		5.054295857		5.34%		7
5	**MIL PW Equity**	70.96%		4.464394125		6.35%		8
6	**PLUS LN Equity**	65.75%		5.32236975		23.88%		8
7	**MBK PW Equity**	60.42%		4.913945286		3.87%		7
8	**EUROB GA Equity**	56.10%		5.045638625		-4.15%		8
9	**GLJ GR Equity**	53.74%		4.526814429		4.53%		7
10	**AZM IM Equity**	51.64%		4.984016375		9.79%		8
11	**KINVB SS Equity**	51.40%		6.05562375		10.08%		8
12	**EMG LN Equity**	47.96%		7.009235375		9.11%		8
13	**INVP LN Equity**	47.54%		6.336011		7.18%		8
14	**ALPHA GA Equity**	47.54%		5.18258675		-16.58%		8
15	**PBB GR Equity**	46.21%		5.364037		1.88%		7
16	**RBI AV Equity**	45.65%		5.303329625		8.55%		8
17	**CBK GR Equity**	45.56%		6.117771286		4.02%		7
18	**MTRO LN Equity**	44.26%		7.264838667		-26.35%		6
19	**SAB SM Equity**	43.80%		5.796581375		-1.46%		8
20	**PKO PW Equity**	43.03%		5.762856571		1.81%		7
21	**AIBG ID Equity**	42.06%		7.751771714		-11.07%		7
22	**JUP LN Equity**	41.83%		7.66661725		-6.19%		8
23	**SPL PW Equity**	40.97%		4.736285143		-0.67%		7
24	**PEO PW Equity**	40.64%		4.845584625		-5.20%		8
25	**BCP PL Equity**	40.34%		5.062602625		-12.41%		8
26	**IPF LN Equity**	39.78%		7.706709		-15.55%		8
27	**UCG IM Equity**	39.74%		6.479607625		-2.87%		8
28	**AKER NO Equity**	39.02%		3.756034571		21.05%		7
29	**LSEG LN Equity**	38.98%		7.965567625		16.98%		8
30	**EFGN SW Equity**	38.73%		6.762420625		3.98%		8
31	**AMUN FP Equity**	38.29%		5.733431857		9.02%		7

32	**ARW LN Equity**	38.24%		7.711356833		9.33%		6
33	**PTSB ID Equity**	36.96%		7.030706		-9.99%		8
34	**BIRG ID Equity**	36.67%		7.17023925		3.17%		8
35	**COFA FP Equity**	36.66%		6.03968675		4.98%		8
36	**BAMI IM Equity**	36.61%		5.833979375		-0.99%		8
37	**ABN NA Equity**	36.51%		6.682666143		-1.05%		7
38	**HL/ LN Equity**	36.12%	50.15%	8.051320571	5.930746437	0.28%	2.72%	7
39	**FBK IM Equity**	35.78%		6.88069275		19.07%		8
40	**ING PW Equity**	34.80%		4.880578125		4.57%		8
41	**GLE FP Equity**	34.45%		6.573630375		-1.27%		8
42	**CRG IM Equity**	34.26%		5.100331		-39.23%		6
43	**IGG LN Equity**	34.11%		7.68957975		3.14%		8
44	**TCAP LN Equity**	33.91%		7.082399		-1.99%		8
45	**ENX FP Equity**	33.80%		5.809496571		16.67%		7
46	**BGN IM Equity**	33.79%		5.909050125		7.42%		8
47	**ASHM LN Equity**	33.71%		7.252967		-0.68%		8
48	**EBS AV Equity**	33.41%		5.87399725		8.52%		8
49	**BHW PW Equity**	33.24%		4.173110875		-2.09%		8
50	**SOF BB Equity**	33.16%		4.536629857		15.59%		7
51	**PGHN SW Equity**	33.13%		7.084147		20.20%		8
52	**MRO LN Equity**	32.96%		6.78091275		-10.72%		8
53	**VMUK LN Equity**	32.62%		7.335719833		-2.13%		6
54	**BMPS IM Equity**	32.29%		5.687679286		-50.29%		7
55	**CSGN SW Equity**	32.28%		7.15931925		-16.08%		8
56	**OTP HB Equity**	32.23%		4.690435429		12.94%		7
57	**BMED IM Equity**	32.17%		5.515916714		7.23%		7
58	**VANQ LN Equity**	31.75%		7.411771375		-20.92%		8
59	**SAGA LN Equity**	31.51%		7.403502875		-25.93%		8
60	**STJ LN Equity**	31.46%		7.621268125		5.04%		8
61	**DBK GR Equity**	30.54%		5.678840625		-5.29%		8
62	**OSB LN Equity**	30.16%		7.976214375		10.78%		8
63	**RF FP Equity**	30.06%		5.150363571		4.86%		7
64	**NWG LN Equity**	29.59%		7.792510143		-4.75%		7
65	**ASRNL NA Equity**	29.49%		5.801529833		14.78%		6

66	**CABK SM Equity**	28.93%		5.861945429		-0.19%		7
67	**INGA NA Equity**	28.85%		6.536527625		2.82%		8
68	**ABDN LN Equity**	28.73%		7.9761465		-11.41%		6
69	**CNP FP Equity**	28.65%		4.879429		6.03%		7
70	**BEZ LN Equity**	28.55%		7.844627		11.34%		7
71	**TOP DC Equity**	28.34%		5.882208571		8.85%		7
72	**KN FP Equity**	28.26%		5.835544286		-0.61%		7
73	**BAER SW Equity**	28.14%		7.11514925		6.57%		8
74	**SDR LN Equity**	27.63%		6.893368375		-0.21%		8
75	**HSX LN Equity**	27.61%		7.651923286		3.36%		7
76	**MING NO Equity**	27.56%	31.37%	6.679482143	6.421288035	9.62%	0.15%	7
77	**INTRUM SS Equity**	27.52%		6.05889475		-6.51%		8
78	**STAN LN Equity**	27.48%		7.240709857		-4.04%		7
79	**LLOY LN Equity**	27.16%		7.55635725		-5.71%		8
80	**BPE IM Equity**	26.06%		6.021620429		-5.89%		7
81	**VIG AV Equity**	25.90%		6.353468125		-4.61%		8
82	**ACA FP Equity**	25.84%		6.2415995		0.35%		8
83	**PZU PW Equity**	25.51%		4.05048725		-3.84%		8
84	**MB IM Equity**	25.49%		5.473327875		4.70%		8
85	**ARLN GR Equity**	25.36%		6.360592125		1.31%		8
86	**LUNDB SS Equity**	25.34%		3.705902125		11.39%		8
87	**III LN Equity**	25.19%		7.897329125		13.58%		8
88	**SVEG NO Equity**	25.05%		4.866678875		9.44%		8
89	**BNP FP Equity**	25.03%		6.60515375		2.39%		8
90	**STB NO Equity**	25.01%		6.768142125		12.80%		8
91	**CMBN SW Equity**	24.89%		8.05963225		8.22%		8
92	**UNI IM Equity**	24.87%		5.399741375		2.26%		8
93	**PAG LN Equity**	24.79%		7.754537125		3.10%		8
94	**JUST LN Equity**	23.95%		7.042190714		-6.90%		7
95	**DANSKE DC Equity**	23.79%		7.14477375		-0.82%		8
96	**INVEB SS Equity**	23.37%		4.786670375		11.17%		8
97	**MONET CP Equity**	23.33%		4.101490667		2.91%		6
98	**KOMB CP Equity**	22.86%		4.567570143		-2.18%		7
99	**MF FP Equity**	22.77%		6.356041125		-0.10%		8

100	**NDA FH Equity**	22.76%		6.279079875		1.01%		8
101	**SAN SM Equity**	22.60%		6.70869675		-9.00%		8
102	**ISP IM Equity**	22.47%		5.88076375		-1.12%		8
103	**LGEN LN Equity**	22.43%		8.270017286		-0.93%		7
104	**JYSK DC Equity**	22.31%		5.016153		5.42%		8
105	**KBC BB Equity**	22.26%		5.663239429		3.84%		7
106	**BKT SM Equity**	22.16%		5.357821571		3.59%		7
107	**TLX GR Equity**	22.11%		4.794366375		7.56%		8
108	**ADM LN Equity**	22.01%		8.207107625		5.31%		8
109	**INDUA SS Equity**	22.01%		4.857279875		5.59%		8
110	**AV/ LN Equity**	21.82%		8.20133525		-5.25%		8
111	**UQA AV Equity**	21.73%		6.315213		-0.94%		8
112	**VONN SW Equity**	21.50%		7.478271429		9.27%		7
113	**BBVA SM Equity**	21.45%		6.591647875		-3.31%		8
114	**REIN LX Equity**	21.32%	23.88%	3.34003075	6.14141933	0.51%	1.70%	8
115	**BARC LN Equity**	21.25%		7.827118125		-6.20%		8
116	**PHNX LN Equity**	21.15%		7.912620625		-1.77%		8
117	**CS FP Equity**	21.15%		6.774741125		4.27%		8
118	**BKIA SM Equity**	20.64%		6.276779667		-10.21%		6
119	**PRU LN Equity**	20.51%		7.262689875		-2.75%		8
120	**HSBA LN Equity**	20.36%		7.50513925		-3.17%		8
121	**AGS BB Equity**	20.33%		5.561876875		4.41%		8
122	**UBSG SW Equity**	20.05%		7.11566725		2.89%		8
123	**BCVN SW Equity**	19.51%		6.280321125		9.09%		8
124	**GBLB BB Equity**	19.25%		4.09998375		0.80%		8
125	**G IM Equity**	18.92%		5.821330857		-0.34%		7
126	**HNR1 GR Equity**	18.89%		5.032453625		11.64%		8
127	**DLG LN Equity**	18.69%		7.918852375		-5.77%		8
128	**AGN NA Equity**	18.54%		6.41709475		-3.33%		8
129	**NN NA Equity**	18.47%		7.107484875		5.40%		8
130	**SEBA SS Equity**	18.44%		5.064365375		0.05%		8
131	**DB1 GR Equity**	18.32%		6.9364765		12.82%		8
132	**GJF NO Equity**	18.24%		6.602093714		3.63%		7
133	**LRE LN Equity**	18.08%		7.891112375		0.15%		8

134	**SCR FP Equity**	17.95%		5.860147		-1.99%		8
135	**ALV GR Equity**	17.81%		5.976526		4.44%		8
136	**DNB NO Equity**	17.30%		6.342366125		4.94%		8
137	**SLHN SW Equity**	17.19%		6.51467425		11.34%		8
138	**LBK SM Equity**	17.03%		4.853748333		-14.49%		6
139	**MAP SM Equity**	16.93%		5.357325625		-5.45%		8
140	**GCO SM Equity**	16.91%		4.692010625		2.21%		8
141	**SWEDA SS Equity**	16.90%		7.121908		-3.44%		8
142	**TRYG DC Equity**	16.36%		6.090798875		4.94%		8
143	**BALN SW Equity**	15.60%		7.897161625		3.23%		8
144	**RSA LN Equity**	15.52%		5.847395667		5.66%		6
145	**ZURN SW Equity**	15.41%		7.68308875		6.33%		8
146	**CBG LN Equity**	15.25%		7.872162125		-6.18%		8
147	**HELN SW Equity**	14.82%		7.127069875		3.53%		8
148	**HAL NA Equity**	14.70%		2.71632725		0.36%		8
149	**US IM Equity**	14.42%		5.5927305		-0.35%		8
150	**SAMPO FH Equity**	14.31%		5.812881125		2.38%		8
151	**MUV2 GR Equity**	13.26%		6.7170935		6.84%		8
152	**SREN SW Equity**	12.57%		7.315844		1.96%		8
153	**SHBA SS Equity**	10.18%	17.47%	5.197461625	6.358895461	-4.45%	1.11%	8