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ESG SCORES AND THE FINANCIAL PERFORMANCE OF EUROPEAN BANKS IN 2012-2021

Bachelor's thesis

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ABSTRACT

Recent years have brought new changes to companies worldwide with more consideration and implementation towards sustainable practices. These practices are measured by the ESG metric, which represents a firm's overall contribution to sustainability. ESG is an acronym formed from Environmental, Social and Governance scores, also known as pillar scores. Since financial institutions drive the economy forward, it is vital to know if sustainable practices benefit them in financial performance.

This thesis aims to determine how ESG scores and performance are related within European banks from 2012 to 2021. Furthermore, evaluating the relationship between ESG and financial performance using the pillar score variables to gain a more comprehensive view of the topic.

For this study, quantitative methods were applied. A panel data model was made with separate regressions for each of the sustainability variables with performance metrics of Tobin's Q and Return on Average Assets as dependent variables. Moreover, separate regression models were made to study the combined effect of the pillar scores with the dependent variables.

The study results demonstrated significant positive relationships between ESG scores and Return on Average Assets. Notably, the social and governance pillar scores had significant positive relationships with ROAA. However, from all of the pillar scores only governance had a significant relationship with Tobin's Q. Results indicate that social and governance improvements may benefit European banks when prioritising financial performance.

Keywords: ESG Score, Pillar Scores, Panel Data, Ethical banking

INTRODUCTION

In response to climate change, actions towards sustainability are being taken by firms, governments, and individuals. Sustainable alternatives are now offered for customers to adapt and change their buying behaviour to combat climate change. Production methods and logistics chains are revamped to reduce emissions. Governments and global organizations are taking action to regulate emissions, promote green actions, and keep the 1.5-degree climate target set in the Paris agreement in mind. The finance world is also contributing by offering to fund green initiatives. Whilst sustainable behaviour is becoming more desirable, distinguishing which activities are genuinely environmentally sustainable is becoming more difficult for consumers. A rating system was created to help investors and consumers to identify and evaluate companies with virtuous sustainable objectives from dishonest ones.

ESG as a rating system has a variety of definitions; however, the European Commission defined it recently in a report: “There is no single definition of ESG ratings although it can be said that ESG ratings generally assess the impact of E, S and G factors on a company and/or a company’s impact on the outside world.” (European Commission, 2022, pp. 1). The characters in the acronym of ESG are defined as environmental, social and governance, and they are evaluated separately to determine the whole ESG score. The environmental score is measured by a company’s overall emissions, resource efficiency and the climate risk they exhibit to society. The social score is determined from the overall working conditions for employees, contributions towards surrounding society and addressing diversity issues. Lastly, the governance score is assessed from stakeholder engagement and the governance structure within the company. The company or independent rating agencies then post ESG ratings or scores. The most notable rating agencies include MSCI ESG Research, Thompson Reuters ESG Research data and Bloomberg ESG Data Services. Such rating agencies create ESG scores based on available information that the company has issued, media sources, and government databases.

ESG as a rating system was not the beginning of corporate sustainability; however, with increased attention from consumers towards environmental awareness, a literal grade has eased decision-

making processes for consumers and companies. Before using ESG, companies and institutions practised socially responsible behaviour in the form of CSR or corporate social responsibility to adapt to government regulations to, for example, reduce air pollution caused by factories or combat racial issues in the workplace. Howard Bowen has often been called the father of CSR as he started the discussion on the topic in his book "Social responsibilities of a businessman". Bowen, when discussing social responsibilities, defined CSR as: "It refers to the obligations of businessmen to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society." (Bowen, 2013). The idea of CSR was not meant to be a quantitative metric for companies like ESG but a qualitative one. Both ESG and CSR have been used in studies as a metric to determine how sustainable practices affect company performance. In this thesis, both metrics will appear in the presented studies as the theoretical frameworks are similar.

Financial institutions are economic drivers, and whilst their emission levels are lower than other industries, evaluating their sustainable values' impact on the economy is crucial. Environmental objectives are becoming essential for all industries, and the effects that ESG has on a bank's performance are essential to study, as banks have a crucial role as a financier in almost every industry. Furthermore, suppose sustainable values do impact financial performance. In that case, banks can create a chain reaction to bolster better values for companies by implementing regulations, caveats and benefits to their lending practices and overall operations.

This thesis aims to determine how ESG scores and performance are related within European banks from 2012 to 2021. Evaluating pillar scores separately can help understand the overall relationship between ESG and financial performance.

Are ESG Scores related to a bank's financial performance?

Hypotheses are needed to help answer the research question. This thesis will use eight hypotheses representing pillar scores and the overall ESG score and their relationship to two financial performance measures. Hypotheses are formed in the theoretical framework chapter and are based on previous studies and theories on the topic. The hypothesis will be used to evaluate the outcome of the panel data.

For this research, panel data is used to investigate how ESG metrics affect financial performance. The data was collected from Thompson Reuters Eikon data stream filtering by financial institutions which offer banking services in Europe. Financial ratios were provided by Moody's Analytics BankFocus. The time series is limited to 2012 to 2021 due to the lack of available ESG scores from the Eikon database. Furthermore, available banks with ESG scores and financial data summed up to 72 banks.

This paper consists of four chapters. The first chapter provides insight into ethical banking and assesses the theoretical frameworks for this study by reviewing stakeholder theory, legitimacy theory, and shared value theory and summarizing previous research. In the second chapter, the chosen banks, study period and appropriate metrics and ratios are described, and a summary of the data is provided. Finally, the findings are presented in the third chapter, followed by a discussion of the results, before concluding the thesis in the final chapter.

1. THEORETICAL FRAMEWORK

This chapter examines ethical banking and theories linked to sustainability scores and performance, after which previous research will be discussed and lastly development and presentation of hypotheses.

1.1. Ethical banking

Sustainable banking, ethical banking, and green banking are terms related to banks that are used interchangeably as they usually represent the same ideas. For example, a book on sustainable banking by Bouma et al. (2001) defined it as a dynamic term that changes over time; however, some ideas are still present in most sustainable banks. These central ideas impact a bank's structure, like new policies or transparency and communication requirements. Environmental acts also contribute to a bank's sustainability as green investment funds and environmental risks that banks bear also help the notion of a sustainable image of banks. As a result, financial investment decisions are closely monitored, and sectors with harmful environmental practices (e.g., tobacco and firearms) are avoided.

The first ethical banks were founded in the 1970s, around the same time corporate social responsibility was introduced into companies. In 1987 the World Health Organization posted air quality guidelines for Europe, and The Single European Act was created, which included aims for the preservation of the environment. United Nations Environmental Program Financial Initiative was founded in 1992 and promoted environmental considerations for financial institutions. After these novel changes and guidelines, banks started contributing more to sustainability and green finance. ESG as a metric was introduced in 2004 in an initiative called "Who Cares Wins" by the United Nations, which sparked further changes for all financial institutions and firms.

Banks with green investment products offered to customers and practice sustainable finance are considered ethical banks. The European Commission defines sustainable finance as: "Sustainable finance refers to the process of taking environmental, social and governance (ESG) considerations

into account when making investment decisions in the financial sector, leading to more long-term investments in sustainable economic activities and projects." (European Commission Website, 2022). Investments are not the only source to commit towards sustainable finance; products and services banks offer also impact sustainability. Green loans for houses and electric cars are now offered for households and individuals to help customers reduce their overall emissions. Innovations towards sustainability also occur in the banks' portfolios through credit cards made from recycled materials and donation opportunities incorporated into them. Changes to waste and water management in offices also contributes towards better ESG scores, and renewable products are being adapted to the value chain.

For banks operating in the EU, changes towards sustainability are still going strong. In 2020 the European Commission outlined its 2030 objectives of cutting greenhouse gasses by 55%. Objectives towards sustainability will foster new changes in governance structures and practices to make owners and managers act consciously in their strategies. Efforts towards sustainability will only increase along with new regulations as the 2050 target of no net emissions of greenhouse gases is still a goal which needs substantial effort from everyone. To combat new regulations, banks can pre-emptively prepare by changing their practice into a more sustainable one, thus evading fines from governance bodies.

1.2. Theoretical foundation

This chapter examines the theoretical foundation of how financial performance can be improved with actions towards better sustainability and the benefits associated with good ESG scores. This chapter analyses the stakeholder theory, shared value theory and legitimacy theory.

1.2.1. Stakeholder theory

From a theoretical point of view, Freeman's stakeholder theory (1984) often explains the relationship between ESG and financial performance, which outlines the importance of creating value for stakeholders (e.g., customers, suppliers, and employees). Moreover, the value created for stakeholders is reflected in the ability of the company to generate more revenue from loyal customers and employees who enjoy contributing toward the company's success. Furthermore, Barnett and Salomon (2006) found positive evidence for the relationship between stakeholder

theory and financial performance when evaluating socially responsible funds and their screening processes.

Donaldson and Lee (1995) later argued that Stakeholder theory has three distinct ways in which it could be applied to an organisation:

1. The descriptive use of stakeholder theory explains why actions have or will be taken within an organisation and then proposes explanations or predictions to reach specific goals.
2. The instrumental use of stakeholder theory offers ways to reach specific aims or goals with stakeholder approaches.
3. The normative stakeholder approach offers ways to guide firms to choose the most ethical option.

This thesis will use the instrumental stakeholder approach as a theoretical standpoint.

A contrary opinion to the stakeholder theory is the shareholder theory stated by Friedman (1970), which states that the sole purpose of a company is to maximise value for its shareholders, and corporate social responsibility is in the hands of the consumers. This view states that responsibility efforts only decrease the potential profits a company can earn for its shareholders.

From the viewpoint of stakeholder theory, a cross-country study focusing on the ethical identity of a corporation and its relationship to performance, Berrone et al. (2007) found higher economic benefits and sustainable competitive advantage when companies satisfied the demands of all stakeholders. With a more limited scope focusing on stakeholder management, a study by Berman et al. (1999) found that enhanced employee and product safety/quality affected financial performance in the top 100 firms listed in the Fortune 500..

1.2.2. Shared Value Theory

Like the stakeholder theory, the shared value theory presented by Porter and Kramer (2011) also posits benefits from ESG to financial performance. Creating shared value for the surrounding society provides long-term growth opportunities, often intertwined with profits. Moreover, whilst some companies will continue to reap short-term profits at society's expense, competitors with progressive initiatives towards society will gain economic value from three distinct aspects presented by Porter and Kramer (2011). These three aspects are;

1. Products and services that do not just emphasise demand but also create societal benefits for consumers and new production and distribution methods for the firm.
2. Redefined productivity in the value chain from advances in the usage of assets, distribution methods and employee relations.
3. Enabling local cluster development to improve infrastructure for all companies, institutions, and groups to thrive.

Being sustainably driven can allow firms to find new avenues to make a profit and competitive advantage is one of them. The competitive advantage of sustainable actions is covered by Gregory et al. (2014), finding evidence that firms with high CSR have long-run abnormal returns from the competitive advantage they have over their competitors. Porter and Kramer (2011) also discussed competitive advantage, stating that addressing societal concerns can yield productivity benefits. Furthermore, employee well-being and supplier management will increase company productivity and consequently provide a competitive advantage. However, having a competitive advantage does not guarantee it to be sustained in the long run, and other firms may replicate procedures to gain the upper hand. Imitation pressure for sustainably driven firms is discussed by Ioannou & Serafeim (2019); competitive advantage, whilst beneficial, attracts imitation pressure from other firms; however, unique actions can be made to hold their occupied industry positions. Furthermore, unique actions are defined as ones diverging from the standard and are harder to imitate.

1.2.3. Legitimacy Theory

A common take on legitimacy theory was proposed by Suchman (1995). Legitimacy theory is analogous to the shared value theory, and the difference is that companies have verification or legitimacy from society and need to operate responsibly to maintain their status. This legitimacy is constantly evolving, and companies must keep up with the change to maintain their standing. A breach in the social contract will affect the future persistence of the company. ESG scores and performance have been studied from the viewpoint of legitimacy theory, as sustainable behaviour is considered a legitimate action by companies. Support for this argument is found in a study by Shakil et al. (2021), where ESG activities lowered firm total risk in oil and gas firms. Furthermore, the researchers found that high ESG controversy scores had a negative effect on stock price volatility and firm total risk.

Legitimacy theory also promotes the idea of marketing with ESG scores as they are monitored by society to validate if companies are performing as expected, shortly discussed in a paper on

legitimacy theory and environmental practices by Mousa and Hassan (2015). Furthermore, a strong relationship was found by Waddock and Graves (1997) between a company's reputation and CSR commitments. Furthermore, from the automotive industry, a study by Lee et al. (2022) found evidence that ESG scores were used in marketing, thus promoting brand value.

1.3. Previous research

After ESG was introduced in 2005, studies have emerged on its impact on financial performance. Furthermore, ESG scores have proved to be simpler to understand and more quantifiable than corporate social responsibility (CSR) scores, which has helped ESG to gain more popularity. Companies' sustainability is often displayed from the viewpoint of either ESG or CSR and then compared to financial performance, which is why CSR and ESG are separated to view if results from studies differ. Research into this area often presents theory from the lens of social science, presenting performance increases from the viewpoints of stakeholder theory, shared value theory and legitimacy theory.

1.3.1. ESG and performance

From a study conducted in the German market, Velte (2017) found ESG scores to have an impact on financial performance. The study examined 110 firms from the German stock exchange and found a positive impact of ESG performance in relation to return on assets. However, no significant impact on Tobin's Q was found. Another study by Dalal & Thaker (2019) found positive associations between ESG scores and return on assets and Tobin's Q. The study took 65 companies listed in the Indian stock exchange from 2015 to 2017.

Meta-analyses have been performed to evaluate the results of many sustainable and financial performance studies, which held positive results. In the study by Friede et al. (2015) combined the results of 2200 studies on the topics of ESG performance in relation to financial performance, 90% of studies found a nonnegative ESG to the financial performance outcome. The meta-analytical study by Hou et al. (2016) focused on East Asian firms and found positive associations between CSR and performance. Moreover, environmental performance was found to be more impactful towards financial performance than social performance. However, since 2015 progress towards sustainability has increased, which is why it is crucial to view newer meta-analyses. Newer ESG and financial performance results are found in a meta-study by Whelan et al. (2021) from NYU

Stern. The research presented their key takeaways from over 1000 studies from 2015 to 2020. Evidence for financial performance due to ESG was present, and initiatives towards sustainability rewarded better financial performance due to better risk management and more innovation.

1.3.2. CSR and performance

CSR was the sole metric to determine a company's impact on its surroundings before ESG was introduced, and studies were conducted to find a relationship between CSR and financial performance. Now ESG also includes CSR factors in its calculation; however, it is important to view how CSR as a sole metric impacted performance in previous studies. A study by Cochran and Wood (1984) highlighted no substantial relationship between CSR and financial performance; similarly, Aupperle et al. (1985) found no relationship between social responsibility and profitability.

Newer studies on the topic of CSR and financial performance herald different results. A study by Yang et al. (2019) found positive relations between CSR dimensions and return on assets and return on equity in pharmaceutical firms in China. However, only the stakeholder dimension of CSR had a positive significant impact on Tobin's Q. Ikram et al. (2019) studied the effect of CSR and firm performance in the Iranian manufacturing and consumer product firms also found positive and significant relationship between CSR and firm performance represented by return on equity, return on sales, return on assets, return on investment and the net profit margin of the firm.

1.3.3. ESG and CSR and bank performance

From a banking perspective, studies have shown mixed results towards the effect of ESG and financial performance. Most studies on the topic of banks separate the ESG metric into separate pillar scores and then compare the scores to performance indicators such as Tobin's Q, return on assets, return on equity, or stock performance. However, most studies in the field of ESG and banks performance have limitations set by a limited amount of uninterrupted ESG data available. Furthermore, ESG scores are new in the industry which is why historical data over 10 years' time is hard to obtain.

Recent studies on the relationship between ESG and financial performance in the banking sector can be found in different economies, which offers a deeper view on the topic. From the European banking sector, Bătae et al. (2021) investigated banks' ESG and financial performance. For the

study, they used ten dimensions of ESG and compared them to return on assets and market performance. They found only one significant positive relationship between emission reductions and financial performance metrics. However, negative relationships between one social dimension and three governance dimensions were also found. Other dimensions had no significant relationships. Results from a study on ESG and financial performance in emerging markets by Shakil et al. (2019) found a positive association between environmental and social pillar scores and financial performance; however, the governance pillar score had no association with financial performance. The authors speculated low governance association since emerging markets have little to no pressure from legal and social entities towards their governance practices.

1.4. Hypothesis formulation

To assess a firm's performance, ratios give us a solid view of how the company performs with the resources it has. The author considers the market and operational performance separately to measure a company's overall performance. Tobin's Q was selected to evaluate a bank's value and Return on Assets to evaluate a bank's financial performance. To understand why ESG scores affect performance, it is critical to isolate the metric into its quantifiable parts, i.e., pillar scores.

Previous research has used various metrics and ratios to evaluate financial performance. Bătae et al. (2021), in their study on banks' performance and ESG, the researchers used return on assets, return on equity and Tobin's Q to measure performance. Minutolo et al. (2019) used return on assets and Tobin's Q to measure performance. For this thesis, return on average assets and Tobin's Q have been selected to represent the performance of banks. Return on average assets (ROAA) was selected from the Thompson Reuters Eikon data stream along with Tobin's Q (TQ). Return on average assets is used to determine how efficiently a company uses its assets to generate profits and is calculated from the total asset averages from the year. The benefit of ROAA is that it focuses on the average instead of capturing a high or low in a particular situation. Finally, Tobin's Q ratio is measured by the total market value of a company to its asset's replacement cost.

Refinitiv defines the environmental pillar score based on three aspects: resource use, emissions, and innovation. Stakeholder theory should imply better performance from efficiency upgrades in supply chains, however, primarily affecting physical bank products. Legitimacy theory supports the notion of lower emissions which leads to societal validation, which in turn may lower the risk

of a company and increase performance. Furthermore, the recognition gained from customers due to indirect marketing of environmental contributions may lead to better valuation and performance. In addition, the association between performance and the environmental score is mixed. Shakil et al. (2019) found that the environmental pillar score positively affected ROA. From these viewpoints, the following hypotheses regarding the environmental pillar score are defined below.

H1: There is a positive relationship between the environmental pillar score and Tobin's Q
H2: There is a positive relationship between the environmental pillar score and ROAA

The social pillar score by Refinitiv is calculated by four measures: workforce, human rights, community, and product responsibility. Better financial performance and valuation can be explained through the shared value theory, which posits benefits from increased employee productivity and efforts towards better infrastructure to boost companies within a community. Enhanced social contributions should foster better access for companies in other industries to thrive, thus providing better financial performance. Employee relations, a part of the social pillar score, were found to have a positive relationship with ROA by Esteban-Sanchez (2017). However, in the same study, product responsibility was negatively associated with ROA, indicating that whilst the different aspects within the social pillar score might have different relationships with performance. The social pillar score also considers marketing aspects related to products, which can lead to better valuation and performance. The following hypotheses regarding the social pillar scores are defined below from the previous viewpoints.

H3: There is a positive relationship between the social pillar score and Tobin's Q
H4: There is a positive relationship between the social pillar score and ROAA

CSR strategy, Management and Shareholders are all considered by Refinitiv when calculating the governance pillar score. CSR strategy is calculated using a firm's overall CSR strategy and ESG reporting and transparency. From legitimacy theory, support can be found for the added value of transparency in the form of societal validation and the benefits that come with it. Competitive advantage can also be linked to the CSR strategy for a company, as it was found by Gregory et al. (2014) that better CSR led to competitive advantage and, in turn, better financial performance. In previous studies, results on governance and financial performance vary. Peni and Vähämaa (2012) found positive and significant results for governance and ROA; however negatively associated with Tobin's Q. However, a study by Zagorchev and Gao (2015) found financial institutions'

Tobin's Q and governance to be positively associated. From these viewpoints, the following hypotheses regarding the governance pillar score are defined below.

H5: There is a positive relationship between the governance pillar score and Tobin's Q
H6: There is a positive relationship between the governance pillar score and ROAA

A separate model will be made to measure the overall relationship between ESG and financial performance. Moreover, due to multicollinearity issues arising from ESG and its corresponding pillar scores, it is not feasible to incorporate the overall ESG score into the earlier model. Prior studies regarding the ESG metric as a whole have mixed results concerning Tobin's Q. Study from Velte (2017) found positive relations between ESG and return on assets; however, no relations for Tobin's Q. Nevertheless, a study by Wong et al. (2021) examining Malaysian firms found ESG scores to significantly increase Tobin's Q. From a theoretical standpoint good ESG scores should benefit a firm's performance from the eyes of consumers and investors. Corporate practices leading to a better system should create value for stakeholders, and from stakeholder theory, better financial performance can be expected. Legitimacy and shared value theories also posit benefits from positive ESG scores and financial performance. Lastly, the final hypotheses regarding the ESG pillar scores are represented below.

H7: There is a positive relationship between the ESG score and Tobin's Q
H8: There is a positive relationship between the ESG score and ROAA

2. DATA AND METHODOLOGY

This chapter contains this thesis's data selection and research methodology. Introducing first the sample selection and then expanding on the dependent and independent variables. Lastly, a summary of the data and an explanation of this thesis's regression method.

2.1. Sample Selection

The study uses data structured with multiple variables over a certain period of time. Panel data models are used to study the dataset. The time period for this study is 2012-2021. This research uses four determinants to measure a bank's sustainability, three bank control variables, and two to measure a bank's financial performance. Before 2012, ESG scores were sparse, which explains the start date of the data. A link to the data set is presented in appendix 1. The setting for this study is Europe. Countries and the number of banks are represented along with total observations in below in Table 1.

Table 1. Distribution of banks

Country	Listed Banks	Total Observations	Country	Listed Banks	Total Observations
Austria	3	23	Italy	10	56
Belgium	1	9	Liechtenstein	2	7
Czech Republic	2	9	Netherlands	2	13
Denmark	4	34	Norway	6	20
Finland	1	4	Poland	7	41
France	3	29	Portugal	1	8
Germany	5	34	Romania	1	2
Great Britain	8	58	Spain	5	45
Greece	4	16	Sweden	3	29
Ireland	2	7	Switzerland	2	20

Source: Author’s compilation

The setting for this study is Europe. Countries and the number of banks are represented along with total observations in Table 1. The banks represented are stock exchange listed banks in the European Union and include Great Britain, as prior to their withdrawal in 2020, union policies of

sustainability applied. The initial data set represented 123 banks from Europe; however, due to missing data and removing outliers, the amount changed to 72 banks from 20 different European countries. The country with the most banks on the list is Italy, with ten banks, and the least were from four different countries, Belgium, Portugal, Romania and Finland.

ESG and pillar score data was collected from Thompson Reuters Eikon DataStream, and financial ratios from Moody's Analytics BankFocus database. BankFocus gathers data from Moody's Investors Service and Bureau van Dijk. Thompson Reuters ESG Research data generates ESG scores on a yearly basis. The chosen software for pre-processing data was Excel and statistics handling was STATA.

2.2. Measurement of variables

Measurement determinants in this thesis are based on previous studies relating to ESG and bank performance specifically. Differences in ratio calculations are present as the variation in ratios of previous research is varied, and the lack of information available also poses limits.

2.2.1. Dependent Variable

The dependent variables for this thesis are Tobin's Q and Return on Average Assets (ROA). Tobin's Q is calculated by the market value of a company divided by its assets' replacement costs. Tobin's Q is calculated in Formula 1 below.

$$Tobin's\ Q = \frac{Enterprise\ market\ value}{Total\ asset\ replacement\ cost} \quad (1)$$

Return on average assets is calculated by the net income of a company divided by the average total assets value of a company. The calculation of ROAA is presented below in Formula.

$$Return\ on\ Average\ Assets\ (ROAA) = \frac{Net\ Income}{Average\ total\ assets\ value} \quad (2)$$

2.2.2. Independent variables

ESG scores used in this study have been made by Refinitiv. The ESG score is represented by its own independent variable. ESG is also separated into its components, pillar score variables which are used as independent variables. Independent variables are presented below in Formulas 3 to 6.

$$ESG = Evironmental, social, governance\ score \quad (3)$$
$$ENV = Environmental\ pillar\ score \quad (4)$$
$$SOC = Social\ pillar\ score \quad (5)$$
$$GOV = Governance\ pillar\ score \quad (6)$$

2.2.3. Control variables

Extant literature has used bank-specific control variables to enhance the internal validity of the regression models. To avoid biased results, equity ratio, size and cost-to-income ratio were added as control variables. The cost-to-income ratio was chosen as a control variable to evaluate a bank's efficiency, also used in a study by Wu & Shen. (2013) found a significant negative relationship with performance indicators.

Equity to asset ratio was found to have significant positive relationships with bank performance metric return on assets in a study by Shen et al. (2016). The equity ratio is used as an equity ratio to illustrate how a company finances its assets. The equity-to-asset ratio is calculated by the total equity of a firm divided by its total assets, displayed below in Formula 7.

$$Equity\ to\ asset\ ratio(EAR) = \frac{Total\ equity}{Total\ assets} \quad (7)$$

Prior studies on banks and performance utilize the size variable as a control variable using the natural logarithm of total assets to evaluate size. Negative significant relationships with size and performance indicators were found by Shakil et al. (2019). The size variable is calculated by taking the log from total assets, which is represented below in Formula 8.

$$SIZE = ln(Total\ assets) \quad (8)$$

The cost-to-income ratio was chosen as a control variable to evaluate a bank's efficiency, also used in a study by Wu & Shen. (2013) found a significant negative relationship with performance

indicators. The cost to income ratio is calculated by the operating expenses divided by operating income shown below in Formula 9.

$$Cost\ to\ income\ ratio = \frac{Operating\ expences}{Operating\ income} \quad (9)$$

2.3. Descriptive statistics

Descriptive statistics are presented in Table 2. It represents summary statistics from the sample selection. Mean, minimum, first quartile, median, third quartile, maximum, standard deviations, and number of observations are illustrated in the table.

Table 2. Descriptive statistics

	Minimum	1st Quartile	Median	3rd Quartile	Maximum	Mean	St. Dev	N
TOBINSQ	0.004	0.030	0.049	0.079	0.235	0.062	0.044	464
ROAA	-0.907	0.230	0.483	0.783	2.068	0.530	0.459	464
ESG	0.116	0.524	0.688	0.795	0.946	0.645	0.187	464
ENV	0.013	0.501	0.809	0.891	0.975	0.680	0.268	464
SOC	0.030	0.537	0.707	0.806	0.977	0.657	0.202	464
GOV	0.060	0.473	0.649	0.814	0.970	0.619	0.220	464
EAR	0.027	0.054	0.066	0.083	0.158	0.072	0.025	464
CIR	0.364	0.528	0.596	0.707	1.166	0.622	0.135	464
SIZE	8.61	10.65	12.19	13.46	14.78	11.99	1.64	464

Source: Author's own calculations.

ESG and its pillar score values are represented on a scale of 0 to 1, with 0 representing the worst and one the best. The mean ESG score for the sample is 0.64 out of 1. Scores above 0.7 are commonly classified as good scores, and scores below 0.5 are considered bad ratings. The sampled banks in the study received scores from both ends, with the highest being 0.946 and the lowest 0.116. The ESG mean score can be understood as a high average score. Environmental, social, and governance scores have similar means to the ESG score since they are used to compile the aggregate ESG score. The mean return on average assets score is 52.8%, and Tobin's Q mean 0.062. These scores seem low; however, as banks are capital-intensive companies, the total asset values are inherently higher than normal firms.

To evaluate the correlation between variables, a correlation matrix was made, which is presented below. Table 3 represents a correlation matrix made from the sample data set. This matrix includes the dependent variables Tobin's Q and ROAA and independent variables ESG score, pillar scores, equity assets ratio and bank size variable. Pillar scores have positive relationships with each other and might lead to results where independent variables can predict other independent variables in a regression model. Furthermore, multicollinearity needs to be tested for the data set to determine the accuracy of the results. Both Tobin's Q and Return on Average Assets have moderate relationships with equity to asset ratio. All pillar scores have a negative relationship with Tobin's Q and ROA; all are weak in nature.

Table 3. Correlation matrix

	TOBINSQ	ROAA	ESG	ENV	SOC	GOV	LEV	CIR	SIZE
TOBINSQ	1								
ROAA	0.751	1							
ESG	-0.312	-0.249	1						
ENV	-0.330	-0.289	0.730	1					
SOC	-0.353	-0.226	0.896	0.703	1				
GOV	-0.108	-0.155	0.779	0.384	0.520	1			
EAR	0.594	0.565	-0.342	-0.452	-0.339	-0.176	1		
CIR	-0.418	-0.529	0.222	0.145	0.221	0.196	-0.341	1	
SIZE	-0.511	-0.499	0.662	0.707	0.633	0.469	-0.678	0.405	1

Source: Author's own calculations.

To further understand has there been any significant changes to ESG scores, average values for different years were graphed to the following figure (see Figure 1). The y-axis represents the scores within the range of 0.4 to 0.8, and the x-axis represents the years from 2012 to 2021. From the figure, it can be noticed that ESG has a mild upward trend along with both the social and governance pillar scores, as all three scores rose from around 0.6 to around 0.7. As ESG is formed from all three pillar scores, it can be seen how all pillar scores move close by the ESG line. The environmental score declined rapidly from 0.75 to 0.6 after 2016, after which it rose to similar levels as the other scores. Whilst figure 1. represents the total amount of ESG scores in the dataset, including the banks with complete scores for all years heralds a similar graph with little to no difference from figure 1.

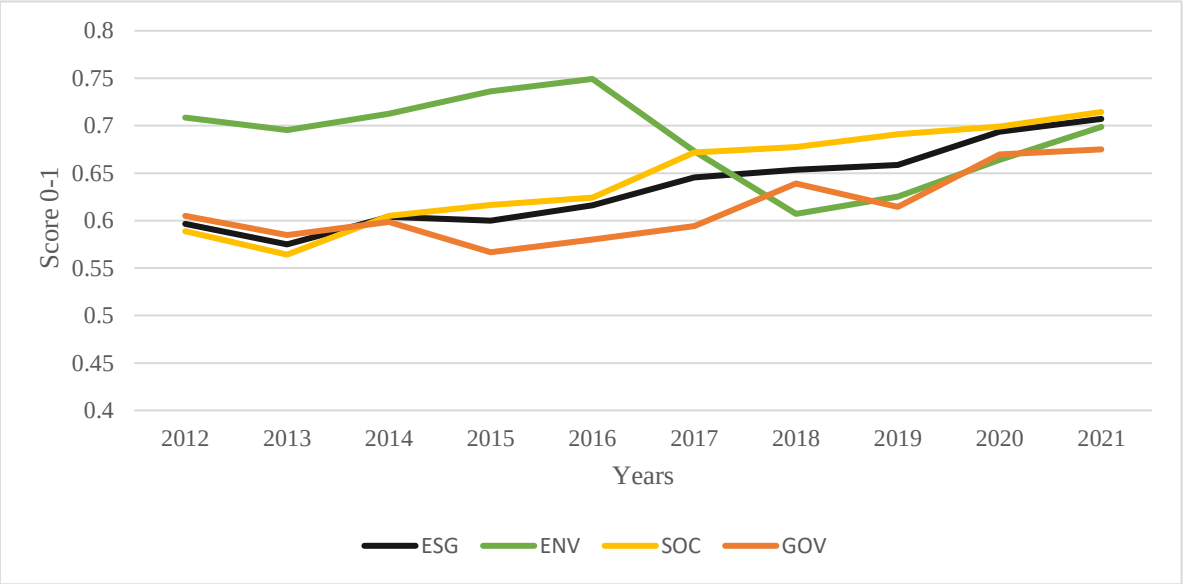

Figure 1. Yearly average values for all ESG and pillar scores

Source: Authors own calculations

2.4. Research methodology

The data set used for this study is based on different bank data for different years, which is why panel data is used to evaluate the data set. To answer the hypothesis outlined in chapter 1.4 and to gain a better view of how pillar scores affect performance, separate regression models are developed. Regression with all pillar scores is used to understand the effect ESG practices have on performance, and separate regressions with scores separately are used to evaluate the direct relationships between specific scores and the dependent variables.

The most common regression models used for panel data are the random effects model and fixed effects model when evaluating the effects of pillar scores on financial performance. In short, the fixed effect model evaluates the leftover variation explained by the independent variables, and the random effects model assumes that the variation is uncorrelated with independent variables. Prior research on ESG metrics and financial performance have used either one of the models depending on the dataset in question. To determine which model to use, the Hausman test is employed. Hausman test evaluates the endogeneity in a model or, in other words, evaluates their correlation with the predictor variables of the model and the error term. Two separate regression models were

formed for each independent variable to estimate the relationship between pillar scores and performance. Separate fixed effects and random effects models were made to evaluate with the Hausman test which model best suited the specific regressions. The general equations used for the regression models are represented below, starting with the fixed effects model represented by Formula 10, followed by the random effects model represented by Formula 11. To clarify, the dependent variables Tobin's Q and ROAA are represented by variable y and the independent variables are represented by x. The regression models are represented in a general form as different variations of the models are used for regressions.

Fixed effects model: $y_{it} = \alpha_i + \beta_1 X_{it} + \beta_2 X_{it} + \ldots + \beta_n X_{it} + \varepsilon_{it}$ (10)
where
y = dependent variable,
α_i = intercept for each individual,
β = estimated coefficient,
x = independent variable,
ε = error term

Random effects model: $y_{it} = \alpha + \beta_1 X_{it} + \beta_2 X_{it} + \ldots + \beta_n X_{it} + \varepsilon_{it} + u_{it}$ (11)
where
y = dependent variable,
α = common intercept,
β = estimated coefficient,
x = independent variable,
ε = error term
u = random error

To address multicollinearity issues that might occur from independent variables predicting each other in the multiple regression model, the Variable Inflation Factors or VIF test is used. Multicollinearity in the model will make interpreting the results between the independent and dependent variables difficult. If the result of the VIF test is lower than five, there might be a moderate correlation however does not need to be corrected. If the result is over five, the model needs to be corrected. Also, the distribution of the data needs to be tested, and the Shapiro-Wilk Normality test is being used to evaluate the distribution. The null hypothesis for the test is stated to be that data is normally distributed and the alternative as non-normal.

Autocorrelation must be addressed for the model as variables can have relationships between their past values, which is why it needs to be evaluated to create a more accurate model. For example, if a governance pillar score is high one year, it is more likely to be high the following year. To test for serial correlation, the Wooldridge test is applied. The test assumes the null hypothesis on the

data stating that no first-order autocorrelation exists. Therefore, rejecting the null hypothesis would entail serial correlation to be present in the data and require to be adjusted for the regression analysis.

To control for variables that are constant across entities but change with time, time-fixed effects dummy variables are implemented into the panel data model. It is also essential to see if the variance in values starts to change as for this data set, this might be a possibility as more emphasis on pillar scores is made in the later years since they have become more prominent in the media and business. Also, more accurate tools to evaluate ESG and its pillar scores are now available, which can alter the variance of results further on. Depending on the model, different tests are used to evaluate heteroskedasticity. For fixed effect models, the modified Wald test statistic is used to evaluate if there is groupwise heteroskedasticity in the data. For random effects models, the Breusch- Pagan test is employed to evaluate if heteroskedasticity occurs in the data. If heteroskedasticity is present in the data, it needs to be addressed to gain more accurate results.

3. ANALYSIS AND DISCUSSION

In this chapter, findings and discussion is presented to study the effects ESG has on the financial performance of banks in the years 2012-2021. Starting with an analysis of the regression outputs followed by a discussion comparing results to the previous theoretical and empirical literature.

3.1. Regression analysis

In this chapter, two separate analyses will be presented. Firstly the combined model with all pillar scores will be analysed, followed by the analysis of the individual ESG score models. A separate analysis of both models gives further insight into the relationship between ESG scores and performance indicators.

The combined model is represented below in table 4. The dependent variables are represented by their respective columns. Independent variables have their coefficient values displayed with the inclusion of p-values in brackets below the coefficients. The different R-squared variables are present along with the Hausman test and the model. An asterisk represents statistical significance after the p-value. The overall R squared of the models were (40.18%) for the Tobin's Q model and (47.39%) for the ROAA model. The number of observations remained the same for both models the number being 464 observations on 72 banks. F-test and Wald tests statistics are presented the at bottom of table 4. From the regression output, significant values are found for both regression models. Coefficients for size and cost-to-income ratio were negative, with size p-values less than the 0.05 significance level and CIR p-values less than the 0.01 significance level indicating a significant negative relationship with the dependent variables.

Table 4. Combined pillar score regression model output

Combined model	Tobin's Q	ROAA
ENV	-0.007	-0.146
	(0.452)	(0.215)
SOC	0.0087	0.4655
	(0.492)	(0.011)*
GOV	0.0135	0.2719
	(0.04)*	(0.018)*
EAR	0.308	4.7557
	(0.133)	(0.027)*
SIZE	-0.0169	-0.089
	(0.024)*	(0.019)*
CIR	-0.049	-1.4719
	(0.001)**	(0.000)***
R2 within	0.4099	0.4018
R2 between	0.3537	0.4707
R2 overall	0.4018	0.4739
F (15,71)	12.54***	-
Wald X2 (15)	-	272.06***
Observations	464	464
Hausman	0.0331*	0.8169
Fixed of Random	FE	RE

Source: Author's own calculations

Notes:

1. Statistical significance, * 0.05, ** 0.01, *** 0.001

With return on average assets as the dependent variable, all variables were statistically significant except for the environmental pillar score. The governance pillar score had a significant relationship with both dependent variables. The governance pillar score coefficients were 0.0135 and 0.2719 for Tobin's Q and ROAA models respectively. Both p-values were less than the 0.05 significance level indicating significant positive relationships with the dependent variables. The social pillar score had no significant relationship with Tobin's Q; however, it had a significant positive relationship with ROAA as the dependent variable. Environmental pillar scores had no significant relationship with either dependent variable. The Hausman test was performed to determine which regression model was to be used. If the P-value of the Hausman test is under 0.05, the null hypothesis can be rejected and use the fixed effects model. If the P-value exceeds 0.05, the null hypothesis cannot be rejected, and the random effects model is employed. Results of the Hausman test are portrayed at the bottom of table 4. The fixed effects model was used for Tobin's Q model, and the random effects model will be used for the ROAA model.

Regression results for the independent models will be portrayed by splitting the dependent variables into two tables. Tobin's Q models are represented below in Table 5. Hausman tests for the models are displayed at the bottom of the table. All models with Tobin's Q used fixed effects panel data regression models, except for the social pillar score model, which used random effects.

Table 5. Independent model Tobin's Q regression outputs

Tobin's Q	ENV	SOC	GOV	ESG
ENV	-0.0056			
	(0.556)			
SOC		0.0095		
		(0.436)		
GOV			0.0144	
			(0.024)*	
ESG				0.0177
				(0.223)
EAR	0.3146	0.4821	0.3096	0.3103
	(0.128)	(0.011)*	(0.135)	(0.130)
SIZE	-0.0137	-0.0088	-0.0169	-0.0183
	(0.044)*	(0.005)**	(0.015)*	(0.012)*
CIR	-0.0467	-0.0497	-0.0496	-0.0474
	(0.001)**	(0.000)***	(0.001)**	(0.000)***
R2 within	0.4021	0.3988	0.4076	0.4048
R2 between	0.3386	0.3944	0.3557	0.342
R2 overall	0.396	0.439	0.4056	0.3913
F (4,71)	8.26***		13.78***	14.19***
Wald X2 (4)		186.49***		
Observations	464	464	464	464
Hausman	0.015*	0.0503	0.001**	0.046*
Fixed of Random	FE	RE	FE	FE

Source: Author's own calculations

Notes:

1. Statistical significance, * 0.05, ** 0.01, *** 0.001

Regressions results for the independent where Tobin's Q is the dependent variable find only one pillar score variable statistically significant with the dependent variable. The governance pillar score coefficient was 0.0144, and the p-value was less than 0.05 providing evidence for a significant positive relationship for Tobin's Q. Size, and cost-to-income ratio were both statistically significant with both variables having negative coefficients indicating negative relationships with Tobin's Q. Only in the social pillar score model equity ratio was statistically significant having a positive relationship with the dependant variable.

Lastly, the independent regression models with return on average assets as the dependent models are presented below in Table 6. The Hausman test was estimated to determine the model types for each regression model. For all of the models, random effects were used.

Table 6. Independent model ROAA regression outputs

ROAA	ENV	SOC	GOV	ESG
ENV	-0.0234			
	(0.854)			
SOC		0.4595		
		(0.017)*		
GOV			0.3308	
			(0.002)**	
ESG				0.5523
				(0.006)**
EAR	5.5258	5.1684	4.8775	4.9846
	(0.016)*	(0.017)*	(0.03)*	(0.026)*
SIZE	-0.0392	-0.0847	-0.0702	-0.0905
	(0.286)	(0.019)*	(0.038)*	(0.023)*
CIR	-1.4335	-1.4086	-1.4885	-1.4423
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
R2 within	0.364	0.3893	0.3937	0.4016
R2 between	0.4834	0.4912	0.4657	0.4591
R2 overall	0.4907	0.4812	0.4815	0.4741
Wald X2 (4)	268.18	260	274.54	266.53
Observations	464	464	464	464
Hausman	0.4021	0.3988	0.4076	0.4048
Fixed of Random	RE	RE	RE	RE

Source: Author's own calculations

Notes:

1. Statistical significance, * 0.05, ** 0.01, *** 0.001

Equity and cost-to-income ratios were both statistically significant with ROAA in all models. CIR had a statistically negative relationship with ROAA, having negative coefficients in all models and p-values less than 0.001, whilst the equity ratio had a significant positive relationship at a 95% confidence level. The size variable had negative coefficients in all models and was statistically significant in all except the environmental pillar score model. The individual pillar scores and ESG scores had significant positive relationships with the dependent variable, except for the environmental pillar score. The social pillar score was positively significant with a 95% confidence level, and governance and ESG scores were positively significant with a 99% confidence level.

The combined and individual regression models found similar behaviour regarding pillar scores. The governance pillar score was significant in both models with Tobin's Q as the dependent variable, and the other pillar score variables, including ESG, did not exhibit any significant relationship with Tobin's Q. From the pillar scores, only the environmental pillar score did not exhibit any significant relationship with ROAA whilst others did. The presented regression results have been adjusted separately to account for autocorrelation and heteroskedasticity to add robustness to the models. Time-fixed effects were also added as dummy variables to the models to control for variables that are constant across entities but change with time. To measure the strength of the correlation between independent variables, the VIF test was used. No strong multicollinearity in the data was found. Normality for the sample was also tested through the Shapiro-Wilk test. Evidence that the sample is not normally distributed was found. However, the sample size for this data is large and non-normal distribution is assumed. The Hausman tests for each model along with tests for multicollinearity, normality, autocorrelation and heteroskedasticity are all presented in Appendix 2.

Further robustness for the study results was analysed by running a basic robustness check, where regressors were removed one at a time to see if the crucial regressors of the models followed the same behaviour. Robustness checks were suggested by Lu & White (2014) as an important way to find if the critical core variables are sensitive to the dropping or adding of variables determining the overall validity of the model. The robustness checks found that the governance pillar score variable was statistically significant in all independent models and the social pillar score was statistically significant in all combined models. ESG and the social pillar scores were significant with ROAA in two of the three individual pillar score test models. The governance pillar score only had one significant result with Tobin's Qin three models. Robustness checks are listed in detail in appendices 3 to 5.

3.2. Results and Discussion

Hypotheses for this research and their respective results have been compiled below to Table 8. For each hypothesis separate regression models were estimated and compared to come to a conclusion. From the total of eight hypotheses four were rejected. Most rejected hypotheses were found to be related to Tobin's Q as the dependent variable.

Table 8. Summary of hypothesis

Hypothesis	Description	Conclusion
H1	There is a positive relationship between the environmental pillar score and Tobin's Q	Rejected
H2	There is a positive relationship between the environmental pillar score and ROAA	Rejected
H3	There is a positive relationship between the social pillar score and Tobin's Q	Rejected
H4	There is a positive relationship between the social pillar score and ROAA	Failed to reject
H5	There is a positive relationship between the governance pillar score and Tobin's Q	Failed to reject
H6	There is a positive relationship between the governance pillar score and ROAA	Failed to reject
H7	There is a positive relationship between the ESG score and Tobin's Q	Rejected
H8	There is a positive relationship between the ESG score and ROAA	Failed to reject

Source: Author's compilation

Environmental pillar scores had no significant relationships with either of the dependent variables. Prior studies have found mixed results on the environmental pillar score and performance metrics across different industries. A study on ESG activities and their effect on performance by Xie et al. (2019) found positive relationships between the environmental activities of firms on their performance. Focusing more specifically on banks, similar results can be found in a study by Bătae et al. (2021) found environmental performance, when divided further into parts, to have mostly no significant results. Furthermore, the only variable to have any significant relationship with one of the dependent variables was waste reduction's significant relationship with ROA. Limitations

within the sample size may also affect the results as more banks and metrics would produce a clearer picture. Focusing on different regions would allow for more comprehensive results. Hypotheses one and two were rejected as no evidence to support the hypotheses was found.

Social pillar scores had a significant positive relationship with ROAA in both models, the single variable model and the combined model with all the pillar scores. The p-values between the two models were less than the 0.05 significance level, and the H4 indicating a positive relationship with return on average assets and support was found for hypothesis four. However social pillar score had no significant relationship with Tobin's Q, and H3 was rejected. From a theoretical standpoint, the shared value theory supports the positive relationship between the social pillar score and ROAA, implying that better working conditions may benefit employee productivity, thus enhancing performance. Similar observations were found in the study by Velte (2017), which was focused on German companies and return on assets was the only ROA having a significant positive relationship with the social pillar score and Tobin's Q with no significant link with the social pillar score. Contrary results for this study were ones by Bătae et al. (2021), finding significant negative relationships between the social pillar score parts product responsibility and CSR strategy on ROA. Moreover, the sample years and the number of banks might explain the differences between studies. The study by Bătae et al. (2021) was performed with 39 European banks through the years of 2010 to 2019, whilst this study had 72 European banks from 2012 to 2021, which includes a recession years caused by the Covid-19 pandemic. To sum up, possible ways to increase the operational performance of a bank may include ways to enhance their social score by bettering working conditions, addressing diversity issues and futher improveing contributions to the overall society.

From both models, the governance pillar score had a significant positive relationship with both dependent variables. Support was found for both hypotheses five and six, as a positive relationship with governance pillar scores and the dependant variables Tobin's Q and ROAA was found. The positive relationship with governance is supported by the legitimacy theory, which implies that higher sustainable reporting standards increase the valuation and performance of a firm. These findings are partially contradictory with the ones by Peni & Vähämaa (2012), who also came across positive relationships with the governance of banks and their return on assets and no significant relationship with Tobin's Q. It is essential to note that the governance pillar score's behaviour in the robustness checks appears to be mostly nonsignificant to the relationship with Tobin's Q, having only one other significant variable in the robustness checks. Overall, neither of

the hypotheses could be rejected. From these findings, banks could implement better governance structures and focus more on stakeholder engagement which may improve financial performance.

The ESG score variable was used only in the single variable regression model as collinearity issues arise with including it in the aggregate pillar score model. ESG had no association with Tobin's Q; however, there was a significant positive link with ROAA. Therefore hypothesis 7 is rejected, and as support is found for hypothesis 8, it is failed to be rejected. The stakeholder and shared value theories support the relationship between ESG and ROAA. Best practices from sustainable value creation should provide a competitive advantage that may influence performance. Similar findings were presented by Velte (2017) with ROA and Tobin's Q. From a theoretical standpoint, the relationship between ESG and ROAA is supported by the stakeholder theory and shared value theory as best practices from sustainable value creation should provide a competitive advantage which may influence performance. Studying the pillar scores separately yields a more indepth view on the relationship with operational performance and ESG, finding the relationship to be positively significant on the grounds that the societal and governance factors might be affecting it.

Control variables had significant relationships within the models. The size variable had a significant negative relationship in all regression models except the environmental pillar score model, with ROAA as the dependent variable. This may imply that banks with smaller asset amounts are more profitable than large ones. The equity ratio variable had a positive relationship with ROAA in all models, suggesting that the large proportion of equity to assets enhances financial performance. The cost-to-income ratio had a significant negative relationship within all the models with the dependent variables, indicating that banks with a high cost-to-income ratio would diminish their financial performance. Time-fixed effects were positively significant for most years; however, negative statistical significance was found for the year 2020 for most of the regression models implying the adverse effects of the pandemic towards performance.

CONCLUSION

This study aimed to determine how ESG measures affect financial performance within European banks. The rationale behind the study was to bring further attention to banks' sustainability practices and evaluate if they are effective in producing value and performance in the European sector. The sample size included 72 banks from 20 different European countries. Banks were specified to one's offering banking services to clients. The years for which data was gathered were limited due to scarce information available on ESG scores, which trimmed the years used to be from 2012 to 2021. The sample for this study required the use of panel data which required the author to find a suitable model. After testing models with the Hausman test, Tobin's Q dependent variable was used with the fixed effects model and the return on average assets dependent variable with random effects. Tests for heteroskedasticity and autocorrelation were also performed and later implemented to increase the accuracy of the models.

The independent variables of this thesis were the ESG pillar scores and ESG as a separate variable. Control variables size, equity ratio, and cost-to-income ratio were added to avoid biased results. In total, ten different regression models were made for this study. As there were two dependent variables, the number of models was inherently high. Two models were made to observe the combined effect of all pillar scores on the dependent variables, and six models were made to assess the individual effects of the pillar scores on the dependent variables. Lastly, two models were made to evaluate ESG scores on the dependent variables. To further stress the point, this thesis does not imply causality between the independent and dependent variables; it merely provides evidence of relationships that might transpire from the analysis.

ESG and its relationship to performance have been studied for many different industries; however, conclusive evidence of a definite relationship is debated. Moreover, meta-analytical studies have found non-negative relationships between ESG and financial performance. From the banking sector, studies suggest positive relationships between ESG scores and financial performance. However, the studies have mostly used similar variables to study performance which may limit the accuracy of results.

The research question for this thesis was:

· Are ESG Scores related to a bank's financial performance?

To answer the research question, eight hypotheses were made to evaluate ESG scores and their pillar score variables with two dependent variables as performance measures. Only one variable was found to have a significant relationship with bank market performance Tobin's Q, specifically the governance pillar score. Nevertheless, positive relationships were found for some independent variables and the operational performance measure ROAA. Most notably, the ESG score variable had a significant positive relationship with return on average assets, most likely stemming from the social pillar score and governance score, which also had positive relationships with ROAA. Therefore, the answer to the research question is that ESG scores, except the environmental pillar score, are related to operational performance within European banks and have only one significant relationship with market performance. Furthermore, operational performance is affected by the social and governance aspects of the ESG score.

Based on this study's results, suggestions for European banks are general improvements towards social and governance issues that may benefit financial performance. Contributions towards improved ESG scores may benefit banks in the long run. Whilst no causality can be said from this study, a relationship between the social and governance pillar scores may benefit a bank's operational performance. Improvements towards the workforce, the surrounding community, governance structures and the overall CSR strategy can enhance a bank by providing access to competitive advantage and an overall streamlined workflow. Nevertheless, the environmental pillar score did not have any significant relationship with the performance indicators and may not be a priority whilst deciding on performance upgrades.

Limitations also need to be noted. First, the sample size for a study on the scale of Europe could be more extensive; however, due to the scarce availability of ESG data due to its relatively recent introduction into the business world, the sample size is limited. Different geographical locations could be used to generate a larger sample to examine further how financial performance is affected by ESG scores. Furthermore, as ESG metrics are not yet based on a rigid formula and their evaluation is done by independent rating agencies, different scores can alter the outcomes of the analysis. Due to the inherent nature of ESG scores and the sample size, no decisive conclusion can be made from the regression. However, it can provide rough estimates of the relationships between ESG scores and the financial performance of banks.

For further research, an interesting avenue to study would be to determine the overall impact ESG scores have on company performance, analysing not only the financial performance but also from the viewpoint of customer satisfaction and loyalty. Also, including banks from different regions and comparing them to find regional-specific characteristics could be an interesting avenue to research. Another interesting research topic would be to compare different rating agencies to determine a more accurate overall score, which would benefit the literature in finding a more coherent conclusion. Lastly, using different metrics to evaluate banks' performance is also something to consider for future research.

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Appendix 1. Link to dataset

https://docs.google.com/spreadsheets/d/1-GZ2HkcWHJZ8vfBKkUZ9pkKECqdwsS3GBWat6CtXtEg/edit?usp=sharing

Appendix 2. Tests on Data

	Hausman test		Autocorrelation	Heteroskedasticity	
	test result	model type	wooldridge	wald	breush-pagan
Combined model					
Tobin's Q	0.0331	FE	0.0006	0.000	
ROAA	0.8169	RE	0.2233		0.000
ENV model					
Tobin's Q	0.0151	FE	0.0011	0.000	
ROAA	0.0974	RE	0.1653		0.000
SOC model					
Tobin's Q	0.0503	RE	0.0009		0.000
ROAA	0.8097	RE	0.2017		0.000
Gov model					
Tobin's Q	0.0014	FE	0.0005	0.000	
ROAA	0.2463	RE	0.1228		0.000
ESG model					
Tobin's Q	0.0467	FE	0.0009	0.000	
ROAA	0.2906	RE	0.1435		0.000

VIF test	Combined model	ENV	SOC	GOV	ESG
Env	2.7	2.1	-	-	-
Soc	2.41	-	1.71	-	-
Gov	1.49	-	-	1.35	-
Esg	-	-	-	-	1.86
Ear	1.98	1.87	1.92	1.97	1.94
Lnsize	3.83	3.3	2.95	2.53	3.19
Cir	1.27	1.27	1.21	1.21	1.21
Mean	2.28	2.14	1.95	1.77	2.05

Shapiro-Wilk test variable	obs.	w	v	z	prob>z
Tobinsq	464	0.87071	40.663	8.877	0.000
Roaa	464	0.97682	7.29	4.759	0.000
Esg	464	0.93746	19.67	7.137	0.000
Env	464	0.84409	49.034	9.325	0.000
Soc	464	0.93643	19.993	7.176	0.000
Gov	464	0.94872	16.129	6.662	0.000
Ear	464	0.91942	25.345	7.744	0.000
Lnsize	464	0.95149	15.256	6.528	0.000
Cir	464	0.96199	11.956	5.944	0.000

Appendix 3. Robustness Check: Results without variable CIR

	Pillar score model		Tobin's Q Independent model				ROAA Independent models			
	Tobin's Q	ROAA	ENV	SOC	GOV	ESG	ENV	SOC	GOV	ESG
ENV	- 0.0071755 (0.480)	-0.1102734 (0.382)	-0.0049971 (0.616)				0.0201076 (0.867)			
SOC	0.0124178 (0.335)	0.5215056 (0.006)*		0.0115852 (0.368)				0.5130707 (0.004)**		
GOV	0.0098531 (0.141)	0.18164 (0.131)			0.0110591 (0.089)				0.2460806 (0.031)*	
ESG						0.0171775 (0.222)				0.555684 (0.002)**
SIZE	0.3029323 (0.141)	6.026618 (0.004)**	-0.0198236 (0.008)**	-0.0233229 (0.003)**	-0.0225885 (0.003)**	-0.0241692 (0.002)**	-0.0736138 (0.056)	-0.118151 (0.002)**	-0.0926167 (0.016)*	-0.1200259 (0.004)**
EAR	- 0.0232713 (0.003)**	-0.1206417 (0.002)**	0.3090443 (0.138)	0.3038592 (0.14)	0.3059658 (0.143)	0.3054581 (0.14)	6.59158 (0.003)**	6.238787 (0.003)**	6.21813 (0.006)**	6.138907 (0.005)**
R2 within	0.3812		0.375	0.3765	0.3779	0.3775	0.2491	0.2789	0.2668	0.2821
R2 between	0.3004		0.2878	0.29	0.3003	0.2939	0.3558	0.3663	0.3395	0.3372
R2 overall	0.3466		0.3434	0.339	0.3506	0.3429	0.3719	0.3636	0.3648	0.3607
F(14,72)/(12,72)	11.16		11.49	11.9	11.11	11.37				
Wald X2 (14)/(12)		172.36					138.76	153.89	149.21	142.89
Fixed of Random	Fe	RE	FE	FE	FE	FE	RE	RE	RE	RE

Source: Author's own calculations

Notes:

1. Statistical significance, * 0.05, ** 0.01, *** 0.001

Appendix 4. Robustness Check: Results without variable SIZE

	Pillar score model		Tobin's Q Independent model				ROAA Independent models			
	Tobin's Q	ROAA	ENV	SOC	GOV	ESG	ENV	SOC	GOV	ESG
ENV	-0.0098 (0.276)	-0.2368 (0.041)*	-0.0086 (0.336)				-0.0824 (0.48)			
SOC	0.0038 (0.742)	0.3775 (0.023)*		-0.0002 (0.988)				0.2964 (0.076)		
GOV	0.0118 (0.095)	0.2105 (0.073)			0.012 (0.079)				0.2498 (0.023)*	
ESG						0.0087 (0.52)				0.333 (0.057)
EAR	0.4423 (0.027)*	6.9205 (0.000)***	0.4285 (0.031)*	0.6665 (0.000)***	0.4549 (0.022)*	0.4569 (0.021)*	6.5476 (0.000)***	7.4182 (0.000)***	6.9646 (0.000)***	7.3567 (0.000)***
CIR	-0.0523 (0.000)***	-1.5304 (0.000)***	-0.0497 (0.000)***	-0.0545 (0.000)***	-0.0528 (0.000)***	-0.0507 (0.000)***	-1.4683 (0.000)***	-1.4791 (0.000)***	-1.5308 (0.000)***	-1.5016 (0.000)***
R2 within	0.401	0.4082	0.3959	0.3877	0.3978	0.3942	0.3637	0.382	0.3878	0.3883
R2 between	0.3868	0.4462	0.3746	0.3881	0.3685	0.358	0.4762	0.4621	0.4448	0.4389
R2 overall	0.4181	0.4606	0.4163	0.4353	0.405	0.3941	0.4883	0.4674	0.4695	0.461
F (14,72)/(12,72)	13.24***		15.31***		14.72***	15.18***				
Wald X2 (14)/(12)		293.51***		172.77***			276.88***	278.09***	288.53***	281.91***
Fixed of Random	FE	RE	FE	RE	FE	FE	RE	RE	RE	RE

Source: Author's own calculations

Notes:

1. Statistical significance, * 0.05, ** 0.01, *** 0.001

Appendix 5. Robustness Check: Results without variable EAR

	Pillar score model		Tobin's Q Independent model				ROAA Independent models			
	Tobin's Q	ROAA	ENV	SOC	GOV	ESG	ENV	SOC	GOV	ESG
ENV	-0.007	-0.1443	-0.0054				-0.0195			
	(0.447)	(0.216)	(0.557)				(0.875)			
SOC	0.0092	0.4918		0.0097				0.5068		
	(0.482)	(0.009)**		(0.44)				(0.011)*		
GOV	0.0137	0.3397			0.0147				0.4001	
	(0.036)*	(0.003)**			(0.021)*				(0.000)***	
ESG						0.0182				0.6731
						(0.21)				(0.001)**
SIZE	-0.0241	-0.1492	-0.0209	-0.0152	-0.024	-0.0254	-0.1008	-0.1467	-0.1287	-0.1556
	(0.001)**	(0.000)***	(0.002)**	(0.000)***	(0.000)***	(0.000)***	(0.001)**	(0.000)***	(0.000)***	(0.000)***
CIR	-0.0499	-1.5317	-0.0477	-0.0524	-0.0506	-0.0484	-1.4904	-1.4613	-1.5561	-1.5048
	(0.001)**	(0.000)***	(0.001)**	(0.000)***	(0.001)**	(0.001)**	(0.000)***	(0.000)***	(0.000)***	(0.000)***
R2 within	0.4013	0.4124	0.3931	0.39	0.3989	0.396	0.3593	0.3836	0.3897	0.3978
R2 between	0.2861	0.4132	0.2658	0.2882	0.2874	0.2772	0.4026	0.4258	0.4046	0.3944
R2 overall	0.3413	0.4256	0.3305	0.3518	0.3441	0.3326	0.4265	0.4252	0.4295	0.419
F (14,72)/(12,72)	12.91		15.72		14.77	15.17				
Wald X2 (14)/(12)		244.75		193.02			245.15	233.36	251.13	241.09
Fixed of Random	FE	RE	FE	RE	FE	FE	RE	RE	RE	RE

Source: Author's own calculations

Notes:

1. Statistical significance, * 0.05, ** 0.01, *** 0.001

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