Πανεπιστήμιο Κύπρου

Firm Value: Does ESG matter?

Master Thesis in Finance

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Abstract

Investments in companies worldwide are increasing dramatically, with Europe presenting a wide range of countries with different regulatory frameworks governing ESG (Environmental, Social, Governance) practices. This thesis examines the impact of ESG scores on the value of European Firms, shedding light on how these considerations influence the investment decisions before and during the Covid-19 crisis. This study analyzes panel data of 1223 non-financial European firms with a duration of twelve years from 2011 until 2022. It reveals that ESG Score, Environmental Pillar Score and Governance Pillar Score negatively impact the firm value prior to the pandemic, while Social Pillar Score has no significant effect. During the pandemic, only firms investing in Environment have a positive impact on firm value. Additionally, Covid-19 negatively affects firm value when companies invest in Environmental Pillar Score. These findings act as a guide for investors to make a well-informed decision about the allocation of funds and highlight the relationship between the firm value and ESG Score.

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Β Ε Β Α Ι Ω Σ Η

Βεβαιουται οτι η μεταπτυχιακη φοιτητρια Ιωαννα Χριστοδουλου ολοκληρωσε με επιτυχια την προφορικη υποστηριξη της διπλωματικης της μελετης σε εξεταση που ελαβε χωραν ενωπιον διμελους εξεταστικης επιτροπης, στις 23 Μαϊου 2024. Παρεδωσε την διπλωματικη της μελετη στις 28 Μαιου 2024. Η εξεταστικη επιτροπη,

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Σπύρος Μαρτζούκος	**Στέλιος Μαρκουλής**
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1. Introduction

Nowadays, investments in companies worldwide are experiencing a dramatic increase. With the improvement of technology, investors are able to compare companies based on Firm Value, as they can identify and analyze investment opportunities presented to them through Price to Book Value. A complex interaction of micro-level data exists beneath the surface of this commonly used indicator, shaping and influencing its course. Thus, in this analysis the degree of influence of microeconomic factors on the index will be studied.

The appropriate environment for this thesis is the European Continent for several reasons. European Continent includes several countries with different economic structures and industries. Also, the presence of emerging as well as developed economies makes this continent ideal for study. The regulatory framework is extremely good in Europe because it has a well-established and integrated environment. Examining the impact of microeconomic factors on Firm Value in this regulatory context provides insights into how compliance, reporting standards and governance practices affect market values. Countries that are in Europe are well known for implementing important economic policies and initiatives that affect businesses and markets. Analyzing the impact of microeconomic data on Firm Value in Europe provides valuable insights into how policy changes affect investor sentiment. Worldwide, numerous investors are strongly interested in the European market, and understanding the effect of microeconomic data on Firm Value is very important to have a clear picture of the reasons that investment decisions are made.

The idea of environmental, social, and governance was initially proposed by the United Nations Global Compact in June 2004. Its goal is to highlight the significance of these three factors in financial analysis. The idea is helpful in drawing investors' and financial analysts' attention to financial reporting guidelines concerning the interplay between ESG concerns. Sustainability practices are defined and measured using the ESG framework. Businesses use ESG principles to show that they are transparent, which inspires trust in investors and the public regarding their effects on the environment and society. Implementing ESG improves a company's reputation, opens access to funding sources, improves business networks, and enhances consumer loyalty.

The aim of this study is to identify which of the microeconomic determinants that are tested affects the Firm Value and to examine whether the investments in ESG lead to an increasing firm value. Also, it would be tested if the ESG score has the same impact as each pillar separately or has an opposite influence on Firm Value.

The interesting focus of this study is the external factor, the pandemic of Covid-19. The pandemic impacts global economies causing a lot of recessions, numerous firms shut

down and many people lost their jobs. A way that governments tried to curb the dramatic spread of Covid-19, was by implementing lockdowns where the companies faced a lot of economic problems. Including the pandemic in the thesis may provide unexpected results.

2. Literature Review

The value of a company is affected by various factors, with some applying a greater impact than others. According to the literature review several authors found opposite results, even no effect.

2.1 ESG Score and Firm Value

Sustainability advocacy becoming increasingly popular is the fact that it is highly developed in almost every country across the globe. Environmental Social and Governance (ESG) is a term that refers to the triple bottom line of business accountability which holds organizations responsible for their social, environmental, and economic impacts. The origin of the ESG is attributed to the UN that postulated the concept in a corporate social, environmental and a governance context (Jeanice & Sung Suk Kim,2023).

ESG Disclosure Committees oversee determining if the practices related to the elements in their disclosures align with the goals and expectations of the stakeholders.

Many researchers report a positive relationship between ESG Score and Firm Value. Bohyun Yoon, Jeong Hwan Lee, and Ryan Byun (2018) in their own research found a positive and statistically significant link between the two variables. Mahmut Aydogmus, Guzhan Gulay and Korkmaz Ergun (2022) review the impact of ESG performance on firm value and profitability and find that firms with higher ESG Score tend to create more value in the market. In non-crisis times, companies with good ESG implementation will be able to influence the company's stock price and investment. Similarly, the study by Jeanice and Sung Suk Kim (2023), that explores the effects of Environmental, Social, and Governance (ESG) factors before and during Covid-19 pandemic on the performance of companies in Indonesia, is revealed through their study on PBV and ROE rates of the regression line. It gives an insight into the importance of ESG matters for Indonesian companies to be considered in both normal and crisis times. The results propose that companies with highly effective ESG generally affect stock prices and enhance resilience alike, irrespective of the current economic situation.

Contrary to previous studies, Al Dimas Saputra, Eddy Suranta, and Lisa Martiah Nila Puspita (2024) and Caleb Shephard (2022) focus on the impact of ESG on firm value and they support a statistically significant negative link between positive stock market success and ESG performance. Some possible explanations of the

negative impact would be the upfront expenditure for ESG projects (Al Dimas Saputra, Eddy Suranta, and Lisa Martiah Nila Puspita,2024). Investors haven't yet taken ESG disclosure into account when making investment decisions. ESG disclosure lowers the firm's value because investors don't respond well to the signals that were provided as they believe that actions that are listed in the ESG report are excessively costly. As a result, they are less interested in investing to firms (Ayu Sarah Sulistyawati and Dwi Ratmono, 2023).

2.2 Environmental Pillar Score and Firm Value

A tool for evaluating a business's sustainability and environmental achievements is called the Environmental Pillar Score. It assesses many facets of an organization's environmental policies. Environmental Pillar Score is calculated by measuring gas emissions, energy efficiency, recycling practices, assessment of any potential damage to biodiversity, efforts to develop and implement environmentally innovative practices or technologies.

Mahmut Aydogmus, Guzhan Gulay, and Korkmaz Ergun (2022) study the thesis "Impact of ESG performance on firm value and profitability" and investigate that Environmental Pillar Score has no relationship with firm value. One factor that may account for such a low relevance of a company's environmental actions to its value is the time-lag in realizing results, since, often, the projects are no less than a year. Aspiring environmental solutions typically demand huge amounts of investment into operations which seem less appealing compared to quicker and cheaper ways of achieving progress in governance and social score. Furthermore, Thalia Angela, and Nuraini Sari (2023) examine the link between the effect of environmental, social, and governance disclosure on firm value and they found that investments on the environment have no effect on price to book value. Theoretically, this finding is consistent with stakeholder theory, which holds that one of the possible explanations for the lack of a link between firm value and the environment is that environmental actions have a slower payoff period for the company than social or governance-related actions. In fact, it may take years for certain environmental initiatives to be finished before the outcomes influence the value of the company. Environmental procedures need significant financial outlays in a short amount of time.

In contrast to existing researchers, 200 companies listed on the Australian Securities Exchange ASX200, investments of Technology and Healthcare companies in Environmental Pillar shows that there is a negative impact on Price to Book Value (Caleb Shephard, 2022).

2.3 Social Pillar Score and Firm Value

The Social Pillar Score plays a crucial responsibility in assessing a company's commitment to social responsibility and ethical business practices. It is focused on how a company approaches the societal issues involving interactions among its customers, staff, suppliers, community, and other business entities. There are also a number of factors, such as diversity, labor conditions, health and safety protocols, honoring of human rights, and product safety and quality, which are rated to shortlist companies and businesses.

The link between social pillar score and company value varies across numerous studies, with some recognizing that there is a positive relationship between the two variables, while others identify a negative correlation. Specifically, Bohyun Yoon, Jeong Hwan Lee, and Ryan Byun (2018) observe in their study that investors positively value Corporate Social Responsibility (CSR) practices carried out by korean firms. Examining the brazilian firms, they found that there is a positive valuation effect of CSR in the environmentally sensitive industries. Moreover, Mahmut Aydogmus, Guzhan Gulay and Korkmaz Ergun (2022) predicted, based on 1720 listed companies from Bloomberg database, that the social pillar score has a positive impact on firm valuation.

In contrast to previous studies, a study by Caleb Shephard (2022) attempted to measure the impact of ESG in the Australian equity market. Australian firms were examined that are listed on the ASX200 and a negative relationship of social pillar score and firm value was observed.

Thalia Angela, and Nuraini Sari (2023) focus on "The Effect of Environmental, Social, and Governance Disclosure on Firm Value". Their study reveals that while social disclosure has a positive effect on firm value, it is not statistically significant. As a result, social disclosure doesn't have a significant effect on firm value.

2.4 Governance Pillar Score and Firm Value

The Governance Pillar Score is crucial for firms as it's an essential sign for their commitment to moral leadership, transparency, and accountability. The Governance Pillar Score is calculated by assessing several important aspects of board composition, executive remuneration, transparency, shareholder rights, anti-corruption measures.

The effect of good Governance practices may have on business value is however an empirical question. Numerous studies have examined whether there is a potential correlation between Governance Pillar Score and firm value.

Companies in Venezuela improve in corporate governance as a result there is a reduction on their cost of capital and increase on their market valuation. Investors are more willing to invest in companies where they have lower costs when they are more certain that there will be less possibilities for controlling

owners to take advantage of the company's cash flows (Urbi Garay and Maximiliano González, 2008). Alexandre di Miceli da Silveira and Lucas Ayres B. de C. Barros (2007) examined the corporate governance quality and firm value in Brazil. The authors found that there is a strong positive statistically significant relationship between firm value and corporate governance. Specifically, as much as the firms invest in corporate governance, the firm value has an increasing trend and investors are more willing to invest in companies. Rolens E.H. Riwu Manu, Taher Alhabsji, Sri Mangesti Rahayu and Nila Firdausi Nuzula (2019) studied the effect of corporate governance on profitability, capital structure and corporate value. The authors indicate a positive and statistically significant relationship between corporate governance and firm value. Strong corporate governance procedures support the upkeep of an ideal capital structure, which raises organizational value and profitability, according to the study's findings. Moreover, corporate management may use these characteristics as predictive tools to project the corporation's future performance and direction. Research by Siti Miftahul Jannah and Farahiyah Sartika (2022), Eva Safina Rose, Siti Arbainah, Suko Raharjo and Ardian Widiarto (2021), Mahmut Aydogmus, Guzhan Gulay and Korkmaz Ergun (2022), Thalia Angela and Nuraini Sari (2023) found that there is a positive link between company value and corporate governance.

On the other hand, Georgeta Vintilă and Ștefan Cristian Gherghina (2012) studied the thesis "An Empirical Examination of the Relationship between Corporate Governance Ratings and Listed Companies' Performance", and they observed opposite results compared to previous studies. Specifically, the findings of their study indicate a negative and statistically significant relationship between corporate governance and firm value. Moreover, in the study "ESG Pricing in the Australian Equity Market: An Empirical Analysis" (2022), Caleb identified that the impact of Corporate Governance aligns with the findings of Georgeta Vintilă and Ștefan Cristian Gherghina (2012).

2.5 Return on Equity (ROE) and Firm Value

The term Return on Equity (ROE) refers to a financial ratio that shows the ability of a firm to generate profit relative to its shareholder's equity. Investors usually use this financial ratio to assess if a firm is generating profits.

Jajang Romansyah, Mochamad Zakaria and Maria Lusiana Yulianti on their study "The Effect of Profitability (ROE), Capital Structure (DER) and Firm Size on Firm Value (PBV) (Case Study on Primary Consumer Goods Manufacturing Companies Listed on the Indonesia Stock Exchange 2016-2018 Period)" (2021), found a positive relationship between return on equity and price to book value. This result aligns with the research of Syintia Bahraini, Endri Endri, Sugeng Santoso, Leni Hartati, Sri Marti Pramudena (2021). When profitability (ROE) falls,

the firm value (PBV) will decrease, whereas if there is an increase in profitability (ROE) it will increase the firm value (PBV). Increased profitability boosts a business's performance and prospects for the future, attracting investors (Jajang Romansyah, Mochamad Zakaria and Maria Lusiana Yulianti ,2021). Furthermore, Arda Raditya Tantra, Dewi Ari Ani and Fitri Dwi Jayanti (2024) identified a partial effect of return on equity on price to book value.

On the other hand, an analysis of the impact of profitability as proxied by ROE on firm value, showed that there is no impact between the two variables. (Jajat Sudrajat and Hari Setiyawati, 2021).

2.6 Leverage Ratio and Firm Value

Leverage is the ratio of a company's debt to its capital structure and is a useful tool that investors may use for several reasons. Specifically, they may be used to diversify their portfolio, control risk or to increase their returns. It's crucial to comprehend the advantages and disadvantages to make the right decisions on their choices based on their investing goals and risk tolerance.

Many authors studied the impact of Leverage on Firm Value. Syintia Bahraini, Endri Endri, Sugeng Santoso, Leni Hartati And Sri Marti Pramudena (2021) on their study "Determinants of Firm Value: A Case Study of the Food and Beverage Sector of Indonesia" showed that an increase in corporate debt can increase company profits and value. When using debt to finance firm assets, it's important to use them as effectively as possible to save operating expenses. Furthermore, Humera Asad Ullah Khan and Rachmad Hidayat (2022) on their research obtained a positive and statistically significant impact of leverage ratio on firm value. An additional debt made by the company to expand its business will increase the stock price of the company (Akhmadi, Wawan Ichwanudin and Uyun, 2021). The results are in line with Agus Faisal and Izzun Khoirun Nissa (2018), Henviani and Riki Sanjaya (2020).

Oki Ragil Wardana and Tri Gunarsih (2021) in their study "The Effect of Capital Structure on Company Value with Corporate Governance as A Moderating Variable" identified that leverage is not statistically significant, which means that it is not a good explanation of firm value. The same result was also observed by Iman Supriadi (2019), Silvia Mutiara Prihanta, Ira Hapsari, Suryo Budi Santoso and Hardiyanto Wibowo (2023), Ai Hendrani and Dihin Septyanto (2021), Fadjar O.P. Siahaan (2014), Urbi Garay and Maximiliano González (2008), Surya Sanjaya (2023). Information and knowledge management may not be enough to sway shareholders' decisions to raise the company's value in situations when there is a significant amount of debt. As a result, it is not a good idea for a business to run entirely on debt financing because this increases the likelihood of bankruptcy (Fitri Indriawati, 2018). Investors prioritize learning how the firm's management

uses this money as company capital to produce additional value for company value about information on capital structure, which is not visible to them at all. This supports the idea advanced by Modigliani and Miller, according to which the amount of debt a firm utilizes has little impact on its stock price or overall worth since investors are more interested in the profits the company makes or the profitability ratio (Ni Luh Kadek Sanitri, Ni Luh Gde Novitasari, and Ni Luh Putu Widhiastuti, 2020).

2.7 Cost of Equity and Firm Value

Another important determinant of firm value is the cost of equity. It is the return that an investor requires for holding a firm's stock. Cost of equity is calculated by the Capital Asset Pricing Model (CAPM). It means that the expected return on security equals to risk free plus beta times the market risk premium. Investors may make better-informed and more logical judgments about their investments by using the CAPM in their decision-making process.

Anna Sumaryati and Nila Tristiarini (2017) focused on "The Influence of Cost of Equity on Financial Distress and Firm Value" and they found a positive and statistically significant relationship between cost of equity and firm value.

On the contrary, Augustina Kurniasih, Muhamad Rustam, Heliantono and Endri Endri (2022), identified that cost of equity negatively affects the firm value. As the cost of equity increases, the firm's value drops. Additionally, Diana Frederica (2019) agrees with the previous study, as in her research she identified that this inverse association suggests that lower business values are linked to greater equity costs, because of weaker investor appeal or more perceived risk.

2.8 Asset Turnover Ratio (TOTA) and Firm Value

Asset turnover offers information on how well a business converts its assets into revenue and how efficient its operations are. It is a crucial indicator of the business's overall profitability, competitiveness, and financial health. If there is a high asset turnover ratio, means that firm effectively uses its assets to generate sales and the profit will be greater. However, a low asset turnover ratio means that a company doesn't utilize its assets effectively to create sales.

Sakina Ichsani , Adinda Izlia Nurhalshaeni Zaenudin and Gita Novia Damayanti (2021) on their research "The Effect of Financial Ratio on Firm Value: Empirical Evidence from Listed Firms in the IDX30 Index" recognize a positive and significant effect of asset turnover ratio on firm value. Investors use asset turnover ratio as a measure to predict stock return (M. Noor Salim and Andreas Prasetia, 2022).

Not only a positive link between the two variables was observed, but also negative as well. Syintia Bahraini, Endri Endri, Sugeng Santoso, Leni Hartati and

Sri Marti Pramudena (2021) observed in their study "Determinants of Firm Value: A Case Study of the Food and Beverage Sector of Indonesia" that asset turnover ratio has a negative and statistically significant impact on firm value. The results are in line with Fredella Colline who indicates that if a firm sells assets, then the firm will have larger inflow, hence the debt will be reduced. Also, if the firm buys assets, the company needs funds that are provided by debt.

In contrary, some authors found different findings from the previous studies. Isnartik Bama, Azhar Maksum and Abdhy Aulia Adnans (2021) identified that asset turnover ratio has a positive but insignificant effect on firm value. Furthermore, Aisyah Tharridha and Nurul Huda (2023) found that there is no effect of asset turnover ratio on firm value.

3 Data and Methodology

Using panel data collected by DataStream, a sample of 1223 non-financial firms with activities across the European continent will be investigated from 2011 to 2022. Firms are located across 25 European countries and islands. Specifically, firms originate from Germany, Italy, France, Switzerland, Netherlands, Finland, Denmark, Belgium, Austria, Sweden, Norway, Spain, Luxemburg, Greece, Cyprus, Portugal, Poland, Ireland, Israel, Romania, Hungary, Iceland, Malta, Slovenia and Czech Republic.

The research examined how these associations have been affected by Covid-19. The pandemic of Covid-19 has been plaguing countries for the past 5 years. Its arrival in Europe in 2020 (Klelia Avatagelou, 2020) has created several challenges for firms. While lockdowns took place (Lauren Chadwick,2020) several firms were forced to shut down because they could not comply with government regulations, and they were unable to pay their obligations. Therefore, it's extremely important to understand and is of significant interest in comprehending how ESG Score, and each pillar affects the Firm Value during the pandemic.

The dependent variable of the study is the firm value. The company value measurement is proxied by Price to Book Value (P/B). The ratio is usually used to illustrate the company value and investors use it to make decisions about an investment. Price to Book Value (P/B) ratio is a financial metric used to compare a company's market value to its book value. A P/B ratio below 1 suggests that the stock may be undervalued relative to its book value, suggesting that the value of the company's assets as shown on the balance sheet is being underpaid by investors. A P/B ratio above 1 may indicate that the stock is overvalued, indicating that investors are paying more for the firm's assets than they are worth on financial statements.

The variable that has the greatest effect on the price to book value is none other than the return on equity (ROE). It is a financial metric that measures the profitability of a company relative to its equity. A higher ROE indicates that the firms

are more efficient at converting their equity into income. This means that can utilize their shareholders' equity efficiently to generate profit. This efficiency reflects a signal that firms have a strong management performance. Investors, by noticing the high return on equity, are motivated to buy the share of a company, while they will expect higher returns due to strong profitability, better dividend prospects due to the increase of net income.

Since return on equity is the main variable affecting the value of companies, the Du Pont framework will be conducted to gain a better understanding of the areas of strength and weakness in the financial structure of a business.

The DuPont analysis framework was invented by the DuPont Corporation, specifically by F. Donaldson Brown in the 1920s. Brown, developed this approach to break down return on equity (ROE) into more details to enhance comprehension and analysis of the business's financial performance. Return on equity (ROE) is driven by three major financial metrics. Net profit Margin, Asset Turnover and Leverage ratio.

The independent variables of the study are twelve. The most important independent variables are the ESG Score, Environmental Pillar Score, Social Pillar Score and Governance Pillar Score. The ESG variables are incorporated into the study as weighted mean scores. Its environmental performance among businesses considering energy efficiency, recycling processes and gas emissions, among other indicators. The social pillar score examines diversity, working conditions and health and safety protocols to assess corporate social responsibility and social inclusion. The governance pillar score assesses the effectiveness and transparency of a company's corporate governance processes, which include executive compensation, board composition and anti-corruption initiatives. The ESG Score is the summarize of the three pillars.

Furthermore, this thesis will test the impact of some financial metrics. Beginning with the variable which has the greatest effect, Return on Equity, the analysis will examine the factors affecting the ROE based on DuPont Analysis and lastly the Cost of Equity. In more detailed,

1) **Return on Assets (ROE)** shows the ability of a firm to generate profit relative to its shareholders' equity. It indicates how effectively a company uses the money invested by shareholders to generate profits. It is calculated by:

$$\boldsymbol{ROE = \frac{Net\ Income}{Shareholders' Equity} * 100}$$

2) **Leverage** It's the ratio of a company's debt to its capital structure.

$$\boldsymbol{Leverage = \frac{Debt}{Debt + Equity} * 100}$$

3) **Asset Turnover** shows the efficiency of a company in using its assets to generate revenues.

$$\boldsymbol{Asset\ Turnover} = \frac{\boldsymbol{Total\ Revenues}}{\boldsymbol{Total\ Assets}}$$

4) **Operating Profit Margin** indicates the percentage of revenue a company retains as operating profit after covering its operating expenses.

$$\boldsymbol{Operating\ Profit\ Margin} = \frac{\boldsymbol{Operating\ profit}}{\boldsymbol{Revenues}} * \mathbf{100}$$

5) **Cost of Equity** is the return that an investor requires for holding a firm's stock. The Cost of Equity is proxied by CAPM.

$$\textbf{Expected return=}\ \boldsymbol{r_f + b(R_M - r_f)}$$

Additionally, Covid -19 impact is included in the analysis**.** The pandemic started on November 2019, but the first coronavirus case came in Europe on the early January of 2020. It is a variable that brings the value equal to 0 for the years 2011 until 2019, and it brings the value equal to 1 for the years 2020, 2021 and 2022.

Furthermore, the last variable that included in the thesis is a cross-product variable. The binary variable COVID-19 is multiplied by each ESG pillar score and ESG Score to create the cross-product variable. The purpose of this strategic approach is to pinpoint the exact impact of each pillar and the overall impact of the ESG Score on firm value during the COVID-19 pandemic. The study deepens the understanding of how different ESG pillars may have different effects on firm value during times of economic recession, such as the COVID-19 crisis, by adding these interaction terms.

On this thesis, four models are examined for each pillar and ESG Score to fully comprehend the dynamics at work.

1. **Model 1**: This model examines the impact of the determinants of ROE on PBV, along with the specific pillar under investigation.
2. **Model 2**: In this model, the independent variables are ROE and the respective pillar.
3. **Model 3**: This model includes the variables from the first model, with the addition of a variable representing the impact of the COVID-19 pandemic and includes the interaction term of the COVID- 19 pandemic and the pilar.

4. **Model 4**: Building on Model 2, this model further includes the pandemic of COVID – 19 and the interaction term between the COVID-19 variable and the pillar to capture any synergistic effects.

Models that have been tested for **ESG Score**:

- Price to Book Value = β0 + β1 ROE + β2 ESG Score + ε
- Price to Book Value= β0+ β1 Leverage Ratio+β2 Asset Turnover Ratio+ β3 Cost of Equity +β4 Operating Profit Margin +β5 ESG Score+ ε
- Price to Book Value = β0 + β1 ROE + β2 ESG Score + β3 Covid + β4 Covid*ESG Score + ε
- Price to Book Value= β0+ β1 Leverage Ratio+β2 Asset Turnover Ratio+ β3 Cost of Equity +β4 Operating Profit Margin +β5 ESG Score+β6 Covid + β7 Covid * ESG Score + ε

Models that have been tested for **Environmental Pillar Score**:

- Price to Book Value = β0 + β1 ROE + β2 Environmental Pillar Score + ε
- Price to Book Value= β0+ β1 Leverage Ratio+β2 Asset Turnover Ratio+ β3 Cost of Equity +β4 Operating Profit Margin +β5 Environmental Pillar Score+ ε
- Price to Book Value = β0 + β1 ROE + β2 Environmental Score + β3 Covid + β4 Covid*Environmental Pillar Score + ε
- Price to Book Value= β0+ β1 Leverage Ratio+β2 Asset Turnover Ratio+ β3 Cost of Equity +β4 Operating Profit Margin +β5 Environmental Pillar Score+β6 Covid + β7 Covid * Environmental Pillar Score + ε

Models that have been tested for **Social Pillar Score**:

- Price to Book Value = β0 + β1 ROE + β2 Social Pillar Score + ε
- Price to Book Value= β0+ β1 Leverage Ratio+β2 Asset Turnover Ratio+ β3 Cost of Equity +β4 Operating Profit Margin +β5 Social Pillar Score+ ε
- Price to Book Value = β0 + β1 ROE + β2 Social Pillar Score + β3 Covid + β4 Covid*Social Pillar Score + ε

- Price to Book Value= β0+ β1 Leverage Ratio+β2 Asset Turnover Ratio+ β3 Cost of Equity +β4 Operating Profit Margin +β5 Social Pillar Score+β6 Covid + β7 Covid * Social Pillar Score + ε

Models that have been tested for **Governance Pillar Score**:

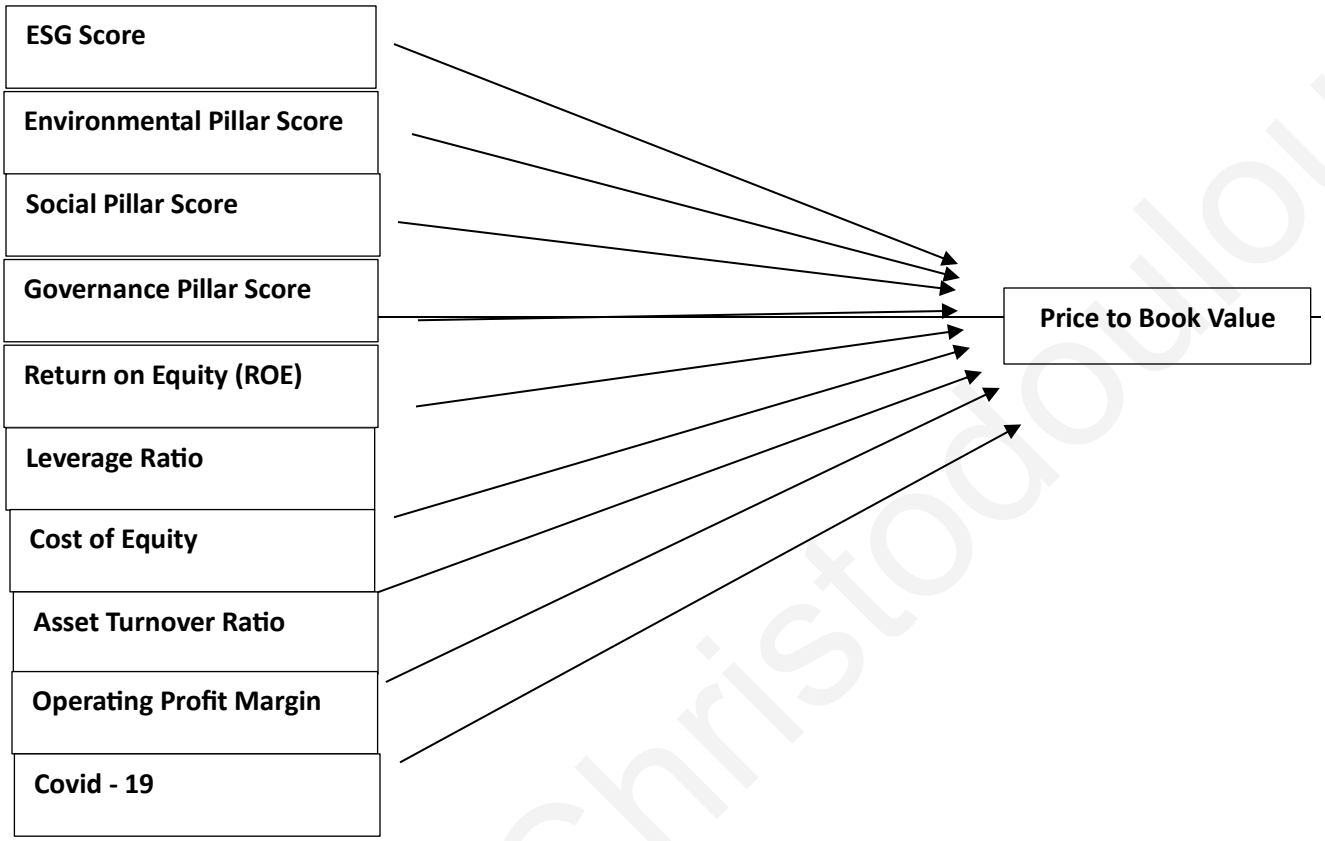
- Price to Book Value = β0 + β1 ROE + β2 Governance Pillar Score + ε
- Price to Book Value= β0+ β1 Leverage Ratio+β2 Asset Turnover Ratio+ β3 Cost of Equity +β4 Operating Profit Margin +β5 Governance Pillar Score+ ε
- Price to Book Value = β0 + β1 ROE + β2 Governance Pillar Score + β3 Covid + β4 Covid*Governance Pillar Score + ε
- Price to Book Value= β0+ β1 Leverage Ratio+β2 Asset Turnover Ratio+ β3 Cost of Equity +β4 Operating Profit Margin +β5 Governance Pillar Score+β6 Covid + β7 Covid * Governance Pillar Score + ε

The analysis is done by Stata, which is a statistical software package that is used to do data analysis, sorting, and visualization. It allows the user to gain access to a wide variety of statistical tools and techniques for the purpose of data analysis and interpretation in the various fields including economics, sociology, political science, public health, among others.

To determine whether fixed effects or random effects models should be used to examine the dataset, a Hausman test is conducted.

Ordinary Least Squares (OLS) regression analysis will be used in the analysis to examine the link between Firm Value and ESG Score, Environmental Pillar Score, Social Pillar Score, Governance Pillar Score, ROE, Cost of Equity, Asset Turnover, Leverage, Operating Profit Margin, Covid-19, the interaction between Covid – 19, ESG score and three pillars.

4. Hypotheses Development



In this research, nine hypotheses are studied based on the pandemic Covid-19 and ESG factors. The hypotheses that are tested are the following.

H1: ESG Score positively affects firm value.
H2: If COVID-19 is included in the model, the ESG Score positively affects firm value.
H3: Environmental Pillar Score positively affects firm value.
H4: If COVID-19 is included in the model, the Environmental Pillar Score positively affects firm value.
H5: Social Pillar Score positively affects firm value.
H6: If COVID-19 is included in the model, the Social Pillar Score positively affects firm value.
H7: Governance Pillar Score positively affects firm value.
H8: If COVID-19 is included in the model, the Governance Pillar Score positively affects firm value.
H9: Covid- 19 negatively impacts the value of companies.

5. Results

5.1 Descriptive Statistics

5.1.1 Number of Firms

Table 2

The dataset used in this thesis comprises 1,223 businesses from 25 European countries. Based on the Table 2, Germany has the highest representation with 215 companies. Sweden, France and Switzerland follow with 215,199 and 153 companies respectively. The bulk of the data comes from these four countries. Other notable contributions are Italy representing 83 firms, Finland with 62 firms and Norway with 55 companies. The lower number of firms come from Cyprus and Israel with 3 firms each, Slovenia with only 2 companies and Czech Republic which represents the lowest number of firms, only 1.

5.1.2 Description of Variables

Table 3

Variables	Observations	Mean	Standard Deviation	Minimum	Maximum
ESG Score	8,513	54.47038	20.72213	0.63	95.74
Environmental Pillar Score	8,512	52.16143	27.20254	0.00	99.01
Social Pillar Score	8,512	58.61119	23.7916	0.12	98.47
Governance Pillar Score	8,513	50.40917	22.76765	0.31	98.56
Price to Book Value	13,817	2.613777	7.810003	-190.92	466.42
ROE	14,258	8.994268	60.26262	-3317.15	1439.03
Operating Profit Margin	14,463	-254.0750	16413.01	-1706811	21569.46
Leverage Ratio	14,501	36.84347	34.38302	-1067.92	1479.31
Asset Turnover	14,529	0.8609619	0.6906985	-0.4190506	32.35433
Cost Of Equity	14,268	0.603317	4.580968	-40.697460	28.769220
Covid	14,676	0.25	0.4330275	0.00	1.00
Covid * ESG Score	8,513	21.99976	29.67436	0.00	95.19
Covid * Social Pillar Score	8,512	23.80698	32.34896	0.00	98.19
Covid * Governance Pillar Score	8,513	20.91504	29.21186	0.00	98.56
Covid * EnvironmentalPillar Score	8,512	20.13716	29.68940	0.00	99.01

A number of significant conclusions regarding the dataset may be drawn from the descriptive statistics shown in the Table 3. Based on the ESG variables, the Social Pillar Score has the highest mean, 58.61, while Governance Pillar Score states the lowest mean, 50.40. The standard deviations show significant variations across the ESG variables, extremely in Environmental Pillar Score which has the widest range from 0.00 to 99.01 in contrast to the other Pillars.

Examining the financial Metrics, the dependent variable, Price to book Value has a mean of 2.61, but there are extreme values as the number range starting from -190.92 to 466.42. The average Return on Equity (ROE) is 8.99, while there is a significant variance across firms as seen by the large deviation of 60.26. Furthermore, ROE ranges from -3317.15 to 1439.03. Additionally, the Operating Profit Margin has an extremely high standard deviation of 16,413.01 and a mean of -254.08. The Operating profit Margin has a range from -1,706,811 to 21,569.46.

The Leverage Ratio has a mean of 36.84 and a standard deviation of 34.38, with values ranging from -1067.92 to 1479.31. The Asset Turnover has a mean of 0.8609 and a standard deviation of 0.6909, with a wide ranging from -40.70to 28.77. The Cost of Equity has a mean of 0.60, with a standard deviation of 4.58, and ranges from -40.70 to 28.77, showing significant variation in the cost of capital for different firms.

About the effect of COVID-19, the binary variable for COVID-19 has the lowest mean of 0.25. With averages ranging from 20.14 to 23.81 and substantial standard deviations, the interaction terms between the COVID-19 and the ESG, Social Pillar,

Governance Pillar, and Environmental Pillar Scores show considerable variety in how the pandemic may have interacted with these scores.

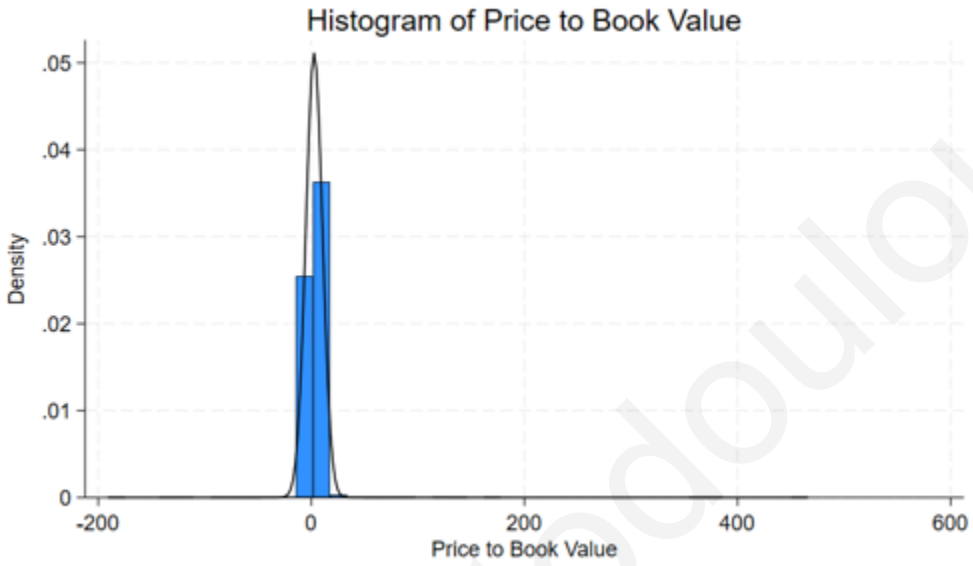
5.1.3 Correlation Matrix

Table 4

Variables	ROE	Leverage Ratio	Asset Turnover	Cost of Equity	Operating Profit Margin	ESG Score	Environmental Pillar Score	Social Pillar Score	Governance Pillar Score	Covid	Covid*Esg Score	Covid * Social Pillar Score	Covid * Governance Pillar Score	Covid * Environmental Pillar Score
ROE	1.0000													
Leverage Ratio	-0.1885	1.0000												
Asset Turnover	0.0651	-0.1595	1.0000											
Cost of Equity	0.0039	0.0062	0.0024	1.0000										
Operating Profit Margin	0.0300	0.0521	0.0423	-0.0122	1.0000									
ESG Score	0.0333	0.1816	-0.0475	-0.0084	0.0562	1.0000								
Environmental Pillar Score	0.0196	0.1971	-0.0524	-0.0577	0.0533	0.8600	1.0000							
Social Pillar Score	0.0438	0.1449	-0.0236	-0.0007	0.0544	0.9038	0.7380	1.0000						
Governance Pillar Score	0.0111	0.1183	-0.0604	0.0332	0.0329	0.7188	0.4294	0.4642	1.0000					
Covid	-0.0155	0.0358	-0.0121	0.4648	-0.0267	-0.0176	-0.0819	-0.0064	0.0365	1.0000				
Covid*Esg Score	-0.0011	0.0897	-0.0376	0.4365	0.0015	0.2647	0.1658	0.2435	0.2468	0.8980	1.0000			
Covid * Social Pillar Score	-0.0008	0.1123	-0.0422	0.4018	0.0101	0.3000	0.2868	0.2647	0.2047	0.8239	0.9569	1.0000		
Covid * Governance Pillar Score	0.0020	0.0868	-0.0323	0.4327	0.0006	0.2472	0.1437	0.2764	0.1824	0.8915	0.9819	0.9309	1.0000	
Covid * Environmental Pillar Score	-0.0068	0.0649	-0.0326	0.4233	-0.0048	0.2253	0.0784	0.1541	0.3517	0.8671	0.9446	0.8498	0.8892	1.0000

Table 4 illustrates information about the correlation between the independent variables. It's a way to test the multicollinearity across the independent variables. Based on the results, in the dataset there is no single variable that is highly correlated with another variable, except the Covid-19 variable with the cross-product variables between Covid-19 and each pillar. This correlation can be explained, as the cross-product variables contain the Covid-19.

5.1.4 Histogram of Price to Book Value



A histogram is a graph that represents the frequency distribution of a dataset. The bars represent the number of observations that fall within a specific range. Histogram is important because it can be understandable if the distribution is normal, bimodal, uniform, or skewed. Furthermore, it gives a picture of the range of data values, which the mean is given by the tallest bar.

Based on the table above, information of the dependent variable is provided. It is a distribution of price to book value which presents a highly right skewed distribution. The most price to book value ratios are closely around zero, with a dramatic peak of values in this range. Density is represented on the y-axis, and it emphasizes the frequency of these by peaking just above 0.05. The x-axis shows a wide range from -200 to 600 but the important data is focused between -50 and 50. The results are logical, as the values of Price to Book Value are closely around 0.

5.2 Hausman Test

Table 5

ESG Score

	fe	re	Difference	Standard Error
ROE	0.0020	0.0020	0.0000	0.0009
Leverage Ratio	0.0686	0.0102	0.0583	0.0088
Asset Turnover Ratio	2.3117	0.7035	1.6081	0.6059
Cost of Equity	0.0527	0.0523	0.0004	0.0024
Operating Profit Margin	0.0001	-0.0001	0.0002	0.0001
ESG Score	-0.0338	-0.0262	-0.0075	0.0099
Covid	-0.6891	-1.6672	0.9781	0.5156
Covid * ESG Score	0.0080	0.0216	-0.0135	0.0068
Prob > Chi2 =	0.0000			

Environmental Pillar Score

	fe	re	Difference	Standard Error
ROE	0.0020	0.0021	-0.0001	0.0009
Leverage Ratio	0.0690	0.0118	0.0571	0.0087
Asset Turnover Ratio	2.2651	0.6891	1.5759	0.6056
Cost of Equity	0.0488	0.0496	-0.0008	0.0023
Operating Profit Margin	0.0001	-0.0001	0.0002	0.0001
Environmental Pillar Scor	-0.0390	-0.0255	-0.0134	0.0078
Covid	-0.7789	-1.3790	0.6001	0.3591
Covid * Environmental Pillar Score	0.0102	0.0164	-0.0061	0.0047
Prob > Chi2 =	0.0000			

Social Pillar Score

	fe	re	Difference	Standard Error
ROE	0.0019	0.0018	0.0000	0.0009
Leverage Ratio	0.0677	0.0083	0.0593	0.0088
Asset Turnover Ratio	2.3851	0.7178	1.6673	0.6060
Cost of Equity	0.0520	0.0539	-0.0018	0.0024
Operating Profit Margin	0.0001	-0.0001	0.0002	0.0001
Social Pillar Score	-0.0055	-0.0079	0.0024	0.0073
Covid	-0.9353	-0.9876	0.0522	0.4740
Covid * Social Pillar Score	0.0070	0.0082	-0.0011	0.0059
Prob > Chi2 =	0.0000			

Governance Pillar Score

	fe	re	Difference	Standard Error
ROE	0.0020	0.0019	0.0001	0.0009
Leverage Ratio	0.0688	0.0094	0.0594	0.0088
Asset Turnover Ratio	2.3453	0.6868	1.6585	0.6056
Cost of Equity	0.0545	0.0544	0.0001	0.0024
Operating Profit Margin	0.0001	-0.0001	0.0002	0.0001
Governance Pillar Score	-0.0243	-0.0243	0.0000	0.0066
Covid	-0.7154	-1.6162	0.9007	0.3659
Covid * Governance Pillar Score	0.0070	0.0225	-0.0150	0.0051
Prob > Chi2 =	0.0000			

A Hausman test is conducted to determine the consistency of an estimator. In panel data, this method is commonly used to differentiate between the fixed effects and random effects. The null hypothesis suggests that the random effect is appropriate. If it is rejected, then the fixed effect is recommended.

Table 5 presents the results of the Hausman Test, across the variables that were tested for each pillar and ESG Score. Based on the results, the p – value is lower than 0.05 leading to the rejection of null hypothesis, which suggests that the random effect model is not the appropriate. As a result, the H1 is accepted, which means that the fixed effect model is the suitable.

5.3 Regression Results

5.3.1 Impact of ESG Score on Price to Book Value without Covid-19.

Table 6

1st model	
Variables	**Price to Book Value**
ROE	0.0006
	0.7150
ESG Score	-0.0294
	0.0040***
Constant	4.4753
	0.0000
Observations	8,376
R-Squared	0.0011
Prob>F	0.0137
Number of years	12
Statistically significant	
***p<0.01	
**p<0.05	
*p<0.1	

2nd model	
Variables	**Price to Book Value**
Leverage Ratio	0.0123
	0.046**
Asset Turnover	1.4680
	0.019**
Cost of Equity	0.0481
	0.031**
Operating Profit Margin	-0.0114
	0.3830
ESG Score	-0.0348
	0.002***
Constant	3.0439
	0.0010
Observations	8,255
R-Squared	0.0009
Prob>F	0.0004
Number of years	12
Statistically significant	
***p<0.01	
**p<0.05	
*p<0.1	

Table 6 illustrates information about the first two models of the impact of ESG Score on Price to Book Value. According to the first model the ESG Score has a negative impact on firm value and it's statistically significant because the p-value which is equal to 0.0040 is lower than 0.01.The 1st hypothesis was rejected. This result was supported by Agency theory which stated that an increase in ESG would appear a negative signal for firm value. Furthermore, this result is in line with Al Dimas Saputra, Eddy Suranta, and Lisa Martiah Nila Puspita (2024) and Caleb Shephard (2022). Return on Equity has no impact on firm value. As shown by R - squared value, Return on Equity and ESG Score explain the 0.11% of the variation in Price to Book Value.

The second model, which is testing the impact of the determinants of ROE, Cost of Equity and ESG Score, finds out that Leverage ratio is statistically significant and has a positive impact on Price to Book Value. If firms want to expand their operations by financing them with debt this means that the growth opportunities of this project are extremely high, which will generate returns higher than the cost of debt. This result agrees with the studies of Syintia Bahraini,

Endri Endri , Sugeng Santoso , Leni Hartati And Sri Marti Pramudena (2021), Humera Asad Ullah Khan and Rachmad Hidayat (2022), Akhmadi, Wawan Ichwanudin and Uyun (2021), Agus Faisal and Izzun Khoirun Nissa (2018), Henviani and Riki Sanjaya (2020). Furthermore, Asset Turnover and Cost of Equity are statistically significant as well and they have a positive impact on Price to Book value. On the contrary, ESG Score is still negatively affecting the Price to Book Value.

5.3.2 Impact of ESG Score on Price to Book Value including Covid-19.

Table 7			
3rd model		**4th model**	
Variables	**Price to Book Value**	**Variables**	**Price to Book Value**
ROE	0.0006	Leverage Ratio	0.0124
	0.7180		0.045**
ESG Score	-0.0306	Asset Turnover	1.4070
	0.009***		0.028**
Covid	-1.1796	Cost of Equity	0.0499
	0.1140		0.037**
Covid * ESG Score	0.0183	Operating Profit Margin	-0.0113
	0.1110		0.3850
Constant	4.6129	ESG Score	-0.0344
	0.0000		0.006***
		Covid	-0.9020
Observations	8,376		0.2520
Prob >F	0.0247	ESG Score * Covid	0.0130
R-Squared	0.0019		0.2800
Number of years	12	Constant	3.1409
			0.0010
Statistically significant			
***p<0.01		Observations	8,255
**p<0.05		R-Squared	0.0011
*p<0.1		Prob>F	0.0012
		Number of years	12
		Statistically significant	
		***p<0.01	
		**p<0.05	
		*p<0.1	

Table 7 shows the results of the impact of ESG Score on Price to Book Value including the Covid-19 in the models. Based on the results of the 3rd model, ESG Score is still negatively affecting firm value before the pandemic. Covid-19 and ROE are not statistically significant, meaning that they have no impact on firm value.

Also, during the pandemic, improving the ESG Score appears to not have a significant impact on Price to Book Value.

According to the 4th model, where examined the impact of control variables on Price to Book Value, ESG Score and the pandemic, it's clear that

Leverage Ratio, Asset Turnover and Cost of Equity have a positive impact on firm value, as all are statistically significant. The ESG Score negatively impacts the firm's value and it's statistically significant, as the p-value is equal to 0.006 which is lower than 0.05. As a result, the 2nd hypothesis was rejected.

Additionally, the Covid-19 and investments to increase the ESG Score during the pandemic don't have any impact on Price to Book Value.

5.3.3 Impact of Environmental Pillar Score on Price to Book Value without Covid-19.

Table 8 1st Model Variables	Price to Book Value	2nd model Variables	Price to Book Value
ROE	0.0005	Leverage Ratio	0.0125
	0.7280		0.0420**
Environmental Pillar Score	-0.0356	Asset Turnover	1.4305
	0.0000***		0.022**
		Cost of Equity	0.0444
Constant	4.7309		0.043**
	0.0000	Operating Profit Margin	-0.0115
			0.3750
Observations	8,375	Environmental Pillar Score	-0.0369
Prob >F	0.0001		0.000***
R-Squared	0.0019	Constant	3.1013
Number of years	12		0.0000
Statistically significant		Observations	8,254
***p<0.01		R-Squared	0.0014
**p<0.05		Prob>F	0.0000
*p<0.1		Number of years	12
		Statistically significant	
		***p<0.01	
		**p<0.05	
		*p<0.1	

Table 8 illustrates data about the impact of Environmental pillar Score and Control Variables on Price to Book Value. The 1st model shows the impact of return on equity and environmental pillar score on price to book value. According to the 1st model it can be concluded that investments that increase the Environmental Pillar Score leads to a decrease in firm value. This result is in line with Caleb Shephard (2022). Return on equity is not statistically significant because the p-value is equal to 0.7280, which is higher than 0.05.

In the second model, only the two determinants of ROE are statistically significant and affect positively price to book value. Conversely, operating profit

margin has no impact on price to book value. Furthermore, cost of equity has a positive influence on firm value. Investors will be more willing to buy a share, knowing that a firm has unique strengths and advantages that allow it to create higher returns in contrast to the cost of capital. Investors will be able to pay a premium to buy a share.

The environmental pillar score has a negative sign which is against the stakeholder theory. Based on the results, the 3rd hypothesis was rejected.

5.3.4 Impact of Environmental Pillar Score on Price to Book Value including Covid-19.

Table 9			
3rd model		**4th model**	
Variables	**Price to Book Value**	**Variables**	**Price to Book Value**
ROE	0.0005	Leverage Ratio	0.1267
	0.7380		0.041**
Environmental Pillar Score	-0.0383	Asset Turnover	1.3712
	0.000***		0.032**
Covid	-1.0744	Cost of Equity	0.0459
	0.050**		0.056*
Covid * Environmental Pillar Score	0.0181	Operating Profit Margin	-0.0114
	0.034**		0.378
Constant	4.9418	Environmental Pillar Score	-0.0380
	0.0000		0.0000***
		Covid	-0.9799
Observations	8,375		0.090*
R-Squared	0.0025	Environmental Pillar Score * Covid	0.0150
Prob>F	0.0002		0.091*
Number of years	12	Constant	3.2915
			0.0000
Statistically significant			
***p<0.01		Observations	8,254
**p<0.05		R-Squared	0.0016
*p<0.1		Prob>F	0.0000
		Number of years	12
		Statistically significant	
		***p<0.01	
		**p<0.05	
		*p<0.1	

Table 9 presents the results of the impact of environmental pillar score on price to book value including the external factor of Covid-19. Regarding the 3rd model, there are very significant and extremely important results. Investments in environmental pillar score prior to the pandemic has a negative impact on firm value. However, during Covid-19, firms charging their money on environmental safety leads to an increase in firm value. This result is in line with the stakeholder theory which says that an increase in ESG conducts to higher firm value. Covid-19 has a negative influence on price to book value. ROE indicates that it does not have

an impact on firm value, which is in line with Jajat Sudrajat and Hari Setiyawati (2021).

As stated in the 4th model, leverage ratio and asset turnover are statistically significant and increase the firm value. Cost of equity has a positive and significant effect on price to book value, with a p-value of 0.056 which is lower than 0.1. The environmental pillar score still has a negative and statistically significant impact on firm value. It has not been proven that operating profit margin, Covid-19 and the cross-product variable have an impact on price to book value.

Based on the results the 4th hypothesis is true if in the model only ROE, Environmental Pillar Score and Covid-19 are included.

5.3.5 Impact of Social Pillar Score on Price to Book Value without Covid-19.

Table 10			
1st Model		**2nd model**	
Variables	**Price to Book Value**	**Variables**	**Price to Book Value**
ROE	0.0005	Leverage Ratio	0.0117
	0.7290		0.058*
Social Pillar Score	-0.0104	Asset Turnover	1.6967
	0.2050		0.007***
Constant	3.4786	Cost of Equity	0.0376
	0.0000		0.090*
		Operating Profit Margin	-0.0121
Observations	8,375		0.3520
Prob >F	0.422	Social Pillar Score	-0.0098
R-Squared	0.0001		0.2700
Number of years	12	Constant	1.5711
			0.0580
Statistically significant			
***p<0.01		Observations	8,254
**p<0.05		R-Squared	0.0004
*p<0.1		Prob>F	0.0165
		Number of years	12
		Statistically significant	
		***p<0.01	
		**p<0.05	
		*p<0.1	

The table above illustrates information about the impact of social pillar score on firm value. Regarding the 1st model, none of the variables has an impact on price to book value. ROE and social pillar score have a huge p-value indicating the lack of association.

The 2nd model shows that only three control variables are statistically significant: leverage ratio, asset turnover and cost of equity have a positive sign,

indicating that if there is an increase in any of the three variables, leads the firm value to an increase.

The 5th hypothesis was rejected because the social pillar score has no impact on firm value and is not statistically significant. This result is in line with Thalia Angela, and Nuraini Sari

5.3.6 Impact of Social Pillar Score on Price to Book Value including Covid-19.

Table 11			
3rd model		**4th model**	
Variables	**Price to Book Value**	**Variables**	**Price to Book Value**
ROE	0.0005	Leverage Ratio	0.0123
	0.7460		0.047**
Social Pillar Score	-0.0077	Asset Turnover	1.4907
	0.3950		0.020**
Covid	-1.1184	Cost of Equity	0.0492
	0.1120		0.040**
Covid * Social Pillar Score	0.0127	Operating Profit Margin	-0.0119
	0.2070		0.3590
Constant	3.4760	Social Pillar Score	-0.0068
	0.0000		0.4800
		Covid	-1.1700
Observations	8,375		0.1140
Prob >F	0.3075	Social Pillar Score * Covid	0.0121
R-Squared	0.0005		0.2510
Number of years	12	Constant	1.7030
			0.0420
Statistically significant			
***p<0.01		Observations	8,254
**p<0.05		R-Squared	0.0006
*p<0.1		Prob>F	0.0161
		Number of years	12
		Statistically significant	
		***p<0.01	
		**p<0.05	
		*p<0.1	

The table above shows the impact of social pillar score on price to book value including the pandemic of Covid-19. Regarding the 3rd model, none of the variables are statistically significant. Social pillar score doesn't have an impact on firm value.

The 4th model shows the influence of control variables, Covid-19, the cross-product variable and the social pillar score on price to book value. Based on the results, leverage ratio, asset turnover and cost of equity have a positive and significant impact on firm value. Investments in social pillar score prior and during the pandemic are not significant.

The 6th hypothesis was rejected, while social pillar score during Covid-19 doesn't have a proof that it has a positive impact. In contrary, it shows that there is no impact.

5.3.7 Impact of Governance Pillar Score on Price to Book Value without Covid-19.

Table 12			
1st model		**2nd model**	
Variables	**Price to Book Value**	**Variables**	**Price to Book Value**
ROE	0.0006	Leverage Ratio	0.0123
	0.6960		0.047**
Governance Pillar Score	-0.0187	Asset Turnover	1.5804
	0.016**		0.011**
Constant	3.8107	Cost of Equity	0.0458
	0.0000		0.039**
		Operating Profit Margin	-0.0109
Observations	8,376		0.4000
Prob >F	0.0517	Governance Pillar Score	-0.0242
R-Squared	0.0015		0.003***
Number of years	12	Constant	2.2802
			0.0020
Statistically significant			
***p<0.01		Observations	8,255
**p<0.05		R-Squared	0.0011
*p<0.1		Prob>F	0.0007
		Number of years	12
		Statistically significant	
		***p<0.01	
		**p<0.05	
		*p<0.1	

Table 12 shows the influence of governance pillar score on firm value without the pandemic. Regarding the 1st model, only governance pillar score has a negative and significant impact on firm value. It has a p-value equal to 0.016 which is lower than 0.05. Improving the governance of a firm frequently tackles a variety of challenges that doesn't ensure success. For example, better corporate governance is fostered by separating the responsibilities of CEO and Chairman, since this improves supervision, responsibility, and strategic focus. However, separation sometimes contributes to problems such as lower flexibility. If a CEO

must take an action immediately but chairman disagrees, then it can create a conflict of interest. They are causing a delay in decision making leading to a decrease in firm value. Also, they may miss a lot of opportunities based on the delay in decision making. The finding aligns with the study of Georgeta Vintilă and Ştefan Cristian Gherghina (2012) and Caleb Stephard (2022).

The 2nd model shows that leverage ratio, asset turnover and cost of equity have a positive impact on firm value. Operating profit margin has no impact on price to book value because it's not statistically significant according to the p-value.

The 7th hypothesis was rejected, as governance pillar score has a negative impact.

5.3.8 Impact of Governance Pillar Score on Price to Book Value including Covid-19

Table 13

3rd model Variables	Price to Book Value	4th model Variables	Price to Book Value
ROE	0.0006	Leverage Ratio	0.0126
	0.7030		0.042**
Governance Pillar Score	-0.0200	Asset Turnover	1.4499
	0.024**		0.023**
Covid	-0.9195	Cost of Equity	0.0523
	0.1210		0.029**
Covid * Governance Pillar Score	0.0135	Operating Profit Margin	-0.0108
	0.1700		0.4050
Constant	3.9691	Governance Pillar Score	-0.0241
	0.0000		0.009***
		Covid	-0.6394
Observations	8,376		0.3100
Prob >F	0.0794	Governance Pillar Score * Covid	0.0077
R-Squared	0.0028		0.4520
Number of years	12	Constant	2.4492
			0.0010
Statistically significant			
***p<0.01		Observations	8,255
**p<0.05		R-Squared	0.0013
*p<0.1		Prob>F	0.0022
		Number of years	12
		Statistically significant	
		***p<0.01	
		**p<0.05	
		*p<0.1	

Table 13 illustrates information about the impact of governance pillar score on firm value taking account the Covid-19. Adding the variable of pandemic, investments in governance pillar score negatively influence the price to book value, as the p-value is less than 0.05. ROE, Covid-19 and the cross-product variable have no impact on firm value.

Based on the 4th model, leverage ratio, asset turnover and cost of equity have a positive influence on firm value. Regardless the impact of Covid-19, governance pillar has a negative impact on firm value.

The 8th hypothesis was rejected, while governance pillar score has the opposite results.

6. Conclusion, Recommendations and Limitations

6.1 Conclusion

This thesis offers a comprehensive analysis of how ESG Scores impacts the value of European companies prior and during the pandemic of Covid-19. The study of 1223 non-financial European companies covering twelve years, starting from 2011 to 2022, offers important results of how ESG considerations impact investment decisions.

Prior to the pandemic of Covid-19, the findings show that firm value was negatively impacted by the overall ESG Score, environmental pillar score and governance pillar score. In contrast, to the Social Pillar Score, no associations were observed.

The main message from these results is that before the pandemic, investors may have believed that investing in strong governance and environmental standards was not considered in the valuation or may they have believed that these improvements would not bring out immediately positive results.

During the pandemic, results show that investments in environmental pillar score leads to a positive impact on firm value. This change highlights the importance of environmental sustainability when firms face crises. Furthermore, Covid-19 negatively impacts firm value, but this effect occurs only when firms invest in environmental safety. One potential reason for the negative impact of pandemic is because of the economic disruptions, uncertainties, and lockdowns.

6.2 Suggestions and Limitations

Future research should focus on how ESG Scores influence firm value across other continents such as United States and Asia. Firms in United States face a wide range of challenges, due to climate change such as floods and especially tornadoes. In that continent the results would be more interesting because firms may invest much more in environmental safety. Also, in United States would be interesting if some crises were taken into account such as Covid-19 or the global financial crisis. The same research can take place in Asia where countries may have different regulatory frameworks and priorities according to ESG. Comparing the results of the three continents would be

interesting in understanding how each continent promotes and prioritizes the ESG. Furthermore, doing a cross – continental comparison would offer deeper insights on how ESG factors influence the investment decisions.

Some limitations of this study include the fact that the focus in only on firms that are located in Europe, as well as the fact that 1223 firms are included, which are not categorized based on their operation. Additionally, the selection of firms was not conducted equally from each European country.

7. References

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