

Louvain School of Management

Assessment of ESG ratings on companies' financial performances in Europe across different sectors.

A comprehensive approach providing an assessment of the current European ESG-landscape, a qualitative and a quantitative analysis.

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Academic year 2022 - 2023

Daytime schedule:

Master Subject and focus: Finance

Abstract:

This master thesis aims to assess the impact of ESG ratings on companies' financial performances in Europe in different sectors. This study is carried out as the ESG landscape is evolving at an exponential pace over the past few years and aims to address the literature gap of the subject. For this purpose, the thesis is composed of a literature review, an assessment of the fast-evolving ESG landscape, a qualitative analysis to grasp businesses perspectives on the topic and a quantitative analysis based on a one-time period to test hypotheses on a Bloomberg dataset for different sectors.

Europe, who is a global leader for the ESG market development and hold 84% of global sustainable assets, recently introduced new stricter regulation (i.e.: the CSRD) to modernise the current NFRD. Our qualitative analysis shows that companies could not find any relationship between ESG matters and financial performances up to date. Nevertheless, these companies expect this relationship to become significant and bigger in the future. Our quantitative analysis, based on about 400 selected securities, shows as well that our Bloomberg dataset does not support the idea that there is a relationship between ESG ratings and companies' financial performances.

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Foreword

It is with excitement that we present results from this master thesis about “The impact of ESG ratings on companies’ financial performances in Europe in different sector”. The motivation behind this research question arises from the desire to conduct a comprehensive assessment of the fast-evolving ESG landscape within Europe who is leading the ESG market development. The world is currently marked by intensified initiatives to mitigate the climate change, by ever-improving technological advancements and by the desire to foster socially inclusivity.

We would like to express our sincere gratitude to the UCLouvain for granting access to Bloomberg Terminals to its students. Bloomberg was definitely an unavoidable resource for the realisation of the thesis and enabled to deal with highly accurate data and financial news. In addition, we would like to thank all respondent of the qualitative analysis who provided invaluable insights for the analysis thanks to their high level of responsibility in their respective company. At last, but not least, we would like to thank our thesis supervisor Frederic Pouchain, guest lecturer at the LSM and CEO of Whitestone Group, for his precious guidance, insights and constructive feedback. It has been a pleasure to work with these 2 key words as a “North Star”: Liberty and Proactivity.

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Executive Summary

The thesis is composed of 4 main parts, namely: the introduction, the literature review, the qualitative analysis and the quantitative analysis.

The introduction provides a presentation of the topic, motivations behind it, the global methodology followed and the significance for the literature. The presentation of the subject basically consists of a comprehensive assessment of the current European ESG landscape by covering notably its origins, evolutions, purpose, utility, related regulation and initiatives.

The literature review presents a summary of many academic peer-reviewed papers and public reports written on the topic. It will enable the reader to understand what analysis were conducted in the past and what gap this research aims to fill.

Both the qualitative and quantitative analysis follow a similar structure starting with an introduction to present the objectives and a methodology section to explain thoroughly what steps are followed. Furthermore, the analysis shows the results obtained, a comparison of these with the literature review, the limitations associated with the specific analysis and a conclusion.

The qualitative analysis focuses on delivering an analysis of businesses perspective on the subject through a study conducted on large Belgian listed companies, notably from the BEL20, via an online survey.

Finally, the quantitative analysis presents results of the empirical study performed on a Bloomberg dataset. This last section enables us to test hypothesis for answering the main thesis question using our own data and statistical models.

Introduction

This section is an introduction to the thesis and is composed of the presentation of the topic, the motivation behind it, the methodology and finally the significance of the study for the literature.

Presentation

This section presents the topic and basically consists of a comprehensive assessment of the current European ESG landscape by covering notably its origins, evolutions, purpose, utility, related regulation and initiatives.

This report aims at assessing the impact of ESG ratings such as the *Bloomberg ESG score* on corporate financial performances in Europe in different sectors.

This master thesis research is conducted in a context where “global sustainable fund assets¹ reached 2.74 trillion USD at the end of March 2023 with Europe representing 84% of these and being by far the most developed and diverse ESG market”. The 2.3 trillion USD assets into sustainable fund in Europe represent “22% of the overall European fund universe” (Morningstar a., 2023). Moreover, Europe set “ambitious goals on environmental, social and governance matters to meet by 2030 and 2050” through notably the “Green deal” or the “EU Taxonomy”. These ambitions are accompanied by new stricter regulations for companies with the CSRD for instance (EC, 2023). Additionally, this thesis is carried out in a context where “global warming is impacting the planet Earth, where inequalities widen and where human rights are unfortunately still not universally guaranteed” (IPCC report, 2023).

The global warming caused by human activities provoked a significant increase in the frequency of extreme weather events like “floods, storms, earthquakes, wildfires, droughts, extreme temperatures” in the world and “have notably reinforced investors’ concerns about unsustainable human activities”. These unconscious human activities represent a threat for humans, the nature and the economy. During the last 20 years, thousands of major disaster events “claimed 1.23 million lives, affected 4.2 billion people and resulted in approximately 3

¹ « The Morningstar “global sustainable fund universe” encompasses open-end funds and ETFs that, by prospectus or other regulatory filings, claim to focus on sustainability; impact; or environmental, social, and governance factors and is based on intentionality rather than holding” (Morningstar, 2023).

trillion USD in global economic losses” with the biodiversity affected for the long term on top. These numbers represent an increase of “30% in the number of people affected and of 90% in economic losses” compared to the period 1980 - 1999 and is mainly explained by the “steep increase in climate-related events”. As a result, an increasing part of individual and institutional investors are “seeking for sustainable investment to put their savings into what they believe is the right thing to do” (Bloomberg ESG certificate, 2022) (UNDRR² report, 2020)

Times when “companies were absolutely unregulated regarding non-financial disclosures seems now definitely outdated” (Bloomberg certificate, 2022). Many controversies, like the “Volkswagen scandal” happened and triggered or accelerated the need for more regulation and transparency about non-financial information.

In this last case, the EPA³ found that most Volkswagen cars in the US had a “cheating software” enabling the car to know when it was being tested to put itself in a mode where the car was running below its full performance. As a result, some VW cars emitted nitrogen oxide up to “40 times above what is allowed in the US” (BBC, 2015). The VW stock plummeted, to “up than 50% following this announcement” (Yahoo finance, 2023). This is a clear evidence of the absolute need for more corporate transparency to avoid such behaviours on the one hand and of the potential impact of climate controversies on the stock market on the other hand.

Traditional valuation methods, such as DCF⁴, might effectively be outdated in order to comprehensively assess risks of an investment and the Equifax⁵ data breach is a great example for it. Equifax publicly announced in “September 2017 a data breach that exposed personal information of more than 150 million people and their stock prices fell by more than 30% as a result” (CNN Business, 2019) (Federal Trade Commission, 2022) (Yahoo Finance, 2023). It is interesting to note that months before, “the *MSCI ESG index* had downgraded Equifax to the worst rating, “CCC”, due to Data Security and Privacy concerns” (Bloomberg ESG certificate, 2022).

² « The UN Office for Disaster Risk Reduction was established in 1999 and serves as the focal point in the United Nations System for the coordination of disaster risk reduction. » UNDRR

³ Environmental Protection Agency

⁴ DCF: Discounted Cash Flow is a traditional valuation method based on the expected future Cash Flows

⁵ Equifax Inc. is an American multinational consumer credit reporting agency

This example shows clearly the need for investors to take a more comprehensive risk assessment approach, in this case, the social risk, if they want to perform better. It is now clear that relying only on traditional valuation methods is outdated as it does not enable investors to assess comprehensively risks in investment decisions process.

Carbon offsets might be a hot topic for the future towards the net zero journey. As a matter of fact, many companies have set the “net zero carbon emission goal for 2050 but 50% of these rely on CO2 offsets” (Bloomberg ESG certificate). Therefore, the basic supply and demand curve might drive offsets prices to surge in the coming years due to a large demand and low supply. The magnitude of this will depend notably on the evolution of the regulation defining what is considered as an offset and what emissions companies are allowed to offset. Depending on these two variables, the price for offsetting a metric ton of CO2 might evolve from 11\$/ton to 224\$/ton in 2030 according to the Bloomberg Intelligence (BloombergNEF, 2022). This uncertainty should be considered very carefully by investors investing in large CO2 emitter as it could impact drastically these companies’ financial health in the future.

The current regulation regarding ESG disclosures is the outcome of a long journey and is expected to evolved still much faster in the coming years with the CSRD⁶ for instance which “strengthens and modernises the rules concerning the social and environmental information companies have to report” (EC, 2023).

The UNEP FI⁷ was a precursor in 1992 into convincing the financial sector to engage with sustainability and eventually gave birth to the PRI⁸. ESG was born in 2004 from “Who Cares Wins”, a joint initiative of 20 large financial institution with more that 6 trillion USD AUM⁹, invited by the former UN Secretary Gen. K. Annan to develop a system that enhance the integration of environmental, social and governance matters into financial services (Who Cares Win, 2004). The UNEP FI disclosed in 2005 a legal framework for the integration of ESG issues into institutional investment. Finally, in 2015, the UN launched “a plan for action

⁶ Corporate Sustainability Reporting Directive

⁷ United Nations Environment Programme Finance Initiative

⁸ PRI: Principles for Responsible Investment: “The PRI is the world’s leading proponent of responsible investment. » (PRI)

⁹ AUM: Asset Under Management

for people, planet and prosperity with the emergence of the 17 UN SDG¹⁰'s in the *Transforming our World: The 2030 agenda for Sustainable Development* initiative” (SDGs, 2015).

Decision makers have a major role to play for the Net Zero Journey as they commit to “Nationally Determined Contributions” during annual conference of parties (i.e.: COP) and have a direct influence on regulators who themselves have a major influence on companies’ sustainable behaviours (COP27, 2022). Every year since 1995 in Berlin where the first COP happened, “decisions makers from all over the world are reunited to engage their countries into the fight against Climate Change” (UNFCCC, 2023). Commitments are now organised around “4 main pillars: Mitigation, Adaptation, Finance and Collaboration” (UNFCCC, 2023).

The “COP21 marked a milestone in this journey as 196 parties agreed to the Paris Agreement” which is a “legally binding international UN treaty under the UNFCCC to limit global warming well below 2°C, preferably to 1.5°C compared to pre-industrial levels” (UNFCCC, 2023). Some key highlights of the COP26 are that “developed countries will deliver the 100 USD billion goal for climate finance by 2023 and that 34 countries and 5 public finance institution will stop financing the fossil fuel sector and finally, private financial institutions are now working with Central Banks to “realign trillions toward global net zero” (COP26, 2021).

Michael R. Bloomberg, chairman of the Task Force on climate-related disclosures (TCFD¹¹, 2022), reveals in the last TCFD annual report that he is both “proud and concerned about the evolution of the situation regarding TCFD-aligned companies report” (TCFD, 2022).

On the one hand, he is “enthusiast about the fact there is an increasing number of companies aligned with the TCFD framework disclosures as 80% of companies disclosed in line with at least one of the 11 recommended disclosures” (TCFD, 2022). In addition, he is enthusiast about “significant actions” taken by regulators and the public sector such as the US Securities and Exchange Commission (SEC), the International Sustainability Standards Board

¹⁰ United Nations Sustainable Development Goals

¹¹ Task Force on Climate-related Disclosures: “TCFD, created by the Financial Stability Board (FSB) is committed to market transparency and develops recommendations on the types of information that companies should disclose to support investors, lenders, and insurance underwriters in appropriately assessing and pricing a specific set of risks—risks related to climate change”. (TCFD, 2023)

(ISSB), and the European Financial Reporting Advisory Group (EFRAG) “to use the TCFD recommendations for climate related disclosures” (TCFD, 2022).

On the other hand, he is also “concerned about the urgent need for more progress in the coming years as there is only 4% of companies disclosing in line with all 11 recommended disclosures and only around 40% disclosing in line with at least five” (TCFD, 2022).

The EU Green Deal also have a major impact on companies as it aims to achieve the ambitious goals of being the “first climate-neutral continent and therefore to decrease by at least 55% net greenhouse gas emissions by 2030”. This “growth strategy” has considerable financial implications in Europe and for instance requires “30% of the EU multiannual budget for 2021 - 2027” to be allocated for green investments by issuing NextGenerationEU green bonds (EU Green Deal, 2019).

Furthermore, the EU Taxonomy is an additional lever that might affect the influence of sustainable activities of a company on its financial performances. The Taxonomy is a “tool for investors and companies to make informed investment decisions on sustainable activities”. The EU Taxonomy brings new obligations such as the need for investors and credit institutions “to disclose the degree of alignment of their portfolio with the EU taxonomy, notably through Green Assets Ratios” (EU Taxonomy, 2020).

However, there is still a lack of regulation on the market to align companies’ disclosures with sustainable objectives though 2030 and 2050 are coming fast. We observe for instance in the energy or automotive sector companies not disclosing their scope 3¹² of GHG¹³ emission nor their carbon intensity though it represents the majority of their emissions.

The purpose of this thesis is to assess whether companies’ financial performances are affected by their ESG rating. Do investors already include these variables into their investment decision-making process? What does the European ESG landscape currently look like? What are the businesses perspectives on the topic? How are ESG ratings structured? How is this relationship expected to evolve in the future? In this paper, we

¹² Scope 3: “It refers to the indirect emission that are a consequence of business activities” (GHG Protocol)

¹³ GHG: Greenhouses gases

will take a deep dive into the implication of non-financial disclosures on companies' financial performances. The answers and key highlights presented in this thesis will enable the reader to gain a deep understanding of the key drivers influencing this relationship as well as of the ESG landscape as a whole.

Motivations

Three main reasons are supporting the choice to elaborate on the topic.

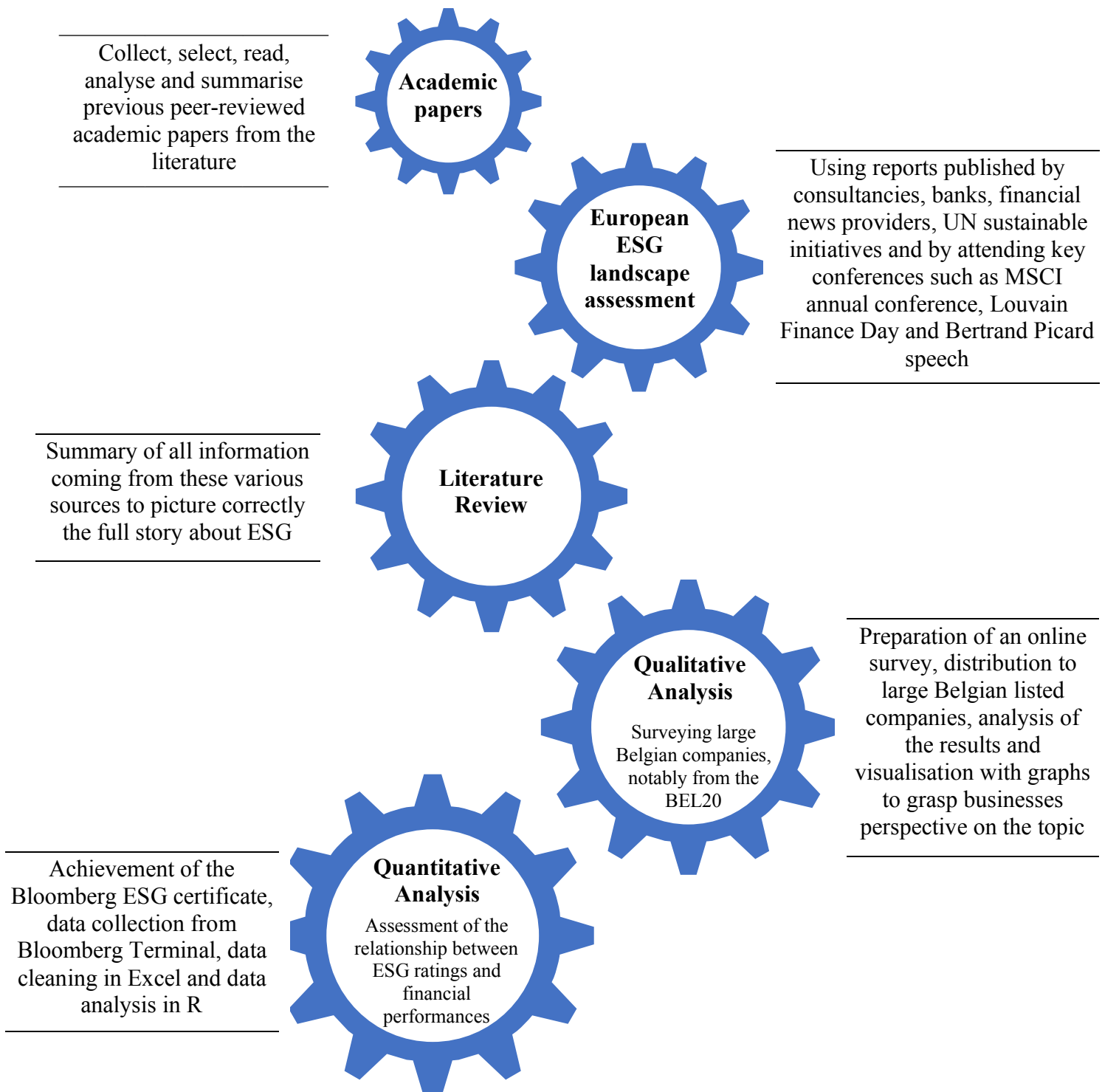
First of all, it is challenging, interesting and topical to work on a topic whose landscape is evolving at such a high pace. Being ESG-aligned went from a “niche” strategy, to mainstream and is finally currently a “must have”. The evolution is driven by the wish of individuals “to invest into the right thing”, wish of investors to assess comprehensively risks of an investment with both financial and non-financial information and finally wish from regulators whose role are to make sure companies disclosures reflect the reality.

Secondly, it is exciting to focus the research on Europe which is currently the leader in terms of ESG market development. European Union have strong carbon neutrality commitments for 2030 and 2050 and consequences for non-complying companies might become tougher over the years for their financial health. Regulations evolve as a result to support these sustainable ambitions and is definitely expected evolve further as there is much room for progress.

Thirdly, it is stimulating to have the ambition to conduct such a comprehensive research composed of a literature review, the assessment of the current ESG landscape, a qualitative and quantitative analysis all aligned toward the same research question.

Methodology

Here is a quick visualisation of the methodology followed for this thesis and a more comprehensive explanation follows afterwards.



This paper follows a rigorous methodology to ensure the quality of its inputs and as a result the quality of its outputs.

The first step is to collect, select, read, analyse and summarise previous academic papers written on the topic in the literature. For this purpose, we start by conducting these steps and analyse around 20 peer-reviewed scientific papers on the subject to understand what knowledge is already available about the relationship ESG factors and the financial performance.

The second step consists of assessing the European ESG landscape in order to understand what happened in the past, what is the current reality and what is expected in the future.

For this reason, we will review reports about sustainable finance published by consultancies such as McKinsey & Co., BCG and Bain & Co., by banks such as JP Morgan Chase & Co., UBS and Goldman Sachs and by financial news provider such as Bloomberg or Morningstar. In addition, we will attend some highly relevant conferences about sustainability such as the Louvain Finance Day¹⁴, the MSCI's Capital for Climate Action conference and the "reconciling ecology, economy and the just transition" conference¹⁵. Finally, we will also analyse reports and articles published by different sustainable initiatives such as by the United Nations Climate Change, Conference of the parties, the Intergovernmental Panel on Climate Change (IPCC), the Task Force on climate-related Disclosures (TCFD), The EU Green Deal, Sustainable Finance Disclosures Regulation (SFDR) and The EU Taxonomy.

The third step consists of summarizing all information coming from these various sources of information in order to picture correctly the full story about ESG. The literature review will then be written based on the cited research's, papers, articles and reports to enable the reader to fully understand the literature's knowledge prior to this paper and to have a clear understanding of the current ESG landscape.

¹⁴ Pathways towards net zero & sustainable investments by Philippe Wallez & Frédéric Degembe – ING, Because and Within by Jean Boissinot – Banque de France

¹⁵ Solar Impulse Foundation

Fourth, a qualitative analysis is conducted and aims to understand how companies use the ESG framework and how they estimate themselves its impact on their financial performances. The scope will be reduced to Belgian listed companies, especially in the BEL20 and will be contacted through the investor's relations contacts and mails. Companies will be asked to answer to an online survey, that you can find in the Appendix A. Results from the analysis will then be used to set hypothesis to be tested on the data of the quantitative analysis. You can find these results in Appendix B.

Fifth, the quantitative analysis of this paper is conducted to assess with our own data and models the relationship between ESG ratings and companies' financial performances. With this goal in mind, we start by completing the "Bloomberg ESG certificate". "The Bloomberg ESG Certificate is a self-paced, interactive e-learning course that shows learners how to implement ESG strategies and prepare ESG reports for regulators through the lens of a fictitious buy-side asset management firm". The achievement of this certification represented a key milestone for this research paper, as it enables to "Describe ESG trends and common ESG investment strategies", "Analyze how asset managers integrate ESG considerations into their investment decision-making process", "Explain how shareholder activism influences corporate behavior", "Practice tasks within various stages of the investment process". (Bloomberg certificate, 2022)

Moreover, different hypotheses are set using a null and an alternative hypothesis. Then, all methods such as regression models used in the empirical part and every variable are comprehensively explained. The data is retrieved from Bloomberg and processed via Excel and "R" for the statistical analysis. Finally, the results will be analysed and further explained based on the data sample, hypothesis, selected variables and different regressions.

Finally, the conclusion of the thesis summarises the existing literature, the assessment of the current ESG landscape and the results of the qualitative and quantitative analysis. You can find all the statistical analysis, models and results in Appendix C.

Significance of the study

This thesis is highly relevant for the literature as it brings a unique approach to a complex and topical question: The impact of ESG ratings on companies' financial performances. The approach, focusing on Europe on different sectors, is considered as unique as it enables the reader to understand what has been written in academic papers in the past, to grasp fully the current fast-evolving ESG landscape, to comprehend businesses' perspectives via the qualitative analysis and finally to observe results of a unique approach in the quantitative analysis.

Literature Review

Old perspectives about ESG

A prestigious American economist, Milton Friedman already discussed in 1970 about the idea of Corporate Social Responsibility (i.e.: CSR). Back in the days, Friedman argued that it was not right to integrate CSR into the business decision-making as the “only social responsibility of business was to increase profits” and he therefore did not find any reason for a company spending any money on social matters (Friedman M., 1970). Other authors argued as well that there was definitely a “trade-off between social considerations and higher stock return” (McWilliams A. & Siegel D., 1997).

McWilliams also advises to look very “critically at reports announcing positive returns on investment in CSR” because these reports were usually conducted by “academicians not consulting any professional expert on the topic” that could approve methods used to show the correlation (McWilliams A. & Siegel D., 1997). On the other hand, some studies showed that enhancing a company social performance would not harm its financial performances (Graves S. B. & Waddock, 1994).

Introduction to the concept of “materiality”

More recently, according to a key research published by the Harvard Business School (i.e.: HBS) in 2016, “companies performing well on material¹⁶ sustainability issues outperform those with poor performances on these” (Khan M., Serafeim G., & Yoon A., 2016). Khan and Serefeim bring a new feature in their research compared to the previous literature by adding the distinction between material or non-material issues in their analysis.

The SASB Standards defines “financial materiality” as sustainability information reasonably likely to affect the financial performance of the typical company in a specific industry. A company in the “coal operations” will effectively not have the same sustainable criteria as a “Internet Media & Services » company (SASB, 2023).

¹⁶ “An ESG issue is considered to be material if it can be reasonably expected to have a financial impact on the company” (Morningstar, 2019).

Impact of materiality

Another HBS study finds how a specific issue “becomes financially material and therefore impacts the company profitability and valuation”. For this purpose, they breakdown the process from being non-material to material in 5 distinct steps. It enables profit-driven companies to understand how to “best allocate their resources using this tool to improve the risk-adjusted return”. It also enables impact-driven companies and investors to implement initiatives creating an incentive for other companies and investors to “align their behaviour with social and environmental outcomes” (Freiberg D., Rogers J., Serafeim G., 2019).

The materiality considerations brought a new layer of quality for ESG ratings as it gives much more weight to issues that really matter depending on industries. The *MSCI ESG* index use the “Materiality Map” developed by the SASB for integrating this financial materiality into their ESG rankings and ratings. Nicolas Madison and Eduardo Schiehl show in their research that it significantly affects both “informative value of ESG rankings and ratings” when considering the financial materiality (Madison N. and Schiehl E., 2021).

Past quantitative analysis

A study published in 2022 shows that a downgrade in the ESG rating leads to a detrimental stock return with a “significant monthly risk-adjusted returns of -1.2% on average” (Shanaev S., Ghimire B., 2022).

Other studies have eventually analyzed all results coming out of 2000 peer-reviewed papers since 1970 on the subject and reveals that 90% of these studies “find a nonnegative” ESG-CFP¹⁷ relation”. In addition, a “majority of these studies even showed a positive relationship between the ESG performance and the stock return”. They also reveal that better results are achieved when splitting for markets and asset classes (Friede G., Busch T. & Bassen A., 2015).

¹⁷ Corporate Financial Performance

A recent study, in partnership with the MSCI¹⁸ shows that the ESG performance of companies is reflected in their valuation through their “systematic risk profile” and “idiosyncratic risk”. This research shows well that it might be very useful and wise for investors to use “ESG characteristics change and ESG ratings into their investment decision-making” (Giese G. & al., 2019).

It is also important to “consider size of companies when evaluating” the relationship between ESG factors and financial performances. Research shows an “overall increase in financial performance for companies in the UK with a high ESG rating compared to companies with lower ESG ratings” though the “effect is mixed in the case you split for each ESG thematic” (Ahmad N., Mobarek A. & Nawazesh N, 2021).

The whole ESG landscape is evolving at a fast pace due to “changes in consumer’s and individuals’ preferences, government policies, regulation and ESG-ratings accuracy”. Ms. Ward, Chief Market Strategist EMEA at JP Morgan Chase & Co. even question the relevancy of taking “historical analysis of the relationship between ESG issues and financial performance in order to assess the same relationship in the future” (JP Morgan a., 2021).

Evolution of Friedman’s view

It is interesting to reconcile Friedman’s old view with the current beliefs as he mentioned that “executives should act in the best interest of the business and of investors” (Friedman, 1970). It has been well established that the “cost of repairing consequences of the global warming will be much greater than the cost of mitigating it” (EEA, 2023). In addition, it has been established that it is more than ever essential to protect its company against reputational risk related to sustainable controversies (CNN Business, 2019).

As a result, if we take these elements into account in Friedman arguments transform the conclusion because it has now therefore become in the best interest of the business and investors to invest massively into Environmental, Social and Governmental issues.

¹⁸ Morgan Stanley Capital International

ESG integration as a trade off?

Companies are often facing trade-offs when developing sustainability strategies as they are not seeing any improvement in profitability or valuation after investing into sustainability initiatives. A study published in 2013 in the HBR¹⁹ explains that it “key to focus on the most material issues to shareholders” and then to develop “innovations, processes and business models to prioritize this specific issue” (Eccles R. G. & al. 2013).

ESG as a value creation source

The HBR literature emphasises on the fact that only “actual changes at the heart of a company strategy and operations to integrate further sustainability” matters make a change at investors ‘eyes. He identifies 5 key steps for achieving this long-term added value creation. It is important to start by identifying “material issues of the industry” and to “implement initiatives to differentiate from competitors”. Secondly, it is critical to make sure the “board is fully supporting the strategy” as it will then translate into the whole company feeling a “new sense of purpose”. Finally, “ESG should be decentralized into operations” and “ESG progress should be communicated transparently to employees and investors”. (Serafeim G., 2020)

Companies can get value from adopting ESG at the heart of their strategy and operations in many ways. It forces companies to think further and it can bring more “growth opportunities by thinking out of the box”. They can “enhance their operational efficiency” thanks to “process optimizations and waste minimisation”. They can improve their “risk management by identifying and mitigating” all kind of “financial and non-financial risks”. The framework push to “consider as many stakeholders as possible and therefore enhance relationship” with all of them. Finally, many investors are looking to “invest only into well ESG-aligned companies” and it consequently “increase access to capital” (McKinsey & Co. a., 2019).

Larry Fink, CEO of Black Rock strongly believe that a “company’s purpose and ESG leadership are key for its long-term value creation” (BlackRock, 2022). According to a research

¹⁹ Harvard Business Review

performed by BCG, companies which performs very well on ESG areas benefit from valuation multiples that are 3 to 19% higher than peers scoring at the median (BCG c., 2022).

However, some companies face some difficulties to observe significant positive results to their ESG initiatives. It might be explained by the fact “their commitments are not bold enough for the challenges they face” which translates into “disjointed, incremental, or generic efforts” leading to inauthentic ESG change no rewarded neither by employees, customers or investors. It is critical for these companies to realize that making ESG “part of the core business and strategy requires fundamental change” in order to be able to catch some new opportunities that create societal and business value (BCG c., 2022).

A research published by Bain find a correlation between financial results and 4 ESG areas: “Diversity, equity, and inclusion; Employee satisfaction; Renewable energy; Sustainable supply chain” (Bain & Co. c., 2023).

In addition, their findings show that “positive ESG outcomes are a trait of successful companies” and that “sustainability measures correlate with better financial performances”. However, they emphasize on the fact that “many factors influence a company’s financial results” and that it is therefore “not possible to say to companies’ sustainability efforts led to their strong financial outcomes”. They mention well that all the ESG perspective is “only recently formed and likely to grow larger quickly” (Bain & Co. c., 2023).

The ESG framework has to stand at the “heart of the company’s purpose” in order to have an “impact on the whole company” across every business units and functions. This might require a comprehensive “re-examination and rethinking of the business drivers”. In addition, it is fundamental to understand that “adopting ESG framework is absolutely not being altruistic”. On the contrary, the ESG concept might enable “to boost innovation, attract & retain more talents, enhance customer relationship and improve margins and profit” (BCG c., 2022). A Bain research also confirms that ESG can bring value across all sectors by “helping attract and retain talents” which is especially important in a context of a “war for talents” (Bain & Co. a., 2023).

The ESG framework can also be used as a tool to “maintain and enhance a company’s social licence²⁰” which strengthens relations with stakeholders. Companies should focus on specific ESG areas on which they can bring a significant impact (McKinsey & Co. b., 2022).

A research published by Bain & Co. emphasizes on the fact companies don’t have “to choose between sustainability and strong financials anymore”. Some executives might still believe that “investments in green solution are too costly and risky” but these beliefs are taken from a pure “statistic perspective taking only into account the current cost structure and scale”. From a dynamic point of view, it becomes much more attractive to “adopt green solutions at the lowest cost possible to build a long-term competitive advantage”. It requires of course an early significant “cash investment upfront” for scaling quickly in order to succeed but also offer a new pool of profit to the market-making incumbent” leading on the new market or segment (Bain & Co. b., 2023).

The key for succeeding in such business transformations is to master the “experience (i.e.: costs) and adoption (i.e.: customers) curves”. The first scenario in which the “green substitute can be produced at a lower cost at scale” makes the first move extremely advantageous. The second scenario in which the “green substitute cannot be produced at a lower cost at scale” makes it less attractive to be the first to move though all the industry will have to due to “ESG regulations and associated additional cost” (Bain & Co. b., 2023).

Legal consideration about ESG

There are some important legal matters companies should take into account in this fast-evolving ESG landscape. They have to represent best interests of investors and investors’ preferences changed in the last decade. The previous model was aligned on the fact that companies should only maximize shareholder’s value. However, investors’ preferences evolved and the model, purposes of companies should therefore evolve as well as they are still required to represent all their investors best interest and preferences.

A research shows that on average, “investors are willing to give up some return to enhance social interest of the company”. According to their study, “only 32% of investors

²⁰ « The perception by stakeholders that a business or industry is acting in a way that is fair, appropriate, and deserving of trust » (McKinsey b., 2022)

would not give up any return for improving social interests”. Finally, there is a strong “heterogeneity in investor’s willingness to give up some return” to improve social interest and this heterogeneity mainly “depends on the political affiliation, the gender and the income” (ECGI 2023).

Discrepancies across ESG-rating providers

It is currently difficult for ESG rating providers to reflect fairly the ESG performance of companies. Discrepancies across different ESG ratings such as the KLD, Sustainalytics, S&P Global, Moody’s ESG, Refinitiv, MSCI and Bloomberg are a good proof of this difficulty to reflect accurately a business reality. A research conducted by the MIT Sloan and St Gallen shows that “56% of the divergence come from measurement, 38% from the scope and 6% from the weight” (Berg F. & al., 2022). Although it is currently difficult for rating providers to be aligned, companies should understand that it is anyway crucial for them to address their externalities and to focus on ESG in order to improve their long-term financial performance (McKinsey & Co. b., 2022).

Many difficulties arise when ESG rating providers collect data for assessing companies. For instance, it is difficult for “smaller companies and companies in fixed income market” to assess their coverage. “Languages” also seems to pose some difficulties to accurately get the whole information of some documents, “especially in emerging markets” (JP Morgan a., 2021).

The weight given to each issue when computing the aggregate ESG rating evolved over the years. It should definitely “be acknowledged when analysing data from the past 10 years”. For instance, the weight for “governance probably have been the heaviest factor for a period, then it evolved to a focus toward environmental issues and board diversity” (JP Morgan a., 2021). They are finally now being selected based on the SASB materiality which depends notably on the industry.

ESG in M&A

According to a report published by Bain & Co., in M&A processes, “65% of executives expect their own company to increase their focus into the ESG framework”. However, there is currently only “11% of them assessing regularly extensively ESG characteristics during a deal process”. It makes it the “least used element during a deal-making process” and that is mainly

caused by the “difficulties to implement an ESG assessment” into this process (Bain & Co. a., 2023).

There is a difference between “ESG-motivated deals and ESG-conscious deals”. The former means the “buyer wants to seal the deal explicitly to respect their own ESG-agenda” and happens “mostly in large CO2-emitters industries”. The latter means the buyer is “only taking ESG criteria into his decision-making process in a deal whose goal is absolutely not about ESG”. ESG criteria are taken into account in “75% of deals in the Energy and Natural resources industry, with 40% of ESG-motivated and 35% of ESG-Conscious deals. For all other industries, ESG criteria are only taken into account in 48% of the deals (Bain & Co. a., 2023).

ESG European regulation

Companies that fully integrate the ESG framework into their business model will have a significant advantage in the future to comply with the coming regulation such as the EU Corporate Sustainability Reporting Directive (i.e.: CSRD) (BCG a., 2022).

The CSRD modernises the “NFRD in term of quality and accessibility of sustainability” reporting by bringing 3 major new features compared to the NFRD: the content to disclose, the number of companies it concerns and the requirement of being audited (EC CSRD, 2022).

First, it adds a new concept called the “Double Materiality” which basically force companies to disclose non-financial information about on the one hand “how sustainability might create financial risk for their own company (i.e.: financial materiality)” and about “how their company impact might affect people and the environment on the other hand (i.e.: impact materiality)” (EC CSRD, 2022).

Second, it “applies to all (i.e.: listed or non-listed) large companies meeting at least 2 of these criteria: more than 250 employees, a revenue of more than 40 million EUR and total assets of exceeding 20 million EUR”. This basically covers “approximately 50,000 companies and more than 75% of total EU’s revenues” compared to “11,000 under the NFRD”. In addition, it also applies to “non-European companies generating a revenue exceeding 150

million EUR within Europe” and having either “a subsidiary considered as large entity or that has EU-listed securities or that have a significant branch generating a revenue exceeding 40 million EUR” (EC CSRD, 2022).

Third, it involves the participation of a “3rd party to audit the report to bring a limited level of assurance and requires the involvement of a key audit partner” to assess it (EC CSRD, 2022).

This new regulation comes into application in 3 phases. First, “companies already being concerned by the NFRD have to report in 2025 for 2024 data”. Second, large companies “not currently concerned by the NFRD have to report in 2026 on 2025 data”. Finally, “all others (i.e.: listed SME’s, small and non-complex credit institutions and captive insurance entities) have to report in 2027 on 2026 data” (EC CSRD, 2022).

Companies concerned by this new regulation might be completely destabilized in the short term as they will have to comply with it quickly and for some with no previous experience (BCG a., 2022).

The regulation within countries about climate change can also impact financial performance and risks of a company, especially in downturn periods such as the covid one. Díaz-Peña L.d.C. & al. also find that the “S” component is the most correlated with the combined ESG score (Díaz-Peña L.d.C. & al., 2022).

ESG as a challenge?

It is interesting to note that, “73% of CFO’s in the US currently give at least moderate consideration to ESG when making decisions” according to a survey published by Grant Thornton LLP. A quarter of CFO’s being surveyed say ESG disclosures will represent “one of their biggest challenge their business will face in the next 6 months”. It is impressive to observe that this proportion doubled since last year. In addition to the risk of not complying with soon coming regulation, the reputational risk is also one to keep considering very carefully. The value for a publicly traded company is eventually “more important than its financial and assets value” (Grant Thornton, 2023).

Different impact of ESG ratings on Equities and Fixed Income

It is important to notice the asymmetry in term of impact from a change of the ESG rating on a fixed income or an equity. As a matter of fact, these 2 financial instruments have distinct characteristics. A fixed income investor is mainly concerned about “getting back the agreed coupons and principal return”. On the contrary, a stock or equity holder, is concerned about his “final return which depends on the expected return over the life of the asset” (JP Morgan a., 2021).

In a case where a public announcement affects positively a company business model, it would “benefit the equity holder as the stock value would increase” whereas it would “not benefit the bond holder planning to keep the bond until maturity” as he would not receive a higher coupons or principal repayment than initially agreed. In the opposite case, after a public announcement which impacts negatively a company business model, it would “harm the equity investor as the stock value decrease” and for the bond holder who planned to keep the bond until maturity, it would “increase the risk of the bond and might put the principal repayment at risk if the announcement affects the long-term viability of the company” (JP Morgan a., 2021).

The future of the ESG framework impact

It is key for executives and investors to understand that the current impact of ESG factors on companies’ financial performances is still at “an early stage of development” and we therefore “expect their impact to be much greater in coming years”. JP Morgan Chase identified 5 areas that might influence significantly this impact in the future (JP Morgan a., 2021).

First, it is critical to consider “government ambitions and regulatory policies” as they can accelerate the transition to a Net-Zero economy by imposing “additional taxes, on carbon emission for instance or by subsidizing sustainable initiatives, such as EV²¹’s”. By the way, it is impressive to observe how the “market react to political news such as an election result or to an announcement such as a new regulation” to comply with. For instance, the announcement

²¹ Electric Vehicules

of the Chinese government to be CO₂ neutral by 2060 or the election of President Joe Biden knowing his climate agenda (JP Morgan a., 2021).

Second, “Central banks asset purchases and regulatory initiatives” are playing a major role in the government decisions to ensure that “private capital forms are headed in the same direction”. They have an impact through 2 distinct channels. On the one hand, they have the “power to decide which asset class they buy”. On the other hand, they can also use the “regulatory framework to direct funds in the right direction” (JP Morgan a., 2021).

Third, “decision-makers are committed to their Net-Zero strategies” and are therefore “increasing regulation about ESG disclosure” by working hand to hand with regulators and central banks. This is making “investment decisions” much easier as it enable both “investors and consumers” to make decisions based on transparent facts (JP Morgan a., 2021).

Fourth, “current sustainable trends on the market made the reputational risk for companies’ brand, an intangible capital”, much more important and riskier for publicly traded companies (JP Morgan a., 2021).

To sum up, the ESG framework has “the ability to affect a company’s profitability” due to lower revenues and higher costs. On the one hand, government, central banks, consumer preferences and transparent disclosure may impact revenues of companies. On the other hand, these same factors can affect companies’ cost of capital through notably green bonds, that have a lower spread, the “Greenium²²”, compared to traditional bonds (JP Morgan a., 2021).

ESG Finance

The Net-Zero journey will require some “fundamental changes of business models” with the “help of new technologies for high-carbon emitter industries such as agriculture, construction, heavy industry and transport”. A Goldman Sachs research show that 3.1 trillion USD are yearly needed in order to decarbonize 75% of global current emissions and a lot of progress is still needed to achieve objectives (Goldman Sachs a., 2023).

²² « Greenium”: The term greenium describes the idea that investors are willing to pay a premium to hold a green bond rather than a conventional bond, as they are willing to accept lower monetary returns in exchange for supporting environment-benefitting activities. (ECB, 2022)

In the past few years, the Principles for Responsible Investments²³ (PRI) saw an exponential number of new signatories, to reach a community having together about 120 trillion USD AUM of at the end of 2021 (Goldman Sachs a., 2023).

The SFDR²⁴ methodology enables to divide products of asset managers, financial advisers and insurance providers in the EU into 3 important categories for the ESG finance: article 6²⁵, article 8²⁶ and article 9²⁷. Article 8 and 9 fund assets currently “hold 4.9 trillion EUR in 2023” which “represent 57% of the whole EU fund universe”. It seems important to emphasise that article 9 represent “only 3.2% of the whole EU fund universe” and that these are « expected to be 100% sustainable investment, except for instruments held for hedging or liquidity purposes » (Morningstar b., 2023).

MSCI year in review

Last year, the MSCI ACWI ESG index was outperformed by the MSCI ACWI index. This underperformance is mainly due to an underweight of the ESG index in the energy sector who performed extremely well due to higher energy prices though “higher ESG-rated companies brought a positive contribution”. In the last quarter of 2022, energy prices came back to a normal level and it explains why the MSCI ACWI ESG Universal and Leader indices outperformed the MSCI ACWI for the last quarter (MSCI, 2023).

In the first half of 2023, most of the MSCI ACWI Climate and MSCI ACWI ESG indexes outperformed the MSCI ACWI index mostly due to the very positive and high performance in the information technology sector. Once again, the overall index performance is mainly driven by the different sector allocation. (MSCI c., 2023)

²³ PRI : “The PRI is the world’s leading proponent of responsible investment. The PRI is truly independent. It encourages investors to use responsible investment to enhance returns and better manage risks, but does not operate for its own profit; it engages with global policymakers but is not associated with any government; it is supported by, but not part of, the United Nations ». (UN PRI, 2023)

²⁴ The SFDR specifies to financial market (i.e.: Asset managers, financial advisers and insurance providers in the European Union) participants the exact content, methodology and presentation of the information to be disclosed, thereby improving its quality and comparability. (SFDR, 2019)

²⁵ Article 6 fund is the default classification for financial products which does not have a sustainable investment objective nor promote environmental or social matters. (SFDR, 2019)

²⁶ Article 8 fund notably promotes, alongside other characteristics environmental or social characteristics. (SFDR, 2019)

²⁷ Article 9 fund target sustainable investments as an objective. (SFDR, 2019)

Greenwashing

The only way to stop greenwashing is to increase companies' transparency with stricter regulation. "Greenwashing" is defined as "when a company or an organization uses misleading advertising to market itself as more environmentally friendly than it really is" (WSJ, 2023). In a context where consumers are increasingly asking for sustainable products, it becomes highly profitable for companies to offer such products.

In the consumer goods industry for instance, "60% of consumers affirm they are willing to pay more for products with sustainable packaging". According to the Wall Street Journal, the last proposals of the European Union about products' environmental claims, which requires to disclose scientific evidence about sustainable claims and need to be confirmed by a third party afterwards might have a global impact in the world though these are only European rules. As a matter of fact, multinational usually prefer to play with same rules across the world and rules within the EU counting 450 million inhabitants might therefore have a significant impact about it. (WSJ, 2023) (EC Greenwashing, 2023)

According to the European Commission, "53% of green claims give vague, misleading or unfounded information, 40% of claims have no supporting evidence and half of all green labels offer weak or non-existent verification". This is the reason why the EC announced a new "proposal" in March 2023 about these sustainable claims to support the global initiative to "empower European consumers" toward a "green transition by enabling them to take decisions based on transparent and accurate information". The proposal contains "a set of rules and criteria aiming at banning greenwashing and promoting transparent claims through labels, scientific evidence and accredited verifier" (EC Greenwashing, 2023). These are once again new regulations that reinforce the accuracy of ESG ratings as these are based on companies' non-financial disclosures.

Qualitative Analysis

Introduction

Objectives of the qualitative analysis

A qualitative analysis is being conducted as part of this paper in order to assess the “subjective²⁸ experiences and perspectives of individuals and groups” (John W. Creswell, 2013). For this paper specifically, the analysis aims at understanding businesses’ perspectives about the impact of ESG ratings on their financial performances.

Overview of the methodology

The qualitative analysis is focused on Belgian listed companies, with an emphasis on companies included in the BEL20. The analysis targets executives of these companies through an online survey.

In a nutshell, the methodology is composed of, first, a preliminary self-training using well-known books to learn about the qualitative analysis “science”. Second, the survey was created using key insights and questionings from the literature review. Third, the online survey was sent to companies using investors relations contacts. Fourth, the analysis of the results was carried out through a thematic analysis. Finally, we compared results with the literature review by highlighting similarities and contrasts.

Methodology

Introduction

This “Methodology” section is composed of a thorough explanation of the methodology followed for the realisation qualitative analysis.

²⁸ Subjective : « Influenced by or based on personal beliefs or feelings, rather than based on facts” Cambridge dictionary

Training with books and Quadratics

The qualitative analysis is a kind of “science” and it is important to understand well what stands at the roots of it and how to make sure to respect all guideline. For this purpose, two well-known and rigorous books were used thanks to the UCLouvain access: “Educational Research. Planning, Conducting, Quantitative and Qualitative Research” by Creswell, John W and “Research Methods for Business Students” by Saunders, Mark N.K., Lewis, Philip, & Thornhill, Adrian.

This part of the thesis is precious as it enables us “to create valuable insights” from listed companies’ executives’ perspectives and to use it afterward by analysing results to set hypothesis that will be tested subsequently in the quantitative analysis (Creswell, John W, 2013).

The choice of a survey

The use of a survey for a qualitative analysis enables “to reach easily individuals” and is a gain of time for the respondents. Therefore, it enables to get “a comprehensive understanding of the research topic”. However, it is usually difficult to ensure that “only target respondent will answer and that they will answer accurately” according to their real beliefs (Saunders M.N.K. & al., 2016). This is specifically the reason why this survey focused its scope only to executives from the BEL20 either working for finances or the strategy. As a result, only targeted respondents access the survey, and it increases drastically answers trueness as questions are designed for them.

Realisation of the survey

The survey aims to collect answers from executives of Belgian listed companies. The survey was therefore especially designed for these executives having responsibilities such as CEO, CFO, Head of Investors Relations, Head of Financial communication who have a comprehensive view on the company strategy.

The survey is composed of 8 main parts: In a nutshell, it first introduces the thesis, followed by sections that identify the company and its respondents. Then, it assesses the current ESG practises within the company, investigate the existence of a relationship between ESG

and financial performances, gathers predictions for the future, looks into the impact of regulations. Finally, it discusses challenges and opportunities arising when implementing ESG initiatives and ends by seeking some advice for the regulator. **You can find the questionnaire in the appendix A.**

It is crucial to consider the importance of confidentiality when dealing with these kinds of information with listed companies. That is the reason why it is well mentioned that answers are anonymised for the analysis in this thesis and it involves ethical considerations for the analysis.

The survey was designed to maximize both answers usefulness for the study and the easiness for respondents to answer it. Different “types” of questions were used such as “open-ended questions”, “Multiple Choices Questions”, “Multiple Answers Questions” and “Likert scale questions²⁹”. For maximising the usefulness of future answers, questionings coming from the literature review were used to consider all important thematic of the topic. Then for maximizing the user experience of respondents, we looked for a great online survey software and “Qualtrics” seemed to match all business needs of the project. Finally, it is crucial to “pilot test an online survey to ensure that it is clear, concise, and free of any biases.” (Saunders M.N.K. & al., 2016) The tool Qualtrics has especially a function to pilot test the survey and it has been tested by looking at how acquaintances answered questions in real time.

It is important for researchers to “ensure that their findings are credible, trustworthy, and transferable to other contexts”. In addition, researchers should consider issues such as “bias, reflexivity, and subjectivity” (John W. Creswell, 2013). The very focused audience for the survey enables to increase significantly the credibility and trustworthy of findings. Regarding the bias, it is first important to acknowledge that we have one by default and then to bring modifications to make sure to correct it. The survey was realised following this process to make it as unbiased as possible. For every question, all potential perspectives of answers were presented to make sure not to lead a respondent in a certain direction.

²⁹ "A Likert scale, or rating system, is a measurement method used in research to evaluate attitudes, opinions and perceptions. “Qualtrics

Data Sample and survey distribution

The scope of the survey is mainly BEL20 companies but also some other listed companies. These were the companies who notably answered the survey: “D’Ieteren Group”, “Ageas”, “EVS”, “UCB”, “Edison”, “EDF”, “Proximus”, “Orange Belgium”, “CFE” and “Recticel”. These companies were contacted through various channels and notably through investors relations contacts, LinkedIn and mails.

Data analysis

It is finally in the data analysis that answers to the survey were reviewed. For each parts of the survey, the “thematic analysis” is conducted and aims at “identifying key patterns across answers” as well as “differentiations” (John W. Creswell, 2013). From a practical point of view, Qualtrics enables to analyse the data either by presenting graphs for each question or by showing the data in an excel file after an export. Both methods are used for this analysis.

Limitations

The methodology rigorously followed for this qualitative analysis has inevitably some limitations due to certain factors and it is important to think about it when analysing results of it. First, although the sample size is quite big for the BEL20 in Belgium, it is however also quite limited when comparing for Europe or the world. It is nevertheless important to mention that listed companies surveyed are very much international and therefore represent perspectives not only from Belgium. Second, although it is definitely the targeted audience who answered the survey and most probably with the best accurate answers, it is important to consider a potential bias in their answer. As a matter of fact, their answer could reflect the nicest part of their strategy but not necessarily the reality of the biggest part of their strategy.

Analysis of the results

Identification

On the overall, the online survey was answered by different types of executive's roles such as CEO's, CFO's, Head of M&A and Investors relations, and Head of Investors relations. The input they provide is extremely valuable and helpful for the analysis as they provide a comprehensive answer with a global perspective of the company short- and long-term strategy. These respondents are managing companies evolving in a diverse range of sectors which makes this multi-sectorial analysis even more insightful. Finally, the analysis involves a large spectrum of companies in term of market capitalization as it gathers data from companies having a market capitalization from below 500 million to over 20 billion. To sum up, the sample gathers data completed by the top-management, evolving in a diverse range of industries and in a wide range of market capitalization.

Selected key answers expressed with graphs

Q5 - Within your company, the fact that your global strategy fully integrates Environmental, Social and Corporate Governance (ESG) matters is

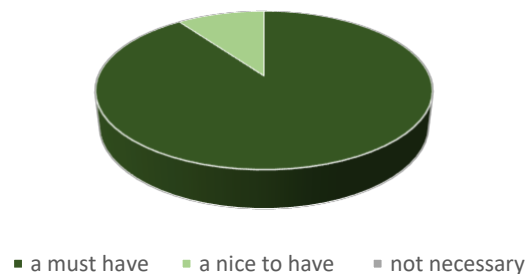


Figure 1 : Survey graph 5

Q6 - Is your company global strategy aligned with the Paris Agreement?

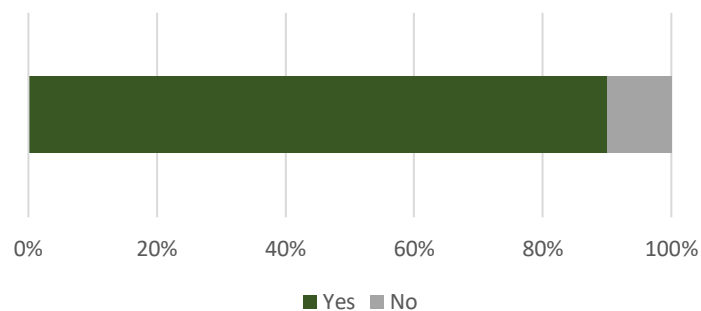


Figure 2 : Survey graph 6

Q9 - Is your sustainability report currently audited?

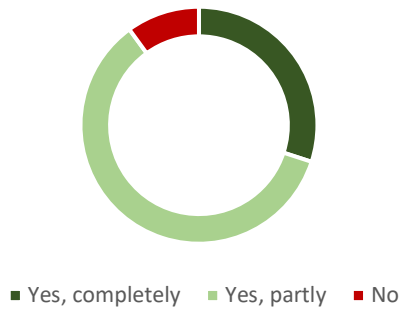


Figure 3 : Survey graph 9

Q10 - Do you feel it has become necessary to have ESG fully integrated in your global strategy to perform well in the coming years?

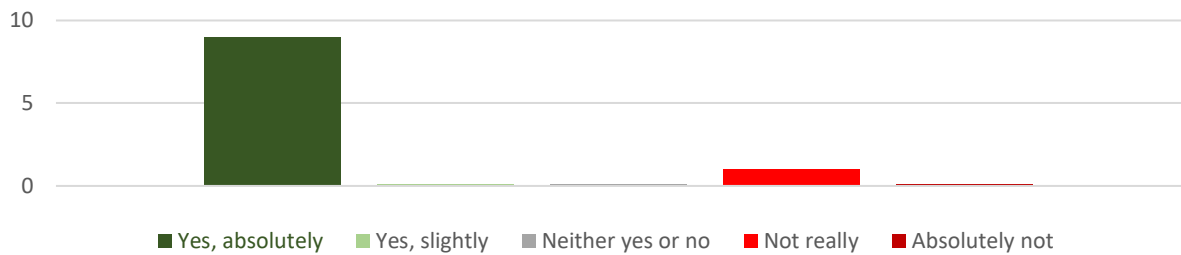


Figure 4 : Survey graph 10

Q12 - Have you ever observed a relationship between your ESG commitment, initiatives, actions and your financial performances on the stock market?

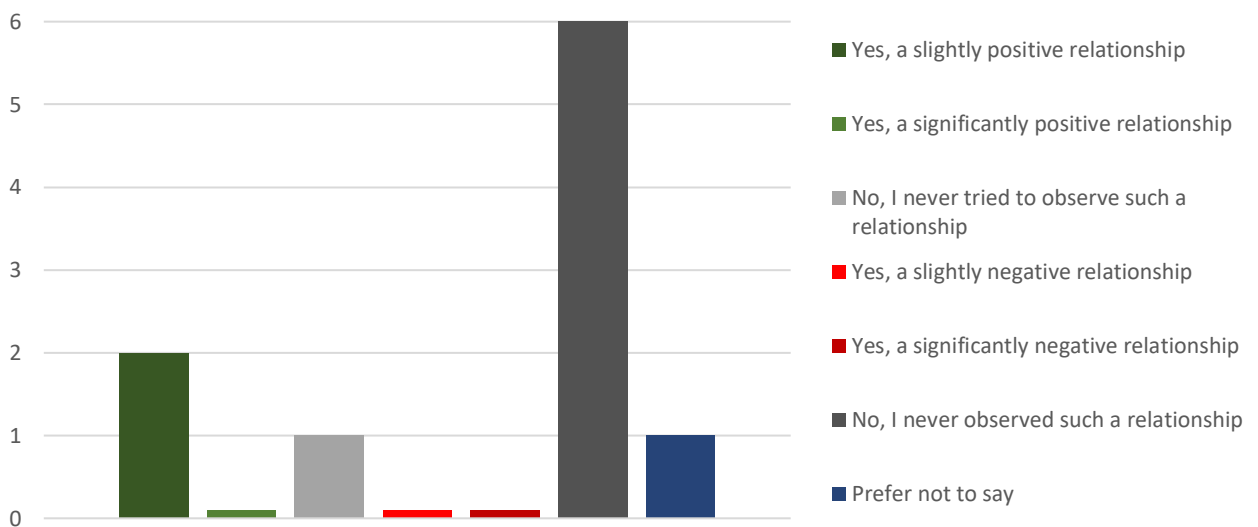


Figure 5 : Survey graph 12

Q13 - How would you expect the impact of your ESG commitment, initiatives, actions on your financial performances to evolve in the future?

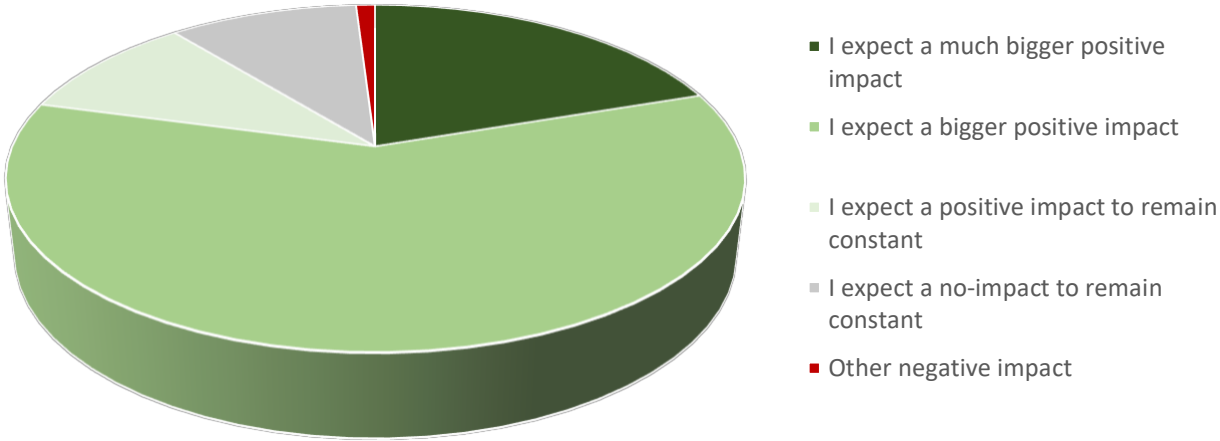


Figure 6 : Survey graph 13

Q14 - ESG disclosures represent one of your biggest sources of challenge for the next 5 years

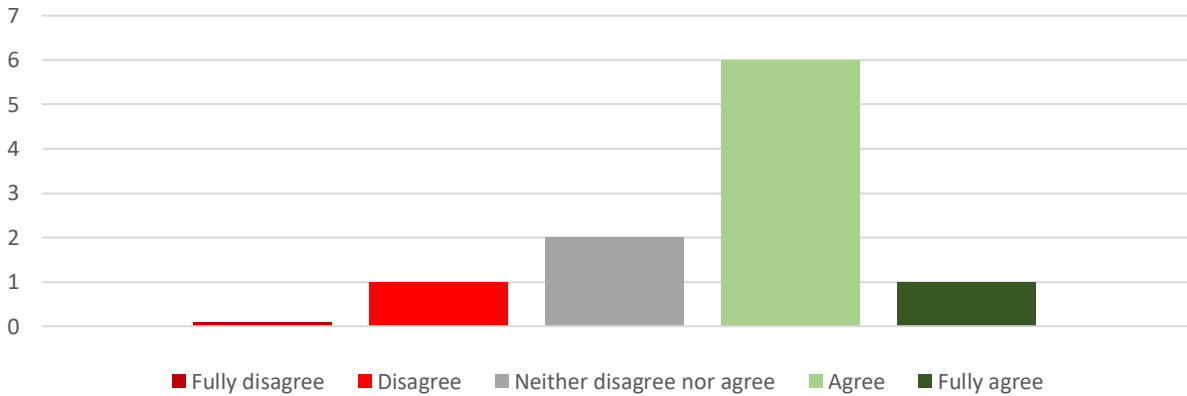


Figure 7 : Survey graph 14

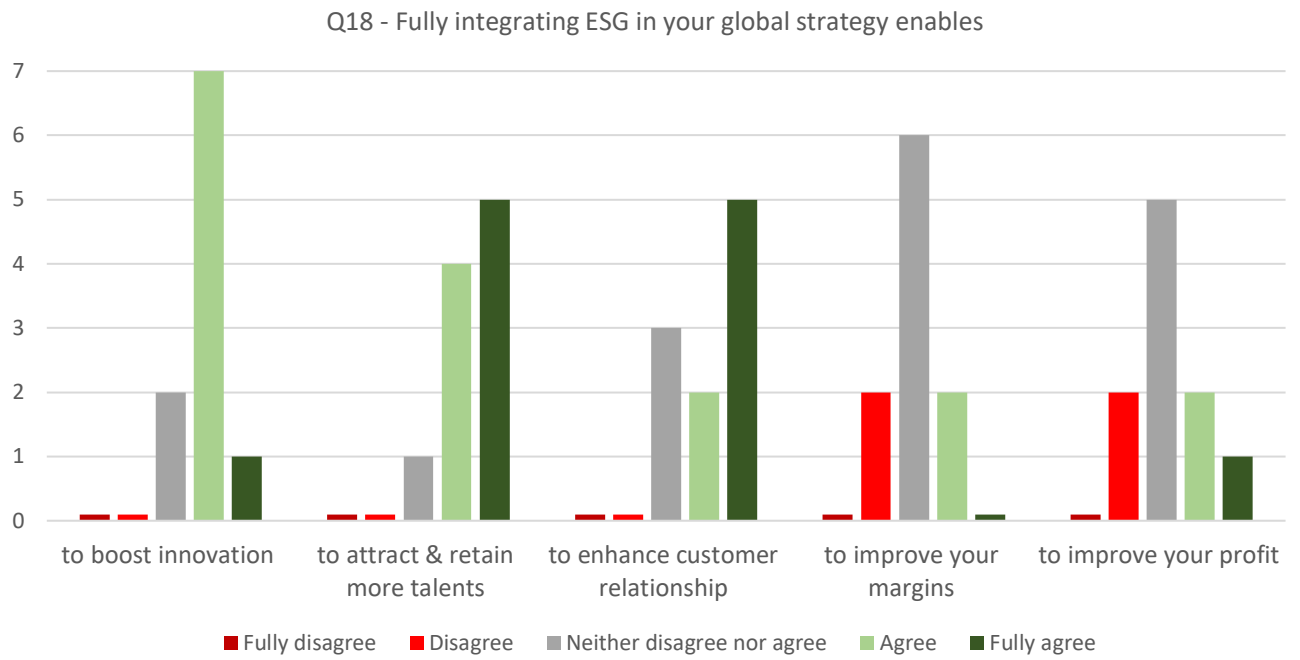


Figure 8 : Survey graph 18

Q19 - Do you consider that the current regulation regarding ESG is clear enough?

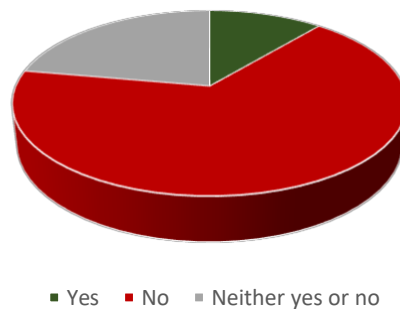


Figure 9 : Survey graph 19

Summary of responses

Here is a brief summary of all responses above. The questionnaire was separated in 8 parts: Preliminary questions about ESG, Relationship between ESG and financial performances, Impact of ESG on companies on a multi-level basis, ESG regulation, Reputational risk, Pressure from investors, Main challenges and opportunities when implementing ESG at the core of the strategy and finally some pieces of advice for future regulations.

To sum up, it appears that fully integrating ESG within the company global strategy has become a “must have” and it seems like most of these companies’ strategies are aligned with the Paris Agreement. We observe that the regulatory framework is kind of a mess where all companies are disclosing non-financial information using different framework and making it difficult for comparison between peers. Finally, most companies state that they currently are partly audited on these sustainability reports but the coming regulation (i.e.: CSDR) will bring a lot of change in the future as it makes it mandatory to fully audit these.

It seems like almost companies agree on the fact that it has become “absolutely necessary” to include ESG within their global strategy to perform well in the coming years. However, half of companies never tried to measure a relationship between their ESG initiatives and financial performances though it is planned to do so soon. The other half measured it but could not find any relationship until now. However, everyone seems to agree on the fact that they expect a bigger positive relationship in the future.

According to the survey, ESG disclosures represent one of the biggest sources of challenge for the next 5 years for most companies. Although they agree on the fact ESG integration within the global strategy brings value to their company and is reflected in their financial performances, they have more a kind of a mixed opinion when being asked if it brings a competitive advantage which is reflected in their valuation when comparing to peers.

In addition, they also have a mixed opinion when being asked whether fully integrating ESG within their company required, requires or will require fundamental change of their business model. It is probably explained by companies answering evolving in different sectors and having different business models within every sector. The majority of respondents agree

to say that integrating ESG in the global strategy enables to boost innovation, attract & retain talents and enhance customer relationship.

However, we observe some disparities in answers when asking for the impact of ESG initiative on margins and profit. This is probably explained by the different perspectives possible to take when answering the questions.

On the one hand, ESG initiatives can bring cost efficiency and productivity, brand value, effective risk management, boost innovation and customer loyalty and therefore improving margins.

On the other hand, ESG initiatives can also have high implementation costs, regulatory costs, transitions challenges, competitive pressures, supply chain complexity and consumer price sensitivity which can be detrimental for margins. Finally, it is important to consider taxation policies such as taxation incentives or penalties as well when assessing the impact on profitability.

All respondents agree on the fact that the regulation regarding ESG matters is not clear enough and that regulators should “simplify compliance and regulation”. In addition, they all expect the coming regulation (i.e.: CSDR) to have either a “slight” or “absolute” impact on their business.

All respondents also fully agree on the fact that they are considering their reputational risk linked to sustainability “more carefully” taking into account current sustainable trends. In addition, all of them feel an influence or a pressure from investors related to their ESG policies.

Finally, companies seem to face challenges when implementing ESG initiatives due to a heavy burden in term of time and energy for disclosing required files. The lack of reporting standardisation is also a challenge as it makes it very difficult for them to compare with peers on these. The process of monitoring ESG activities and keeping track of the progress also represent a real challenge. However, the ESG framework also enabled companies to become “front runner on innovation”, to do some “energy savings”, to “optimize their processes”, to “reinvent their various industries”, and “to strengthen their company culture”. They also came

up with some pieces of advice for the regulator designing future legislations such as “to keep it focused”, “manageable”, “straight to the point”, “avoid unnecessary workload”, “keep the business reality in mind” and finally “to remain pragmatic”.

Comparison of results with the literature review

This section provides a comparison of the results with the literature review by highlighting contrasts and similarities.

Similarities	Contrasts
ESG should be at the core of the global strategy, not a separate strategy	Contradicts Friedman's view that CSR should not be integrated into business decision-making
ESG framework can bring growth opportunities and innovation	BCG research on higher valuation multiples for ESG performers not confirmed
ESG is a tool to maintain and enhance social license	
Reputational risk is a significant concern for companies	
Impact of ESG on financial performance is at an early stage of development	
Companies expect the new regulation (CSDR) to impact their business	

Limitations

This section will provide limitations of this analysis and actions taken to mitigate these.

First, the scope of the survey is very much focused on a few numbers of potential respondents (i.e.: BEL20 or Belgian large listed companies) and the sample size is therefore specific. It is important to take this aspect into account when analysing the data and when drawing conclusions from it. Although the sample is not large, it is very qualitative as only targeted executives or investors relations employees of targeted companies answered the survey.

Second, it is important to consider the “response bias³⁰” when analysing results from an online survey. As a matter of fact, this response bias, which refer to “conditions or factors that influence a survey response such as the desire to comply with socially desirable answer” (Qualtrics, 2023). This is a crucial aspect to take care of as it can affect significantly the “validity and reliability”. This crucial limitation was mainly addressed by creating a survey that would aggregate answers and anonymised all respondents while still knowing who answered the survey. This is the reason why it was important to emphasize on the fact the survey results were anonymised.

Third, it is crucial not to restrict a global analysis to only an online survey when assessing a question like this one. It could indeed limit the “depth and richness of the qualitative data”. This is the reason why this paper uses the “methodological triangulation”³¹ by using data from the literature review, the qualitative analysis and the quantitative analysis.

Finally, it is important to consider the “researcher bias” when conducting this kind of analysis. As a matter of fact, it is important to acknowledge the fact that a researcher can have an impact on answer when writing down questions. This is why we made sure to acknowledge the potential biases as a researcher when preparing the answer and used the researcher reflexivity³² process. It enables to reflect on the researcher perspectives and “to minimize its impact by being aware of it”.

³⁰ « occurs in a survey research when the responses do not accurately reflect the views of the sample and the population” (John W. Creswell, 2013).

³¹ «” a term drawn from naval military science, it is a process where sailors use multiple reference point to locate an object exact position” (Jick, 1979)”. Applied to research, it means that investigators could improve their inquiries by collecting and converging different kind of data bearing on the same phenomenon” (John W. Creswell, 2013).

³² « means that the researchers reflect on their own biases, values ...” (John W. Creswell, 2013)

Conclusion of the Qualitative Analysis

The qualitative analysis assesses the subjective experiences in large Belgian listed companies through an online survey answered by top executives. The methodology involves self-training on the topic, survey preparation, multi-channel distribution and thematic analysis.

Our results reveal the importance of fully integrating ESG into the core global strategy. However, it appears more complex to establish a relationship between ESG initiatives and financial performances. Companies have different opinion on whether fundamental changes to their business model is necessary for bringing ESG into their core strategy, likely influenced by their specific sector or business model. For most of these companies, aligned with Paris Agreement, ESG disclosures will represent a major challenge in the future. On the one hand, answers diverge on whether ESG initiatives are beneficial for profit and margins, likely explained by key factors such as cost efficiency, risk management, innovation and customer loyalty. On the other hand, companies agree to state that ESG initiatives foster innovation, improve customer relationship and help retain talents.

Companies agree to say the regulation is unclear and that they feel pressure from investors regarding the sustainability. Although ESG matters represent an opportunity to optimize processes and reinvent an industry, it also involves time and energy to gather data and disclose results. Executives request regulators to prioritize simplicity, manageability and relevancy for future regulations while staying pragmatic and businesses oriented.

A comparison with the literature review shows similarities in the importance of fully integrating ESG, optimizing operational efficiency and addressing ESG disclosures challenges. However, the expected link between ESG performance and higher valuation was not confirmed.

This analysis has its own limitations such as the sample limitation, the response bias, richness depth and research bias mitigated by anonymisation, triangulation and reflexivity.

To sum up, the analysis shows that fully integrating ESG at the core of a company's strategy is essential and brings many advantages but the direct impact on financials remains to be clearly established.

Quantitative Analysis

Introduction

This section provides the objectives of the quantitative analysis and an overview of the methodology used.

Objectives of the quantitative analysis

The goal of this quantitative analysis is to empirically assess, with our own data and methods, the impact of ESG ratings on the financial performances of European companies through hypothesis testing. The objective of this research is to “systematically study and understand this relationship by collecting and analysing numerical data”. The idea behind it is to “assign numerical value to variables to enable statistical analysis and interpretations” (John W. Creswell, 2013) (Saunders M.N.K. & al., 2016).

Overview of the methodology

This section provides a brief overview of the methodology.

The methodology for the quantitative analysis is composed of 7 main steps and aims to ensure the right academic and statistic guidelines are well respected. In a nutshell, the first step is composed of self-training on econometrics through various sources of knowledge such as the online course of Cornell University, econometric classes. Second, variables required for the analysis were identified. Third, the data was collected from Bloomberg Terminals available in the “BESPO” library of the Catholic University of Louvain. Fourth, the data has been analysed through the use of the statistical software called “R” and use of hypothesis tests. Fifth, results from the statistical analysis were analysed. Sixth, results from the analyses were compared to the literature review to identify areas of similarities and contrasts. Finally, the conclusion of the analysis recapitulates all key elements from the analysis.

Methodology

Introduction

This “Methodology” section is composed of a thorough explanation of the methodology followed for the realisation quantitative analysis.

Self-Training on econometrics

This quantitative analysis definitely requires a strong statistical and econometric background in order to conduct it accurately. This is the reason why the first step of the methodology is to review econometric classes. This is the opportunity to refresh concepts such as multiple regression models and hypothesis testing using “null and alternative hypothesis, the statistic tests, the critical region, the p-value and the interval of confidence.” (S. Van Bellegem, 2021)

Variables collection

For this quantitative analysis, some variables were selected for the regression model. These different variables were selected following a rigorous process of reflexion and we will explain it later in a sub-sequent section.

Data collection

The data was collected through Bloomberg Terminals available in the “BESPO” library at the Catholic University of Louvain. Bloomberg is “the global business and financial information and news leader, that gives influential decision makers a critical edge by connecting them to a dynamic network of information, people and news”, and “quickly and accurately delivers business and financial information, news and insights around the world” (Bloomberg, 2023).

It was first necessary to familiarize with this powerful tool in order to leverage its best capacities. For this purpose, the Bloomberg ESG certification was obtained by the researcher through the accomplishment of a “self-paced and interactive e-learning course that shows learners how to implement ESG strategies and prepare ESG reports for regulators through the lens of a fictitious buy-asset management firm” (Bloomberg, 2023). The online course is

composed of 7 chapters, namely: “Introduction to ESG and Sustainable Finance”, “Researching and Adopting ESG”, “Negative Screening and Positive Screening”, “ESG Integration – Fixed Income”, “ESG Integrating – Equities”, “Corporate Governance and Shareholder Activism”, “Reporting Sustainability Activities”. As a result, Bloomberg became a worthy asset for the achievement of the quantitative analysis.

The next step was to create a list of European securities attached with their information about ESG ratings like the “Bloomberg ESG rating”, information about the financial performance like the “P/E”, the “ROE” or the “EPS” and about other information such as the “market capitalisation”, the “ROA”, the “GICS sector”, the “Beta” and the “leverage”.

For this purpose, the Bloomberg function EQS was used as it enables to “perform sophisticated searches for equity securities” (Bloomberg, 2023). On the EQS screen, it is possible then to screen securities with the following criteria: “Trading Status: Active”, “Country/Territory of Domicile: Western Europe”, “Securities Attributes: Show Primary Security of company only”, “Sector (BICS³³): Financials”, “Current Market Capitalisation >= 400 Million”. These are the criteria used to collect the data about equity securities from the Bloomberg Terminal.

It was decided to focus on Western Europe as it gathers the majority of securities in Europe. We also add a criterion about the sector that we change of course for each one of them. Finally, we set a criterion for the market capitalization in order to reduce the list of securities listed by the platform. It is important to do so because securities do not have an ESG rating when their market capitalization is too low, and it is therefore useless to get data about them. In addition, there is a threshold in term of data that it is possible to export monthly from Bloomberg to excel so it is for an efficiency question as well.

Afterward, it is possible to add some “Display Only Field” information about securities that will not sort securities further but only add additional information about these. This feature enables us to add the following information: “Current Price Earnings Ratio (P/E)”, “LF Return on Common Equity”, “GICS sector Name”, “LF Return on Assets”, “LF Total Debt to Total

³³ Bloomberg Industries Classification System

Equity”, “BESG Environmental Pillar Disclosure”, “BESG Social Pillar Disclosure”, “BESG Governance Pillar Disclosure”, “BESG Score”, “1-month Beta”.

As a result, we obtain a table with equity securities selected thanks to the criteria mentioned above and all financial and non-financial information mentioned just above as well. The next step is therefore to export all of these in an independent excel. This is done with the functions “Action” and “Export to Excel”. We finally have the desired data in an independent excel and Bloomberg is not necessary anymore.

Data analysis (R)

The next step is then to analyse the data we collected through Bloomberg with the statistical software named “R”. It is a “free language and environment for statistical computing and graphics”. This language has been chosen as it provides “a wide variety of statistical and graphical techniques, is highly extensible” and enables to easily produce “well designed publication-quality plots » (R, 2023). For the realization of the analysis and writing the R code, “RStudio” will be used. “RStudio” is an “interactive *integrated development environment* (IDE) » which is basically “an editor to create and edit R scripts” (Posit, 2023). The book “Data Analysis and Prediction Algorithms with R” by Rafael A. Irizarry, professor of biostatistics at Harvard, was used for coding during this quantitative analysis part.

From a practical point of view, RStudio is being used to perform our “multiple linear regression” to assess the impact of ESG ratings on the financial performance of European companies.

First of all, the data is being uploaded on the statistical software. Second, some variables like the “P/E”, “Bloomberg ESG rating”, “ROA”, “Leverage” and “Beta” are “centered and scaled”. It means that it centers and scales these variables to “mean 0 and standard deviation 0” (R. A. Irizarry, 2019). This enables “to improve the numerical stability as it makes sure that the criterion for finding linear combination of the predictors is based on how much variation they explain” (Li, H. L. a. M., 2023). Thirdly, we compute the correlation matrix for the independent variables to make sure that these variables are not correlated. As a matter of fact, it is important to check for collinearity between these independent variables because “in the presence of multicollinearity, regression estimates are unstable and have high

standard errors” (CRAN, 2023). Therefore, it proves that independent variables are not correlated thanks to the correlation matrix. Finally, the multiple regression model can be conducted taking the dependent variables and independent variables in the model.

The next step is to look at results of the regression model in R. Basically, the software will provide us estimation for the impact of each independent variables (i.e.: Bloomberg ESG rating, ROA, Leverage, Market Capitalization and Beta) on the dependent variable (i.e.: P/E). The software will also provide the significance of the result through the p-value. The “p-value” measures the “degree of credibility of H0 in relation to the observed data”. In a scenario where “the p-value is very low; we would reject the hypothesis H0”. More precisely we would reject the hypothesis H0 when the p-value is lower than 0.05, otherwise we would “fail to reject H0” (S. Van Belleghem).

The final step is to check the validity of the results from the regression model. For this purpose, we will use the “R squared” and the “F-test” metrics.

Basically, the R-squared is a statistical measure that “determines the proportion of variance in the dependent variable that can be explained by the independent variable, it shows how well the data fits the regression model”. However, it is important to mention that this metric does not provide any information about the “correctness of the regression model”. It is moreover less important when “the interest is to assess a relationship rather than to predict the model”. In this last case, a R-squared “in the range of 0.1 – 0.15 is reasonable” (Cornell, 2020) (CFI e., 2023).

The “F-test” is the second metric to assess the validity of the results. Basically, it “evaluates the null hypothesis (H0) that all regression coefficients are equal to zero, versus the alternative (H1), that at least one does not”. As a result, it shows whether “the observed R-squared is reliable” and “determines whether the proposed relationship between the response variable and the set of predictors is statistically reliable”. It is interesting to look at it “either for predictions or relationship explanations” (Cornell, 2020).

Hypothesis

We set and explain in details hypothesis for the following statistical analysis.

Results from the qualitative analysis are used in this section to set hypothesis we would like to test on the data. It seems like all respondents agree to say that they expect a “bigger positive impact” of the ESG ratings on the financial performances of companies in the future. However, they could not establish any relationship at this right moment either because they did not try to measure it or because they did not observe one.

These results are definitely very much interesting for setting hypothesis of this quantitative analysis. The main hypothesis will therefore be to test whether there is a relationship or not and will be expressed in the following way.

The null hypothesis

The null hypothesis basically “test the value of the parameter of interest”. (S. Van Bellegem)

$$H_0: \beta_2 = 0$$

Under this null hypothesis, we test if the value of the parameter β_2 associated with the variable *ESG rating* can “be modelled as being null in the regression model”. (S. Van Bellegem) In this case, H_0 can be viewed as the hypothesis according to which there is no relationship between the ESG rating and the financial performance (i.e.: P/E).

The alternative hypothesis

The alternative hypothesis is “what the value of the parameter should be if the null hypothesis is not correct”. This hypothesis is “very important in the case we manage to reject the null hypothesis” (S. Van Bellegem). Here we will set:

$$H_1: \beta_2 \neq 0$$

In this case, if we “reject the null hypothesis, the conclusion will be that β_2 is not null and can take positive or negative values” (S. Van Bellegem).

The quantitative model

This section provides an overview of the regression models and of the variables.

Specific feature of this analysis

This quantitative analysis brings 2 new features for the literature.

Sample choice

First of all, it is being conducted for different industries separately, namely: Communication, Consumer Discretionary, Consumer Staples, Energy, Financials, Health Care, Industrials, Materials, Technology and Utilities. The analysis is designed like this in order to be able to compare the relationship of ESG ratings on the financial performances of companies between these different sectors. As a matter of fact, certain sectors are or will be much more impacted than others by future regulations and certain sectors business models will change much more than others as well which makes this multi-sectorial analysis interesting.

Time horizon

The multiple regression model is based on data reflecting a one-point period in time, which is when the data was collected from Bloomberg on the 05/05/2023. Many analyses based their empirical analysis on data including a large time horizon. However, this is not the case for this one. As a matter of fact, as Karen Ward, Chief Market Strategist for EMEA at JP Morgan, mentions it, “the further we go back in time, the more likely it that the scoring data does not adequately capture the real-time ESG challenges” (JP Morgan a., 2021). There are 2 drivers that reinforce this perspective.

On the one hand, policies and regulatory framework about ESG evolve at a high pace and therefore improve over time the quality of what is being disclosed in the non-financial reports. This first driver is important to consider knowing that ESG ratings are based mostly on these disclosures. Therefore, in the case where everyone know that ratings are based on non-reliable information, it could not affect in any way the financial performance of a company as no one would even look at them as they would be biased.

On the other hand, ESG ratings composition has significantly changed over years and therefore do not assessed the same topics 5 or 10 years ago compared to now. As a matter of fact, the final ESG rating that we observe on Bloomberg is the result of a long process involving notably the weighting choice of ESG matters based on the materiality for a specific company evolving in a specific industry. The weighting of “corporate governance for instance have been the most important non-financial metric in the past” whereas it is much more nuanced now taking the materiality associated to each sector and industries into account (JP Morgan a., 2021) (SASB, 2023).

Variable selection

In this section we explain how we chose variables involved in the multiple regression model.

Basically, in the regression model, we assess the relationship between the ESG matters, represented by the *Bloomberg ESG rating*, and the financial performances represented by the *P/E ratio*. In addition, the model will also take into account other *control* variables (i.e.: *Market Capitalisation, ROA, Leverage* and *Beta*) in the model to “account for confounding factors, enhance the accuracy of the model, and isolate the specific effect of the independent variable of interest (i.e.: *Bloomberg ESG rating*)” (Austin P.C., 2016).

Dependent variable

P/E ratio

The *P/E ratio* (i.e.: Price/Earnings ratio) was chosen to assess the financial performance of companies for this analysis.

There are of course other indicators that could have been used for assessing it such as the ROE (i.e.: Return on Equity) or the EPS (i.e.: Earnings per share). Here are the reasons why it is the *P/E ratio* that was finally chosen. We notably used insights from the book named “Valuation: Measuring and Managing the value of Companies” published in 2015 by McKinsey & Co.

Let's first explain what the *P/E ratio* stands for. In a nutshell, it is a valuation metric used by investors to “assess the relative value of a company's stock by comparing its market price per share to its earnings per share (i.e.: EPS)”. So, it basically represents the “amount investors are willing to pay for each dollar of earnings generated by the company (McKinsey d., 2021).

The McKinsey & Co. book explains that a “higher *P/E ratio* suggests that investors have higher expectations for the company's future earnings growth and are therefore willing to pay a premium for it” and they eventually “view the company as having better financial performance”. On the contrary, a lower *P/E ratio* “may indicate that investors have concerns or lower expectations for future earnings”. It is especially relevant to compare the *P/E ratio* to “industry peers” as it helps to assess “how the market values the company's earnings relative to similar companies and provide insights into its relative financial performance” (McKinsey d., 2021).

It is really important to compare the *P/E ratio* between companies evolving in the same industries as other external factors can impact significantly the ratio. As a matter of fact, companies evolving in industries more exposed to economic conditions have wider *P/E* changes. For instance, cyclical industries such as the “automotive or construction may have wider fluctuations in *P/E ratio* compared to the healthcare industry” (McKinsey d., 2021).

A value-investor³⁴ would usually “look for companies with lower *P/E ratio* compared to their intrinsic value, indicating a potential undervaluation, as it would mean the market have underestimated the company's financial performances and future growth potential”. (McKinsey d., 2021) This concept might be especially interesting for our analysis.

It seems also important to consider limitations of using only the *P/E ratio* as a financial valuation metric. The McKinsey book mentions that using the *P/E ratio* alone may “overlook important factors which can impact its value such as the company's risk profile, capital structure and growth potential”. In addition, it seems also important to take company's earnings quality and sustainability into account when looking at the *P/E ratio*. As a matter of fact, a *P/E*

³⁴ « A value investor buys stocks at prices below their intrinsic value and waits patiently for their market price to reflect their true worth » Morningstar

ratio “based on transitory or low-quality earnings may not reflect accurately the company’s long term financial performance” (McKinsey d., 2021).

Independent variable

1. Variable of interest

a. Bloomberg ESG score

Choice of the ESG rating provider

The main purpose of the model is to explain the impact of ESG matters. It seems obvious to assess the ESG matters with one of the well-known ESG ratings such as ratings provided by the MSCI, Sustainalytics or Bloomberg.

All of these are serious sources of information and the ESG rating provided by Bloomberg was the one chosen for the analysis for the following reasons. First, Bloomberg is famous for its robust data platform and the serious processes used for “delivering quickly and accurately business and financial information” (Bloomberg, 2023). Secondly, the Bloomberg ESG rating seemed to provide the highest number of securities rating on the Bloomberg Terminal. Third, the methodology for computing the final ESG rating was presented in the “Bloomberg ESG certification” and enabled us to deeply understand how it is developed and foremost how it is currently evolving for providing the most accurate piece of information on the subject.

Bloomberg ESG score structure

The *Bloomberg ESG score* (i.e.: rating) “measures a company’s management of financially material³⁵ ESG issues” (Bloomberg ESG Score, 2023). The scale for the rating varies from [0-10], with “10” being the best score.

There are four pillars that makes the *Bloomberg ESG score* one of a kind. First, it is focused on “issues that drive financial impact on companies” with the “ES” being industry-

³⁵ « Financial materiality is defined as the issues that can have a negative or positive impact on a company’s financial performance, such as revenue streams, operating costs, cost of capital, asset value and liabilities. » (Bloomberg ESG Score, 2023)

specific and the “G” being adjusted on countries “policies and practices”. Second, it is “quantitatively-based” rather than relying on analyst estimates or opinion. Third, it is absolutely transparent and therefore enables users to watch “models, peer groups and underlying data” as well as to understand “all data driving each score and other features such as weights and percentiles”. Fourth, it is fully “integrated on Bloomberg Terminals” which enables users to “incorporate scores and underlying data in proprietary models” (Bloomberg ESG Score, 2023).

The *Bloomberg ESG score* follows a very well defined and public structure organised in 6 main features. It is basically organised in a pyramid structure with the “ESG headline score” at the bottom and all the other layer below subsequently to explain it further. The “ESG headline score” is a weighted³⁶ mean of individual pillar (i.e.: E, S, G) scores of the layer below. The “individual pillar score” are themselves a weighted mean of “Issues score” where the weight is being “determined by the BI³⁷ issue priority ranking³⁸ (Bloomberg ESG Score, 2023).

The “Issue score” is computed by taking the “performance score”, representing a weighted mean of “Sub-Issues scores”, and by scaling it by the “disclosure factor”, which basically assess the “quality and accuracy of a company ESG disclosures” (Bloomberg ESG score, 2023).

The “Sub-issue score” is an average of the “Field score”, representing the score obtained for “individual selected field”, weighted by the “fit/quality” assigned by the BI. The “Field score” is the last layer and finally grades “individual selected fields for scoring” (Bloomberg ESG Score, 2023).

Bloomberg ESG score process

The *Bloomberg ESG score* is the result of a well-defined “scoring process” composed on 5 main steps.

First, the “research phase” enables to determine the “issues selected” and “weights” using well-established frameworks such as industries guidelines of the SASB, TCFD, GRI,

³⁶ Weights depends on the industries

³⁷ Bloomberg Intelligence

³⁸

CDP that are identifying “material issues, key metrics and datapoints” of companies evolving in specific industries. In addition, Bloomberg uses its own “in-house” researches for completing these. Second, the “data collection and quality assurance” phase enable to gather the data from companies reports and to check for its accuracy (Bloomberg ESG Score, 2023).

Third, the “scoring” phase enable to assess selected issues based on “disclosure factor”, “activity metric” and “fit/quality” indicators. The next step is about “validation” to ensure the data and analysis are correct. Finally, the last phase is about “publishing and documenting” scores on Bloomberg Terminals (Bloomberg ESG Score, 2023).

So, the issues are selected by the Bloomberg research which notably “include recommendations of global standards such as the SASB”. The weights given to issues are determined based on a factor called the “issue priority” that depends on the “probability”, “magnitude” and the “timing” of the issue (Bloomberg ESG Score, 2023).

Bloomberg ESG score coverage

At this moment, the *Bloomberg ESG score* covers “approximately 5,500 large listed companies” around the world and eventually represents more than “88% of the world’s market capitalisation” (Bloomberg ESG Score, 2023).

2. Control variables

This section provides explanation about why these specific variables are included in the model.

a. Market capitalisation

The market capitalisation is important to include in the model as a control variable as it might have an influence on the *P/E ratio* and therefore it enables to control for the effect of a company size on the dependent variable. The market capitalisation is the “most recent market value of a company’s outstanding shares and therefore equal to the current share price times the number of outstanding shares” (CFI a., 2022).

b. ROA

The *return on assets* “is a measure of a company’s profitability and in its ability to generate profits from its assets”. It is simply showing how the company is doing by “comparing the profits it generates to the capital invested in assets” (CFI b., 2022). As a result this measure can definitely have an impact on a company investors valuation and is important to include as a control variable in the model.

c. Leverage

The *leverage* basically shows to which extent a “company is using debt for financing its activity” (CFI c., 2022). Being leveraged as a company might bring some additional financial risk and it is the reason why it is important as well to include it in our model to control for its effect on the dependent variable. In our model, we will use more precisely the common debt on common equity that simply compare how much a company’s borrowing to its equity.

d. Beta

Finally, the *Beta* measures “a security’s volatility, or systematic risk, relative to the movement in the overall market” (CFI d., 2022). Adding it in our model enables to control for the market risk on the dependent variable.

Multiple regression model

The empirical analysis is performed through a “multiple regression model” which basically “models the conditional expectation of the dependent variable Y with respect to the independent or explanatory variables denoted $X_1, \dots, \text{ and } X_k$ ” (S. Van Bellegem).

Our multiple regression model is expressed in the following way:

$$P/E = \beta_1(X_1) + \beta_2(\text{Bloomberg ESG Score}) + \beta_3(\text{Market Capitalisation}) + \beta_4(\text{ROA}) + \beta_5(\text{Leverage}) + \beta_6(\text{Beta}) + \varepsilon$$

Where $X_1 = 1$

Analysis of the results

This section provides a detailed explanation of results obtained for the different multiple regression model performed using “R”. These regressions are conducted for every BICS³⁹ industries, namely: Communication, Consumer Discretionary, Consumer Staples, Energy, Financials, Health Care, Industrials, Materials, Technology and Utilities.

Preliminary checks of the results

Basically, a regression model was created for each industry and gave as an output information about whether the *Bloomberg ESG score* have an impact of the *P/E ratio*. From a technical point of view, “R” gives us an estimation of the Beta’s for each variable and we specifically analyse the β_2 which represents the impact of the *Bloomberg ESG score* have an impact of the *P/E ratio*.

It is however essential to look at 2 metrics in order to assess if the model is significant. First, we look at the “Adjusted R-Squared⁴⁰” as well as the “p-value” of the “F-test” to check that the overall regression model is significant. According to the Cornell Statistics Consulting Unit, we can consider an “Adjusted R-squared” to be reasonable if is superior to 0.1 minimum as we are not preparing a “predictive model but rather assessing the impact of a specific variable of interest on the dependent variable” (Cornell, 2020). In addition, the p-value of the “F-test” have to be inferior to 0.05 in order to consider the “Adjusted R-squared” to be significant. If it is the case, we then look at the “p-value” of each “Beta estimations” to check whether these estimations are significant. This last check finally enables us either to reject the null hypothesis and admit the alternative hypothesis or otherwise to fail to reject the null hypothesis.

To summarise the analysis, on the overall, we obtained 6 regression models out of 11 that are significant with an “Adjusted R-squared” superior to 0.1 associated with a p-value of the F-test inferior to 0.05. These were the regression models for the Financial, Consumer Discretionary, Technology, Energy, Materials and Real Estate industries. As a result, we are able to analyse further the impact of ESG score on companies’ financial performances for these

³⁹ Bloomberg Industries Classification System

⁴⁰

industries. You will find in the appendix X a brief summary of the statistical model for these industries and I will only explain here results of it.

Reminder of hypothesis tested

$$P/E = \beta_1(X_1) + \beta_2(\text{Bloomberg ESG Score}) + \beta_3(\text{Market Capitalisation}) + \beta_4(\text{ROA}) + \beta_5(\text{Leverage}) + \beta_6(\text{Beta}) + \varepsilon$$

Where $X_1 = 1$

Hypothesis:

$$H_0: \beta_2 = 0$$

$$H_1: \beta_2 \neq 0$$

Regression models results

It seems essential to clarify that for all these industries, the regression model is statistically significant and that is the reason why we are able to analyse results further and able to assess hypothesis testing. Therefore, the following conclusions are based on the data retrieved from Bloomberg and a statistically significant regression model.

Financial industry

For the financial industry, the model is based on data composed on 110 securities and the β_2 is estimated at 0.084. It suggests a positive relationship between the *Bloomberg ESG Score* and the *P/E*. However, the p-value is not inferior to 0.05 and the estimation is therefore not significant. As a result, we fail to reject our null hypothesis which states that there is a relationship between the ESG score and the financial performance.

In a nutshell, according to our analysis conducted for the financial industry, the data does not provide support⁴¹ for the idea that higher ESG score are associated with higher financial performances.

⁴¹ It seems important to emphasize on the fact that we are not telling: “ the data shows us there is no relationship between the ESG score and the financial performance” as we are only performing statistical analysis, and this is a statistical conclusion. Same apply to next conclusions.

Consumer Discretionary

The second regression model is using data from 74 securities in the consumer discretionary industry and is significant on the overall and we therefore analyse its results. The p-value associated with the β_2 is superior to 0.05 and we can therefore not analyse the estimation of -0.21 of β_2 . In other words, we fail to reject the null hypothesis.

In a nutshell, according to our analysis conducted for the consumer discretionary industry, the data does not provide support for the idea that higher ESG score is associated with lower financial performances.

Technology

For the technology sector, the model is based on 43 securities and the estimation of β_2 is once again not statistically significant and we therefore fail to reject the estimation of β_2 equal to -0.28. We therefore fail to reject the null hypothesis.

In a nutshell, according to our analysis conducted for the technology industry, the data does not provide support for the idea that higher ESG score is associated with lower financial performances.

Energy

For the energy sector, the model is based on 30 securities and the estimation of β_2 equal to 0.044 is once again not statistically significant as the associated p-value is superior to 0.05. We fail to reject the null hypothesis.

In a nutshell, according to our analysis conducted for the energy industry, the data does not provide support for the idea that higher ESG score is associated with higher financial performances.

Materials

The regression model for the materials industry is based on 88 securities and the estimation of β_2 equal to -0.17 is once again not significant as the p-value is superior to 0.05. We therefore fail to reject the null hypothesis.

In a nutshell, according to our analysis conducted for the materials industry, the data does not provide support for the idea that higher ESG score is associated with lower financial performances.

Real Estate

The regression model for the real estate industry is based on 41 securities and the estimation of β_2 equal to -0.0016 is once again not significant as the p-value is superior to 0.05. We fail to reject the null hypothesis.

In a nutshell, according to our analysis conducted for the real estate industry, the data does not provide support for the idea that higher ESG score is associated with lower financial performances.

Summary of the regression models results

This section gives a brief summary of results obtained for the regression models conducted for this empirical analysis. In a nutshell, the empirical analysis is based on data about European securities from 11 industries retrieved from a Bloomberg Terminal and then analysed with a statistical software named “R” to conduct the analyses.

Basically, we analyse in our model the relationship between the independent variable of interest (i.e.: *Bloomberg ESG score*) and the dependent variable (i.e.: *P/E ratio*). In addition, we add other “control” independent variable to control for their effect on the dependent variable (i.e.: *Market Capitalisation, ROA, Leverage and Beta*). Our analysis brings 2 new features namely: the multi-sectorial analysis in order to allow for better comparison between industries and the single point in time analysis in order to minimize the bias of ESG score due to their accuracy changing so fast.

Our model:

$$P/E = \beta_1(X1) + \beta_2(\text{Bloomberg ESG Score}) + \beta_3(\text{Market Capitalisation}) + \beta_4(\text{ROA}) + \beta_5(\text{Leverage}) + \beta_6(\text{Beta}) + \varepsilon$$

We first have to make sure that our model is reliable and statistically significant. We use the threshold of an “Adjusted R-squared superior to 0.1 to consider our model reasonably significant”. (Cornell, 2023) For 5 out of the 11 industries, we could not analyse our model further due to a not-enough significant model. For all the others, we are then allowed to look further at our hypothesis testing on the data.

At the end of the day, we want to test under the null hypothesis (i.e.: H_0) that B_2 is equal to 0 and under the alternative hypothesis (i.e.: H_1 or H_a) that B_2 is different from 0. In other words, under the null hypothesis, there is no relationship between the *Bloomberg ESG score* and the financial performance (i.e.: *P/E ratio*), and under the alternative one there is actually one. Our regression model will always give an estimation of B_2 , but the p-value tells us whether it is statistically significant (i.e.: whether we can reject the null hypothesis).

For the Financial, Consumer Discretionary, Technology, Energy, Materials and Real Estate industries, we could not reject the null hypothesis. This mean that the data does not support the idea that there is a relationship between the ESG score and the financial performance.

It is finally important to note that these conclusions are specific to the data and model chosen for this analysis. There are definitely other factors, not taken into account here, that might have a considerable impact on results obtained. Future research might help to develop an even deeper understanding of this relationship between, the ESG score and the financial performance.

Comparison of results with the literature review

This section provides a comparison with insights gained in the literature review and aims at identifying contrasts and similarities with it.

Contrasts	Similarities
Larry Fink emphasizes ESG's importance for long-term value creation, but short-term financial impact not mentioned	Meta-study suggests majority of studies show a positive relationship between ESG and stock return
Results and Bain & Co. report both indicate ESG not extensively considered in deal-making	Research shows increase in financial performance for UK companies with high ESG rating
Karen Ward states ESG is at its infancy in terms of market impact	Bain & Co. in Private Equity suggests ESG outcomes correlate with better financial performance

Limitations

It is important to recognize that the quantitative analysis has of course its own limitations and this section will explain few of them.

First, it is important to consider the “sample limitation”. As a matter of fact, we have decided to restrict our analysis to securities traded in Western Europe for instance which might restrict the extent to which our analysis is generalizable to the rest of the world. It is however important to recognize that the western Europe already represent a very large sample. In addition, our sample is restricted to large market capitalisation. This is due to the fact small and mid-capitalisation mostly do not have a Bloomberg ESG score assigned to them and it was therefore impossible to analyse them.

Second, it seems essential to consider the “data limitations”. As a matter of fact, the quality of the data we use determines the quality of the analysis and conclusions for this quantitative analysis. It is however important to emphasize on the fact the data was retrieved from Bloomberg which is one of the most trusted financial information providers in the world. In addition, it is crucially important to consider the potential bias of the Bloomberg ESG score that we use in the analysis as this one represents a key pillar. While it is almost certain that Bloomberg ensures a highly quality framework for computing it, it is important to consider it is based on companies’ non- financial disclosures that are most of the time not being audited and therefore might not be as accurate as we would like to think of.

Third, it is critical to consider the “methodology limitations”. Conclusions of this analysis are effectively based on the regression model constructed for this specific analysis. While this is the econometric model that has been chosen for it, other models might have led to other conclusions. In addition, some variables were chosen to represent concepts in this model such as the “Bloomberg ESG Score” for the “ESG matters” and the “P/E ratio” for the company’s financial performances. Although these were chosen after a long reflexion and many considerations, it is important as well to consider that results and conclusions depend as well on these choices.

Fourth, the “external validity limitations” are also important to consider and especially the fact that the analysis is based on a specific point of time. This decision was however based on a series of well-defined explanation saying that it might not be accurate at all to assess the impact of ESG factors on financial performance over a long period of time given the pace at which their accuracy is changing.

Finally, the “interpretation limitations” are the final one to consider carefully. As a matter of fact, the analysis of such a relationship between the ESG factors and the financial performance is an extremely complex one. As a result, there might have others “unobserved” factors not taken into account in this analysis that might affect considerably the results.

To sum up, although all decisions for this quantitative analysis are based on thoughtful choices taking into account many academic guidelines, it is however important to consider limitations attached with the analysis such as: the sample, data, methodology, external validity and interpretation limitations.

MSCI multi-sectorial approach

In this section, we will provide an overview of the impact of ESG matters on the financial performances of companies for all industries together and from a different perspective. For this purpose, we will use this time the results published by the MSCI⁴² in their last research paper on the topic.

Methodology of the MSCI

The MSCI uses its own methodology in order to assess the impact of ESG matters on the company's financial performances. Basically, in research papers they publish, they use to compare performances of indexes composed of companies selected using ESG criteria with other global indexes regrouping companies selected only using their market capitalisation. For instance, they compare the performance year to year of the MSCI ACWI ESG Leader⁴³ indexes with the performance of the MSCI ACWI index⁴⁴.

MSCI ACWI ESG Leaders x MSCI ACWI index

In their last report, they published an analysis about the performance comparison between these 2 indexes over the past few years. It seems like the tendency has been that the “*MSCI ACWI ESG Leaders*” index “outperformed (i.e.: annualized return of 12.7%) the “*MSCI ACWI*” index (i.e.: annualized return of 12.2%) with a slightly higher annualized return and a lower annualized risk from 2012 to 2021”. The trend however changed in 2022 where the “*MSCI ACWI ESG Leaders*” index “underperformed (i.e.: -19.57% of annual performance) the “*MSCI ACWI*” index (i.e.: -17.96%)” (MSCI a., 2023). This change brought a lot of questionings and it appears that the sector allocation has a great role to play with it. The following discussion around sector allocation brings a brand-new dimension for the reflexion around the topic.

In the first half of 2023, most of the MSCI ACWI Climate and MSCI ACWI ESG indexes outperformed the MSCI ACWI index mostly due to the very positive and high

⁴² « MSCI Inc. is an American finance company and is a global provider of equity, fixed income, real estate indexes, multi-asset portfolio analysis tools, ESG and climate products. » (MSCI, 2023)

⁴³ MSCI All Country World Index ESG Leader

⁴⁴ MSCI All Country World Index

performance in the information technology sector. Once again, the overall index performance is mainly driven by the different sector allocation. (MSCI c., 2023)

It seems that the sector allocation of the *MSCI ACWI ESG* index have played a key role in its performance its past decade with notably a “relatively lower allocation to the energy sector and a higher allocation to the information technology compared with the other global index”. The trend reversed in 2022 with an enormous change in sectors past performances. From 2017 to 2021, the information technology sector for instance used to be the “best performer against all sectors and especially against the energy sector which used to be the lowest performer”. In 2022, economic conditions changed due to rising inflation, the war in Ukraine and geopolitical issues shifting the old sector performances. The energy sector was the “only highly performant sector in 2022 with a positive cumulative return while all others were negative and especially the information technology sector being the second lowest performer with a highly negative return” (MSCI a., 2023).

In addition, companies in the “defence and aerospace industry performed extremely well in 2022 due to these geopolitical conflicts bringing additional negative impact to the MSCI ACWI ESG index and positive impact to the MSCI ACWI index” (MSCI a., 2023).

Summary of the MSCI analysis

This section provides a brief summary of key insights gained thanks to the analysis conducted by the MSCI which aims to compare performance the “ESG performance” across a diverse range of industries.

Basically, the MSCI benchmark the performance of its “ESG” index to its “global” index to observe whether the selection of companies performing well on ESG criteria finally brings more financial performance. Although the MSCI used to show that the “ESG” index “outperformed the “global” one over the past few years, the macroeconomic changes and geopolitical conflicts enabled to show in 2022 that the outperformance trend could reverse itself and eventually showed that the “sector allocation” differences between these indexes might have had a considerable influence for the outperformance of the past few years” (MSCI a., 2023).

As a matter of fact, the “ESG” index have a “relatively lower allocation in the energy sector and higher in information technology” which used to benefit this index as the information technology was one of the best performers and the energy one of the worst performers. However, these sector performances changed in 2022 with the “energy sector rising and information technology sinking and affecting negatively the “ESG” index performances”. In addition, the “aerospace and defence industry, underrepresented in the “ESG index” used to perform badly in the last year but performed very well in 2022 due to rising geopolitical conflicts” and therefore again affecting badly the “ESG” index (MSCI a., 2023).

Conclusion of the quantitative analysis

The quantitative analysis assesses the relationship between ESG ratings and companies' financial performances through hypotheses testing on a Bloomberg dataset.

A thorough methodology involving leverage of the “Bloomberg ESG certificate”, data from Bloomberg Terminal and sophisticated statistical software was strictly followed for the analysis. The following model includes control variables to account for size, profitability, debt risk and security sensitivity to the market.

$$P/E = \beta_1(X1) + \beta_2(\text{Bloomberg ESG Score}) + \beta_3(\text{Market Capitalisation}) + \beta_4(\text{ROA}) + \beta_5(\text{Leverage}) + \beta_6(\text{Beta}) + \varepsilon$$

The multiple regression was performed on the “R” software by first eliminating outliers, scaling the data, ensuring the independent' variables independence and finally performing the regressions. The statistical model was significant for the finance, energy, consumer discretionary, materials, real estate, and technologies industries. However, for all of these sectors, the null hypothesis was not rejected, suggesting that the data does not support the idea that there is any relationship between ESG ratings and financial performances for these large European market capitalisation securities.

Our results are aligned with many aspects of the literature review showing that ESG is still at an infancy stage in term of impact to create market winners or losers. However, it is contradictory with other studies showing a positive impact of ESG matters on financial performances.

The quantitative analysis has its own limitations due to the data, sample, methodology and interpretation including the potential bias of the Bloomberg ESG Score.

The MSCI multi-sectorial approach that benchmark ESG indexes with global indexes highlights the significant importance of macroeconomic conditions and industry allocations on the financial performance rather than just the ESG rating.

To sum up, our data and models does not support the idea that there is any relationship between ESG ratings and financial performances.

Conclusion

This conclusion summarizes key insights from the qualitative and quantitative analysis that focused on the influence of ESG ratings, specifically the *Bloomberg ESG Score*, on European companies' financial performances across different sectors. This study uses a unique approach involving a literature review, an assessment of the ESG-landscape, qualitative analysis of businesses' perspectives and quantitative analysis through data and models.

Europe stands out as the most developed continent in terms of sustainable market development, carbon neutrality commitment and ESG-related regulation. It is the leader of the ESG market, accounting for 84% of global sustainable funds being estimated at 2.7 trillion USD. Europe is dedicated to achieving these goals through many initiatives such as the EU Green Deal, the EU Taxonomy while improving the regulation at the same time with the CSRD to ensure transparent and accurate information for investors and companies.

The growing impact of the global warming on humans, the biodiversity and the economy reinforce the desire of economic alliances, governments, decision-makers, regulators, investors and individuals to invest in ESG-driven initiatives. Investments play a crucial role for the transition and it has been estimated that 3.1 trillion USD is annually required for this purpose. Although it may seem extremely large, it has been proven that the cost of mitigating climate change is negligible compared to the cost of future climate-related extreme events.

Key decision makers engage their countries in climate change efforts and commit to Nationally Determined Contributions since 1995 at the annual Conference of Parties. Regulators adapt and establish new regulation on the subject and companies progress toward these new objectives with 80% of companies disclosing non-financial information with at least one of the 11 TCFD recommendation. However, there is still a long way to go to achieve key objective as only 4% of companies disclose according to the 11 TCFD recommendations.

The European Commission is being consistent with its international commitment by introducing, promoting and developing a sustainable economy. There is 30% of the EU multi-annual budget for the period 2021- 2027 invested into green investments thanks notably to the Green deal. In addition, the EU Taxonomy forces investors and credit institutions to disclose the degree of alignment of their portfolio with the taxonomy.

The literature on ESG evolved significantly, shifting from a focus on profit only according to Friedman's view to an unimageable quantity of reports on the subject showing the importance of including these aspects into a company strategy. Our research aligns on the existing literature on the fact that fully integrating ESG into the core strategy enables to unlock growth opportunities, develop innovation, improve operational efficiency, improve risk management and enhance customer relationship. It also definitely requires significant upfront investments and likely business model changes. On the other hand, opinions in the literature diverge when assessing whether being better aligned with ESG matters enable to improve financial performances. Our own research, which use a Bloomberg dataset and statistical models, does not support the claim according to which there is any relationship between both.

The qualitative analysis brings valuable insights about businesses' perspectives on the influence of ESG matters on the financial performance. Respondents agree that fully integrating ESG in their core strategy is crucial and all their strategies align with Paris Agreement. However, opinion diverge regarding whether it is necessary to fundamentally change their business model for it as well as whether it brings better margins and profit. There are some factors influencing this perspective such as the specific industry or business model as well as the potential elements of synergies taken into account.

The qualitative and quantitative analysis both have some limitations due to the sample size, response and researcher bias, data, methodology and interpretations of results. Actions were undertaken to mitigate the effect of these and keep a high-quality analysis.

This thesis could serve as a starting point for future research assessing for instance the CSRD's impact on European businesses and large international companies trading in Europe, understanding the importance of absolute vs change in ESG rating for financial performances and identifying those currently bearing the climate-related risk on the stock market.

To sum up, while our comprehensive analysis does not support the idea of ESG rating having a direct influence on financial performances, both the qualitative analysis and the ESG-landscape assessment suggest that ESG is still at an early stage of development with a potential significant and positive impact on financial performances in the future, eventually creating market winners or losers.

Sources

Books:

Creswell, J. W., & Guetterman, T. C. (2013). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*, 6th Edition. *Pearson*.

http://library.fip.uny.ac.id/opac/index.php?p=show_detail&id=6820

Irizarry, R. A. (2019). *Introduction to Data Science*. <http://rafalab.dfci.harvard.edu/dsbook/>

Li, H. L. a. M. (2023, April 18). *Practitioner's Guide to Data Science*.

<https://scientistcafe.com/ids/index.html#preface>

McKinsey & Co. d., Koller, T., Goedhart, M., & Wessels, D. (2020). *Valuation: Measuring and Managing the Value of Companies*. McKinsey & Co.

Saunders, M., Lewis, P., & Thornhill, A. (2016). *Research Methods for Business Students*

(7th edn). In *Pearson Education eBooks*. <https://epubs.surrey.ac.uk/816026/>

Articles:

Agliardi, E., Alexopoulos, T. A., & Karvelas, K. (2022). The Environmental Pillar of ESG and Financial Performance: A Portfolio Analysis. *Social Science Research Network*.

<https://doi.org/10.2139/ssrn.4086413>

Ahmad, N., Mobarek, A., & Roni, N. N. (2021). Revisiting the impact of ESG on financial performance of FTSE350 UK firms: Static and dynamic panel data analysis. *Cogent Business & Management*, 8(1).

<https://doi.org/10.1080/23311975.2021.1900500>

Bain & Co. a., Van Den Brande, J.-C., Seemann, A., & Lino, M. (2021). The ESG imperative in M&A.

Bain & Co. b., De Paepe, P., & & Al. (2021). Sustainability vs. Strong Financials: Now You Don't Have to Choose.

- Bain & Co. c.*, Seemann, A., Guyoton, S., Bianchi, A., & Han, J. (2023). How do ESG efforts create value?
- BCG a., Fantini, L., Leiendecker, J., & Testino, B. (2021). The new double materiality assessment.
- BCG c., Schear, M., Hutchinson, R., & Cuellar, M. (2020). ESG: from compliance to courage.
- Berg, F., Kölbel, J. F., & Rigobon, R. (2019). Aggregate Confusion: The Divergence of ESG Ratings. *Social Science Research Network*. <https://doi.org/10.2139/ssrn.3438533>
- Bloomberg ESG certificate (2022). Bloomberg ESG certificate. *Bloomberg*.
<https://portal.bloomberforeducation.com/certifications>
- Bloomberg ESG Scores. (2023). *Bloomberg*.
- Díaz-Peña, L.d.C., Delgadillo, V., & Iván, C. M. (2022). Financial firm's performance: a comparative analysis based on ESG metrics and net zero legislation. *Journal of Sustainable Finance & Investment*, 1–21.
<https://doi.org/10.1080/20430795.2022.2119830>
- Eccles, G., & Mirchandani, B. (2022). We Need Universal ESG Accounting Standards. *Harvard Business Review*.
- Eccles, R. G., Ioannou, I., & Serafeim, G. (2012). *The Impact of Corporate Sustainability on Organizational Processes and Performance*. <https://doi.org/10.3386/w17950>
- Eccles, R. G., Serafeim, G., Seth, D., & Ming, C. C. H. (2013). The Performance Frontier: Innovating for a Sustainable Strategy: Interaction. *Harvard Business Review*, 91(7), 17–18. <https://dialnet.unirioja.es/servlet/articulo?codigo=4317580>
- EC . (2023). *European Commission*. https://commission.europa.eu/index_en

- Freiberg, D., Rogers, J., & Serafeim, G. (2019). Pathways to Materiality: How Sustainability Issues Become Financially Material to Corporations and Their Investors. *Social Science Research Network*. <https://doi.org/10.2139/ssrn.3482546>
- Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), 210–233. <https://doi.org/10.1080/20430795.2015.1118917>
- Friedman, M. (1970). A Friedman doctrine-- The Social Responsibility of Business Is to Increase Its Profits. *The New York Times*.
- Giese, G., Lee, L., Melas, D., Nagy, Z. Z., & Nishikawa, L. (2019). Foundations of ESG Investing: How ESG Affects Equity Valuation, Risk, and Performance. *The Journal of Portfolio Management*, 45(5), 69–83. <https://doi.org/10.3905/jpm.2019.45.5.069>
- Goldman Sachs a., Van Nieuwenhuijzen, V. (2021). ESG way creating opportunities. *Goldman Sachs*.
- Graves, S. B., & Waddock, S. (1994). Institutional Owners and Corporate Social Performances. *Academy of Management Journal*, 37(4), 1034–1046. <https://doi.org/10.2307/256611>
- ECGI, Hirst, S., Kastiel, K., & Kricheli-Katz, T. (2023). How Much Do Investors Care About Social Responsibility? *European Corporate Governance Institute*.
- IPCC report: Urgent climate action can secure a liveable future for all.* (2023). IPCC. <https://www.ipcc.ch/2023/03/20/press-release-ar6-synthesis-report/>
- Khan, M., Serafeim, G., & Yoon, A. (2015). Corporate Sustainability: First Evidence on Materiality. *The Accounting Review*, 91(6), 1697–1724. <https://doi.org/10.2308/accr-51383>
- Krüger, P. (2015). Corporate goodness and shareholder wealth. *Journal of Financial Economics*, 115(2), 304–329. <https://doi.org/10.1016/j.jfineco.2014.09.008>

- Madison, N., & Schiehl, E. (2021). The Effect of Financial Materiality on ESG Performance Assessment. *Sustainability*, 13(7), 3652. <https://doi.org/10.3390/su13073652>
- McKinsey & Co. a., Henisz, W., Koller, T., & Nuttall, R. (2018). Five ways that ESG creates value.
- McKinsey & Co. b., Pérez, L., Hunt, V., Samandari, H., Nuttall, R., & Bellone, D. (2022). Does ESG really matter and why ?
- McWilliams, A., & Siegel, D. S. (1997). EVENT STUDIES IN MANAGEMENT RESEARCH: THEORETICAL AND EMPIRICAL ISSUES. *Academy of Management Journal*, 40(3), 626–657. <https://doi.org/10.2307/257056>
- Morningstar a. (2023). Global Sustainable Fund Flows: Q1 2023 in Review. *Morningstar*.
- Morningstar b. (2023). SFDR Article 8 and Article 9 Funds: Q1 2023 in Review. *Morningstar*.
- Nagy, Z. Z., Kassam, A., & Lee, L. (2016). Can ESG Add Alpha? *An Analysis of ESG Tilt and Momentum Strategies*. *The Journal of Investing*, 25(2), 113–124. <https://doi.org/10.3905/joi.2016.25.2.113>
- Pietsch, A., & Salakhova, D. (2022). Pricing of Green Bonds: Drivers and Dynamics of the Greenium. *Social Science Research Network*. <https://doi.org/10.2139/ssrn.4227559>
- Van Bellegem, S. (2021). Econometrie. *UCLouvain*.
- Serafeim, G. (2020). Social-Impact Efforts That Create Real Value. *Harvard Business Review*. <https://www.hbs.edu/faculty/Pages/item.aspx?num=58862>
- Shanaev, S., & Ghimire, B. (2022). When ESG meets AAA: The effect of ESG rating changes on stock returns. *Finance Research Letters*, 46, 102302. <https://doi.org/10.1016/j.frl.2021.102302>
- Signatory Update. (2022). *Principles for Responsible Investments*.

Sustainability-related disclosure in the financial services sector. (2018). *European Commission*.

TCFD Status Report 2022: Task Force on Climate-related Financial Disclosures. (2022). *Financial Stability Board*.

Transforming our world: the 2030 Agenda for Sustainable Development. (2015). United Nations.

<https://sdgs.un.org/2030agenda#:~:text=We%20resolve%2C%20between%20now%20and,protection%20of%20the%20planet%20and>

UNDRR. (2020). The Human Cost of Disasters: an overview of the last 20 years. *UNDRR*.

UNEP FI a legal framework for the integration of ESG into institutional investments. (2005).

UN Environment Programme. <https://www.unepfi.org/industries/investment/a-legal-framework-for-the-integration-of-environmental-social-and-governance-issues-into-institutional-investment/>

JP Morgan a., Ward, K. (2023). On the minds of investors.

Who Cares Wins: Connecting Financial Markets to a Changing World. (2004). *International Finance Corporation*.

https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_report_whocareswins__wci__1319579355342

Websites:

About Us – United Nations Environment – Finance Initiative. (n.d.).

<https://www.unepfi.org/about/>

Austin, P. C. (2011). An Introduction to Propensity Score Methods for Reducing the Effects of Confounding in Observational Studies. *Multivariate Behavioral Research*, 46(3), 399–424. <https://doi.org/10.1080/00273171.2011.568786>

BBC, Hotten, B. R. (2015, December 10). Volkswagen: The scandal explained. *BBC News*. <https://www.bbc.com/news/business-34324772>

BlackRock, Larry Fink's Annual 2022 Letter to CEOs | BlackRock. (2022). BlackRock. <https://www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter>

Bloomberg. (2023). Bloomberg LP. <https://www.bloomberg.com/europe>

Bloomberg Professional Services. (2022, February 7). *2022 Outlook: Global ESG | Insights | Bloomberg Professional Services*. <https://www.bloomberg.com/professional/blog/2022-outlook-global-esg/>

BloombergNEF. (2022, January 24). *Carbon Offset Prices Could Increase Fifty-Fold by 2050 | BloombergNEF*. BloombergNEF. <https://about.bnef.com/blog/carbon-offset-prices-could-increase-fifty-fold-by-2050/>

Boyd, A. (2021, October 5). Building a sustainable social license strategy. *S&P Global*. <https://www.spglobal.com/marketintelligence/en/mi/research-analysis/building-a-sustainable-social-license-strategy.html>

CNN Business, *Equifax exposed 150 million Americans' personal data. Now it will pay up to \$700 million*. (2019). CNN Business. <https://edition.cnn.com/2019/07/22/tech/equifax-hack-ftc/index.html>

CFI a., (2022). Market Capitalization. *Corporate Finance Institute*. <https://corporatefinanceinstitute.com/resources/valuation/what-is-market-capitalization/>

CFI b., (2023c). Return on Assets & ROA Formula. *Corporate Finance Institute*.
<https://corporatefinanceinstitute.com/resources/accounting/return-on-assets-roa-formula/>

CFI c., (2023b). Leverage. *Corporate Finance Institute*.
<https://corporatefinanceinstitute.com/resources/accounting/leverage/>

CFI d., (2023a). Beta Calculator. *Corporate Finance Institute*.
<https://corporatefinanceinstitute.com/resources/financial-modeling/beta-calculator/>

CFI e., Taylor, S. (2023). R-Squared. *Corporate Finance Institute*.
<https://corporatefinanceinstitute.com/resources/data-science/r-squared/>

COP, *Conference of the Parties*. (2023). United Nations Climate Change.
COP26,<https://webarchive.nationalarchives.gov.uk/ukgwa/20230401054904/https://ukcop26.org/>

COP27 Official. (2022). <https://cop27.eg/#/>

Cornell, Assessing the Fit of Regression Models. (2020). Cornell Statistical Consulting Unit.
<https://cscu.cornell.edu/resources/handoutstutorials/>

Corporate sustainability reporting. (n.d.). Finance. https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

CRAN, *Collinearity Diagnostics, Model Fit & Variable Contribution*. (2023). https://cran.r-project.org/web/packages/olsrr/vignettes/regression_diagnostics.html

EC CSRD, *Corporate sustainability reporting*. (2022). Finance.
https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

EC Greenwashing, *European Commission - Have your say*. (2023). European Commission - Have Your Say. <https://ec.europa.eu/info/law/better-regulation/have-your->

say/initiatives/12511-Environmental-performance-of-products-businesses-
substantiating-claims_en

Download RStudio | The Popular Open-Source IDE from Posit. (2023, June 7). Posit.

<https://posit.co/products/open-source/rstudio/>

EEA, *Assessing the costs and benefits of climate change adaptation.* (2023). European
Environment Agency. <https://www.eea.europa.eu/en>

European Green Deal. (2019) European Commission. [https://commission.europa.eu/strategy-
and-policy/priorities-2019-2024/european-green-deal_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en)

EU Taxonomy for sustainable activities. (2020). Finance.

[https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-
sustainable-activities_en](https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en)

Federal Trade Commission. *Equifax Data Breach Settlement.* (2022, December 20).

<https://www.ftc.gov/enforcement/refunds/equifax-data-breach-settlement>

*Grant Thornton survey: Finance leaders remain optimistic despite increasing worry about
costs | Grant Thornton.* (2023, April 11). Grant Thornton.

[https://www.grantthornton.com/insights/press-releases/2023/april/finance-leaders-
remain-optimistic-despite-increasing-worry-about-costs](https://www.grantthornton.com/insights/press-releases/2023/april/finance-leaders-remain-optimistic-despite-increasing-worry-about-costs)

Hale, J. (2019, November 8). *Enhancement to Sustainability Rating Emphasizes Material
ESG Risk.* Morningstar, Inc. [https://www.morningstar.com/sustainable-
investing/enhancement-sustainability-rating-emphasizes-material-esg-risk](https://www.morningstar.com/sustainable-investing/enhancement-sustainability-rating-emphasizes-material-esg-risk)

Homepage | GHG Protocol. (2023, June 5). <https://ghgprotocol.org/>

How Sustainability Is Transforming the Economy and Creating Opportunities for Investors.
(n.d.). [https://www.gsam.com/content/gsam/us/en/institutions/market-insights/gsam-
insights/perspectives/2023/how-sustainability-is-transforming-the-economy.html](https://www.gsam.com/content/gsam/us/en/institutions/market-insights/gsam-insights/perspectives/2023/how-sustainability-is-transforming-the-economy.html)

La Monica, P. R. (2017, September 14). *Equifax shares plunge again -- 35% in past week*. CNNMoney. <https://money.cnn.com/2017/09/14/investing/equifax-stock/index.html>

Measuring Stakeholder Capitalism. (2021, September 20). World Economic Forum. <https://www.weforum.org/stakeholdercapitalism>

MSCI a., *The Performance of ESG Indexes: Year in Review*. (2023). MSCI. <https://www.msci.com/www/blog-posts/the-performance-of-esg-indexes/03625107912>

MSCI b., (2023). MSCI ACWI ESG Leaders Index. MSCI. <https://www.msci.com/documents/10199/9a760a3b-4dc0-4059-b33e-fe67eae92460>

Powering better investment decisions. (n.d.). MSCI. <https://www.msci.com/>

MSCI c., (2023) *Climate and ESG indexes in focus: Let's get specific*. MSCI. <https://www.msci.com/www/blog-posts/climate-and-esg-indexes-in/03976285866>

R: *What is R?* (n.d.). <https://www.r-project.org/about.html>

SASB, *Materiality map*. (2023). SASB. <https://www.sasb.org/>

SDG's, *Transforming our world: the 2030 Agenda for Sustainable Development* | Department of Economic and Social Affairs. (2015.). <https://sdgs.un.org/2030agenda>

UK Government Web Archive. (n.d.).

Slopes. (2021). The EU Taxonomy: what is the impact for investors and corporates? *Corporate & Institutional Banking*. <https://cib.bnpparibas/the-eu-taxonomy-what-is-the-impact-for-investors-and-corporates/>

The Harvard Law School Forum on Corporate Governance. (2022, April 4). *EU Taxonomy and the Future of Reporting*. <https://corpgov.law.harvard.edu/2022/04/04/eu-taxonomy-and-the-future-of-reporting/#7>

The Harvard Law School Forum on Corporate Governance. (2023, February 18). *ESG: EU Regulatory Change and Its Implications*.

<https://corpgov.law.harvard.edu/2023/02/18/esg-eu-regulatory-change-and-its-implications/>

The Performance of ESG Indexes: Year in Review. (n.d.). MSCI.

<https://www.msci.com/www/blog-posts/the-performance-of-esg-indexes/03625107912>

UNFCCC. (2023). United Nation Climate Change. <https://unfccc.int/>

What is response bias and how can you avoid it? (2022, August 29). Qualtrics.

<https://www.qualtrics.com/experience-management/research/response-bias/>

WSJ, *How to Spot Greenwashing: When Companies Aren't as Green as They Claim.* (2023, April 24). WSJ. <https://www.wsj.com/video/series/wsj-glossary/how-to-spot-greenwashing-when-companies-arent-as-green-as-they-claim/59966923-0E1F-4EA2-86BD-F953481BF6C1>

Yahoo Finance. *Part of the Yahoo family of brands.* (2023).

<https://finance.yahoo.com/quote/EFX/>

Appendices

Appendix A: Qualitative analysis: The survey

Appendix B: Qualitative analysis: Results of the survey

Appendix C: Quantitative analysis: Statistical model and results

Appendix A: Qualitative analysis: The survey

Master thesis - Online survey

Start of Block: Question Tour Block 1



Dear respondent,

I am Arthur Dallemagne, a master's student in Business Engineering with a focus in International Finance at the Louvain School of Management, UCLouvain.

I am currently working on a research paper that assesses the impact of ESG factors on companies financial performances. This master's thesis is supervised by Frederic Pouchain, guest lecturer in finance at the LSM.

This survey is part of the qualitative analysis of the paper and aims at deep-diving into ESG strategies of companies in the BEL20 or other listed companies. We would like to understand better the challenges and opportunities arising for companies when building an ESG-aligned strategy.

The survey takes between 3 to 4 minutes to answer and results for this survey will be anonymised. The survey ends when you read a quick message to thank you.

I thank you very much for your contribution. Please let me know whether you would like to receive my conclusions afterward. I would be delighted to send them to you.

Arthur Dallemagne

Q1 What is the name of your company?

Q2 What is your function within the company?

Q3 What is your company's industry

- Energy
- Materials
- Industrials
- Consumer Discretionary
- Consumer Staples
- Health Care
- Financials
- Information Technology
- Communication Services
- Utilities
- Prefer not to say

Q4 What is your company Market Capitalisation? (EUR)

- < 500 million
- < 1 billion
- [1 - 5] billion
- [6 - 10] billion
- [11 - 15] billion
- [16 - 20] billion
- > 20 billion
- > 50 billion
- Prefer not to say

Q5 Within your company, the fact that your global strategy fully integrates Environmental, Social and Corporate Governance (ESG) matters is

- not necessary
 - a nice to have
 - a must have
-

Q6 Is your company global strategy aligned with the Paris Agreement? (*"legally binding international UN treaty under the UNFCCC to limit global warming well below 2°C, preferably to 1.5°C compared to pre-industrial levels"*)

- Yes
 - No
 - Not sure
-

Q7 Where do you communicate your non-financial information?

- Annual report
 - Independent "Sustainability" or "ESG" annual report
 - Others
-

Q8 Which framework do you use to disclose non-financial information? (*check all suitable boxes*)

- GRI (Global Reporting Initiative)
 - SASB (Sustainability Accounting Standards Board)
 - UN SDG's (United Nations Sustainable Development Goals)
 - UN Global Compact Index
 - TCFD (Task Force on Climate-related Financial Disclosures)
 - WEF Stakeholder Capitalist metric (World Economic Forum)
 - EU Taxonomy
 - Others _____
-

Q9 Is your sustainability report currently audited ?

- No
- Yes, partly
- Yes, completely

Q10 Do you feel it has become necessary to have ESG fully integrated in your global strategy to perform well in the coming years?

- Absolutely not
 - Not really
 - Neither yes or no
 - Yes, slightly
 - Yes, absolutely
-

Q11 Have you ever tried to measure the impact of your ESG initiatives on your financial performances?

- No
 - No but it is planned to do so
 - Yes
-

Q12 Have you ever observed a relationship between your ESG commitment, initiatives, actions and your financial performances on the stock market?

- No, I never tried to observe such a relationship
 - No, I never observed such a relationship
 - Yes, a significantly negative relationship
 - Yes, a slightly negative relationship
 - Yes, a slightly positive relationship
 - Yes, a significantly positive relationship
 - Prefer not to say
-

Q13 How would you expect this impact to evolve in the future?

- I expect a much bigger negative impact
- I expect a bigger negative impact
- I expect a negative impact to remain constant
- I expect a no-impact to remain constant
- I expect a positive impact to remain constant
- I expect a bigger positive impact
- I expect a much bigger positive impact

Please indicate whether you agree with the following statements

Q14 ESG disclosures represent one of your biggest sources of challenge for the next 5 years.

- Fully disagree
 - Disagree
 - Neither disagree nor agree
 - Agree
 - Fully agree
-

Q15 ESG initiatives bring value to your company and is reflected in your financial performances.

- Fully disagree
 - Disagree
 - Neither disagree nor agree
 - Agree
 - Fully agree
-

Q16 Performing better than your competitors on ESG areas gives you a competitive advantage and is reflected in your valuation when comparing to peers.

- Fully disagree
 - Disagree
 - Neither disagree nor agree
 - Agree
 - Fully agree
-

Q17 Fully integrating ESG into your global strategy required, requires or will require fundamental changes for your business model.

- Fully disagree
- Disagree
- Neither disagree nor agree
- Agree
- Fully agree

Q18 Fully integrating ESG in your global strategy enables

	Fully disagree	Disagree	Neither disagree nor agree	Agree	Fully agree
to boost innovation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
to attract & retain more talents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
to enhance customer relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
to improve your margins	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
to improve your profit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q19 Do you consider that the current regulation regarding ESG is clear enough?

- Yes
 - No
 - Neither yes or no
-

Q20 Do you expect the coming European regulation about ESG (i.e.: CSDR*) to impact your business?

(Corporate Sustainability Reporting Directive: " CSRD will apply to all EU companies, that is, EU companies exceeding at least two of the following criteria: more than 250 employees; a turnover of more than €40 million; or total assets of €20 million. The CSRD will require organisations to: Disclose sustainability risks including climate change risks, Detail the organisation's impact on society and environment, Identify material sustainability topics for stakeholders, Include targets and progress, Report in line with Sustainable Finance Disclosure Regulation (SFDR) and the EU Taxonomy Regulation. The CSRD also makes it mandatory for companies to have an audit of the sustainability information that they report. The first companies will have to apply the new rules for the first time in the 2024 financial year, for reports published in 2025.)*

- Absolutely not
 - Not really
 - Neither yes or no
 - Yes, slightly
 - Yes, absolutely
-

Q21 As a publicly traded company, taking into account current sustainable trends, do you consider your reputational risk linked to sustainability more carefully?

- Absolutely not
 - Not really
 - Neither yes or no
 - Yes, slightly
 - Yes, absolutely
-

Q22 Do you feel any influence or pressure from your investors related to your ESG policies?

- Absolutely not
 - Not really
 - Neither yes or no
 - Yes, slightly
 - Yes, absolutely
-

Q23 What is the biggest challenge you faced when implementing an ESG initiative?
(Optional)

Q24 What is the biggest opportunity you faced when implementing an ESG initiative?
(Optional)

Q25 Would you have any recommendation or advice for regulators establishing future legislations? *(Optional)*

Q26 I am available for a 30-minute interview to further develop this topical, fascinating and challenging topic in May:

No

Yes

End of Block: Question Tour Block 1

We thank you for your time spent taking this survey.
Your response has been recorded.

Contact:

Email: dallemagne.arthur@outlook.fr

Mobile: +32 472 74 44 44

LinkedIn: <https://www.linkedin.com/in/arthur-dallemagne/>

Appendix B: Qualitative analysis: Results of the survey

Q1 - What is the name of your company? (Optional)

What is the name of your company?

CFE

D'leteren Group

EDF

EVS Broadcast Equipment SA

Edison

Orange Belgium

Proximus

Recticel

UCB

ageas

Q2 - What is your function within the company? (Optional)

What is your function within the company?

Management

CEO

CFO

CFO

CFO

Ceo

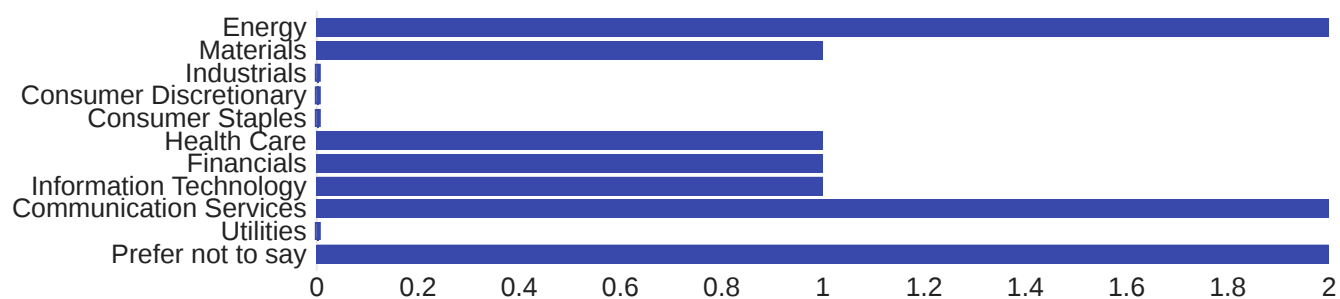
Chief Executive Officer

Head of M&A, Investments and IR

Investor Relations Lead

group director investor relations

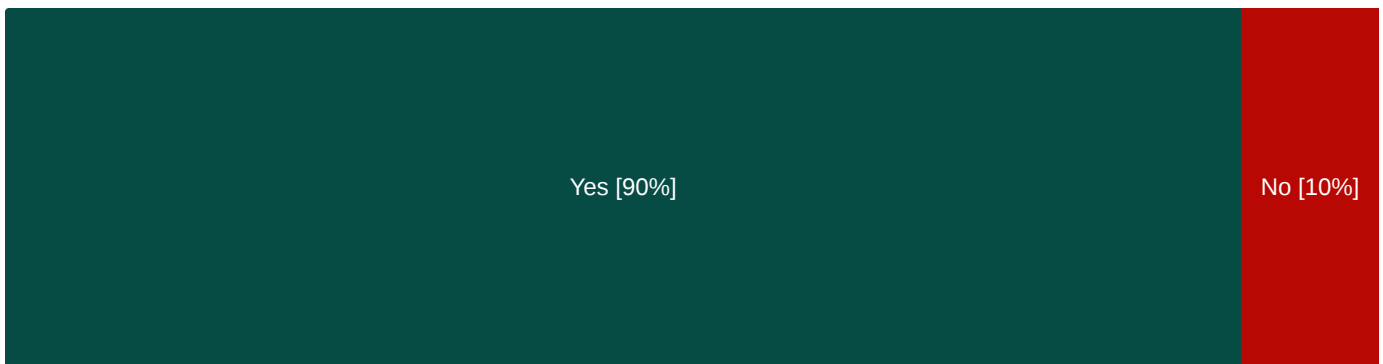
Q3 - What is your company's industry?



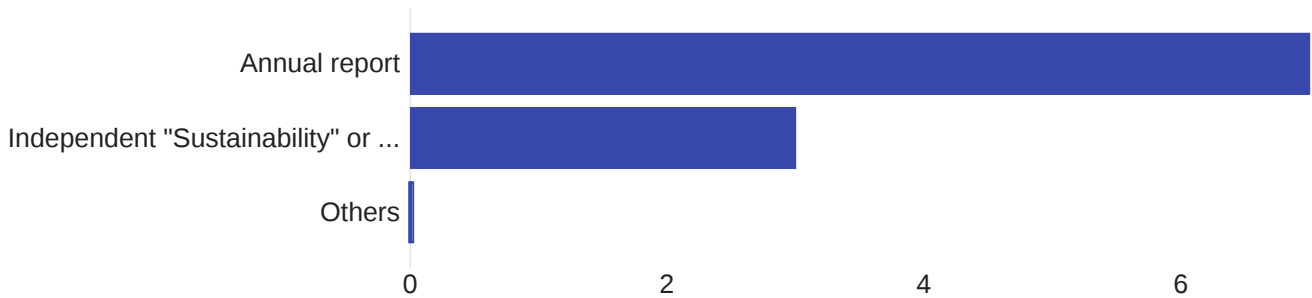
Q5 - Within your company, the fact that your global strategy fully integrates Environmental, Social and Corporate Governance (ESG) matters is



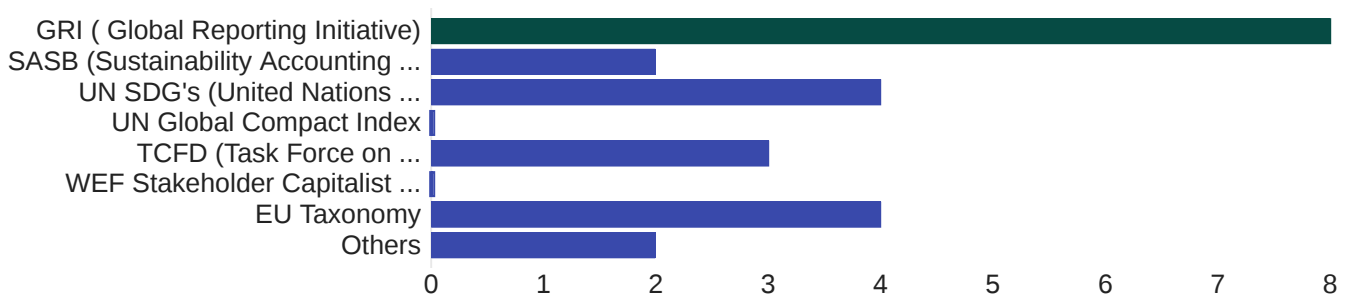
Q6 - Is your company global strategy aligned with the Paris Agreement? (*"legally binding international UN treaty under the UNFCCC to limit global warming well below 2°C, preferably to 1.5°C compared to pre-industrial levels")



Q7 - Where do you communicate your non-financial information?

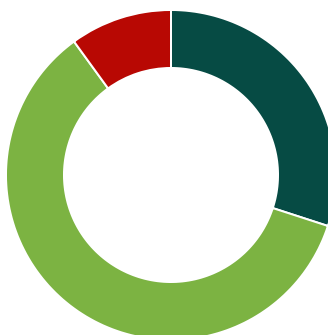


Q8 - Which framework do you use to disclose non-financial information? (check all suitable boxes)

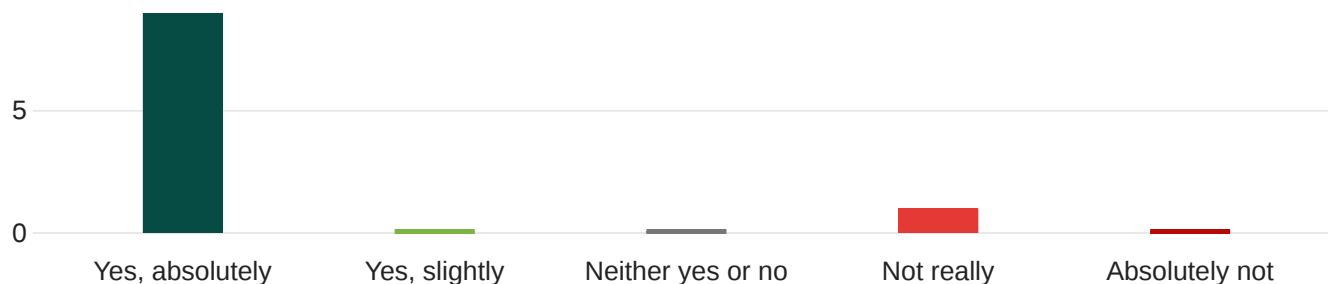


Q9 - Is your sustainability report currently audited ?

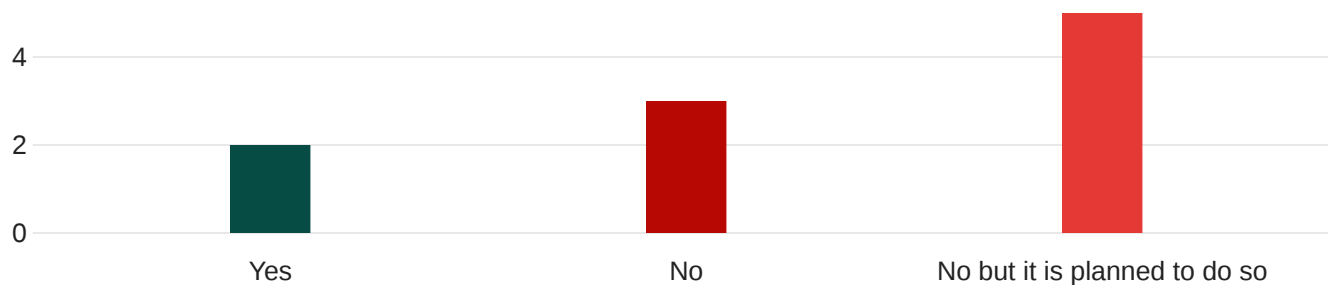
● Yes, completely ● Yes, partly ● No



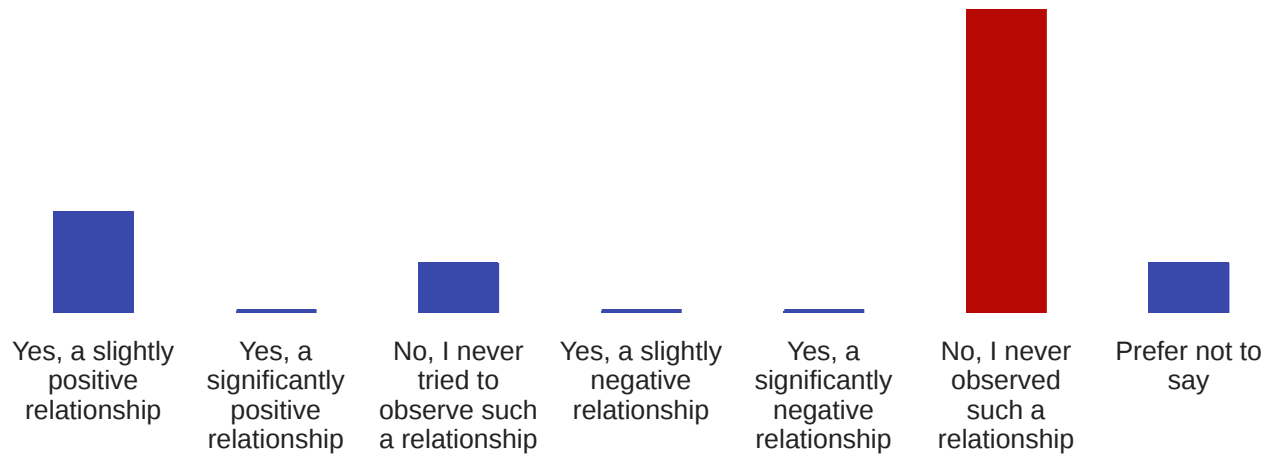
Q10 - Do you feel it has become necessary to have ESG fully integrated in your global strategy to perform well in the coming years?



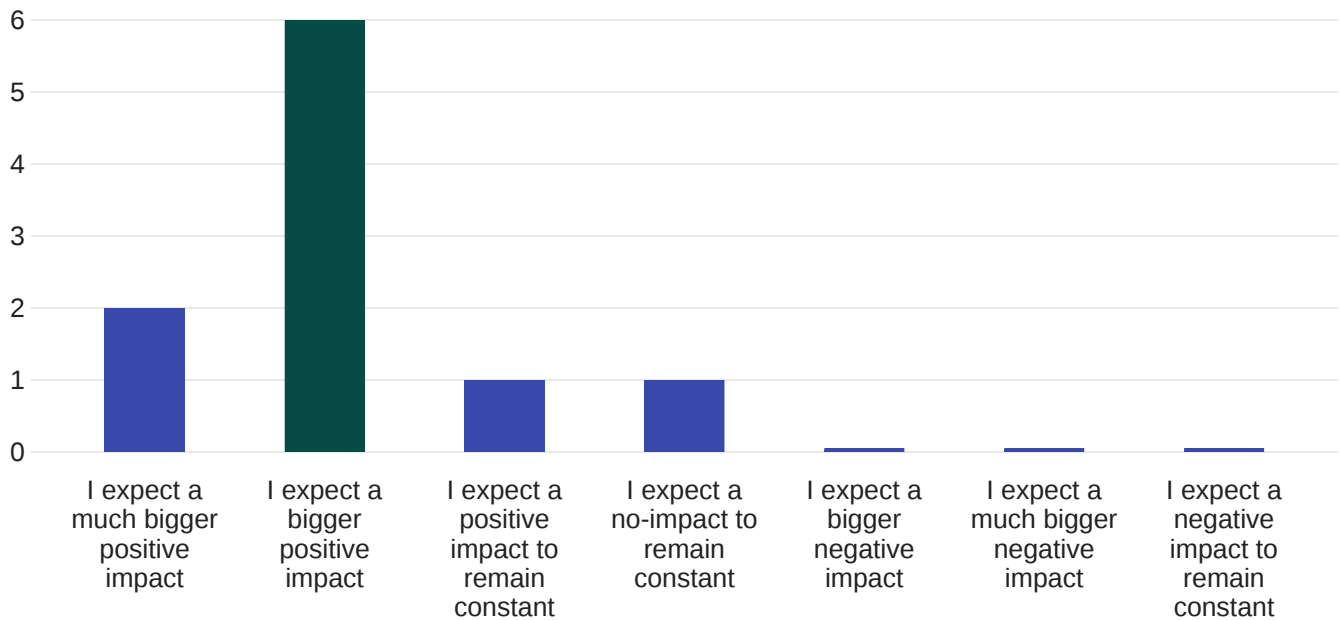
Q11 - Have you ever tried to measure the impact of your ESG initiatives on your financial performances?



Q12 - Have you ever observed a relationship between your ESG commitment, initiatives, actions and your financial performances on the stock market?

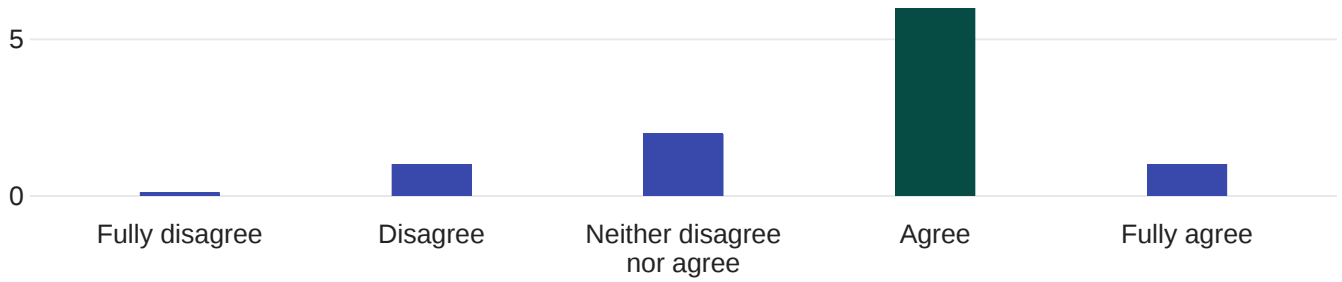


Q13 - How would you expect this impact to evolve in the future?

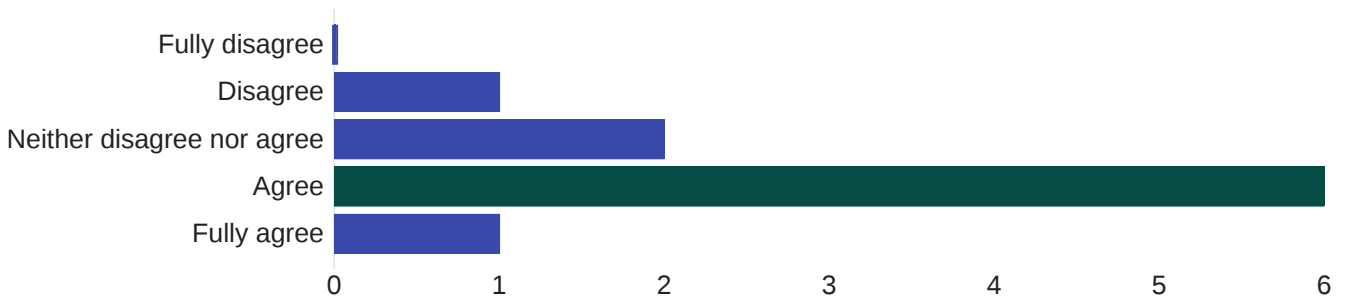


Please indicate whether you agree with the following statements

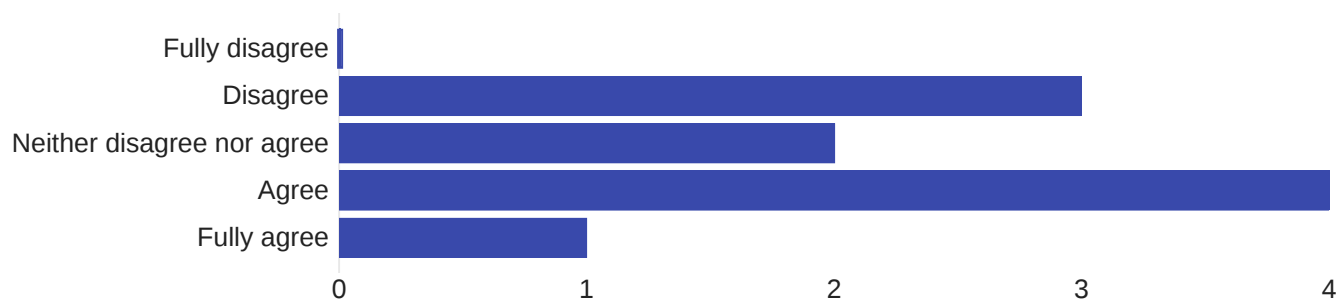
Q14 - ESG disclosures represent one of your biggest sources of challenge for the next 5 years.



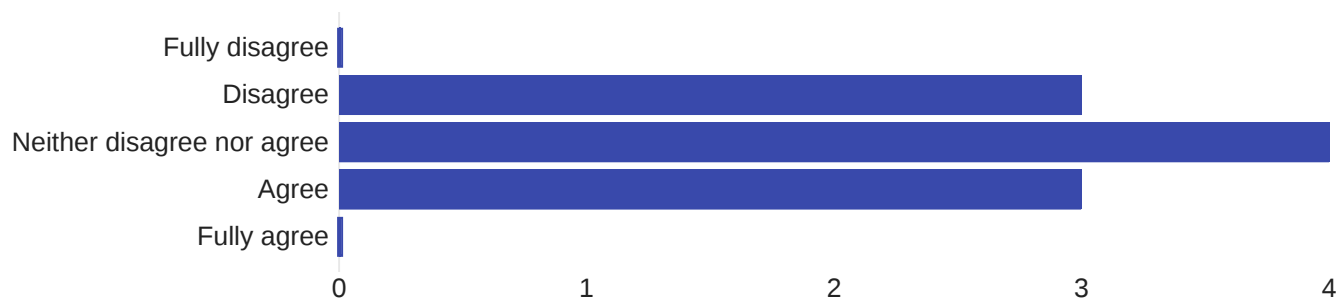
Q15 - ESG initiatives bring value to your company and is reflected in your financial performances.



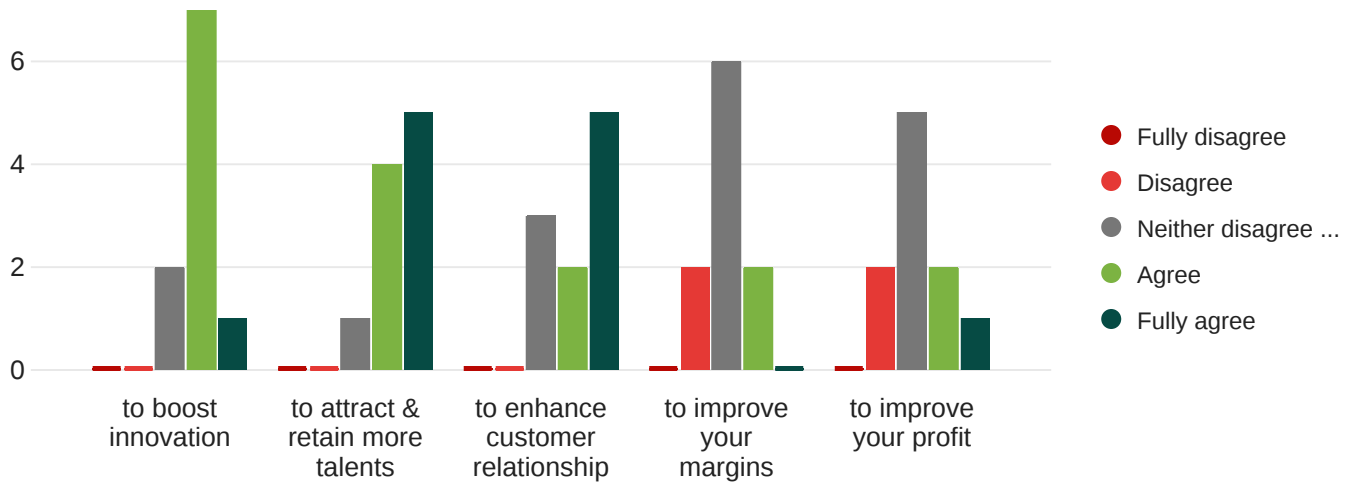
Q16 - Performing better than your competitors on ESG areas gives you a competitive advantage and is reflected in your valuation when comparing to peers.



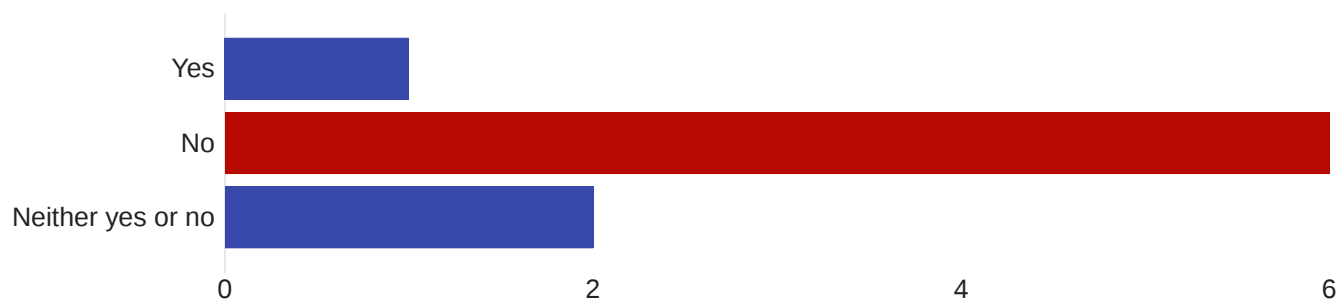
Q17 - Fully integrating ESG into your global strategy required, requires or will require fundamental changes for your business model.



Q18 - Fully integrating ESG in your global strategy enables

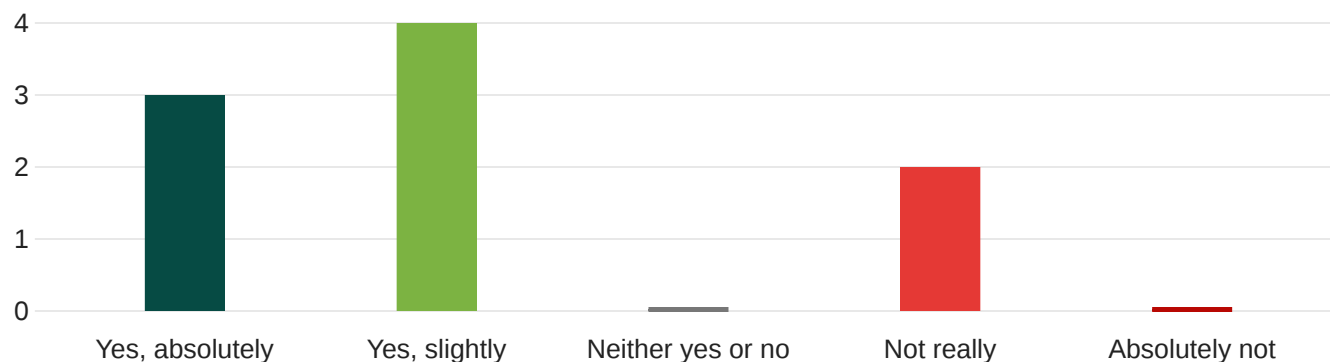


Q19 - Do you consider that the current regulation regarding ESG is clear enough?

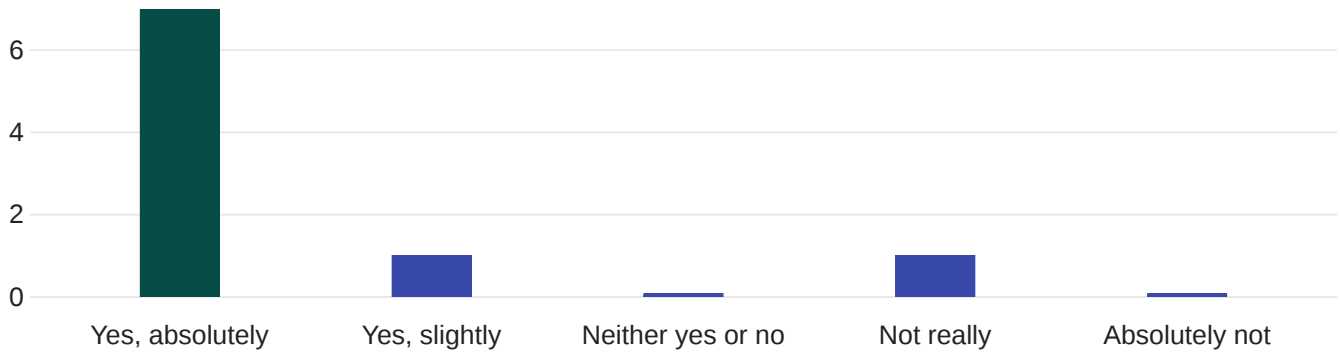


Q20 - Do you expect the coming European regulation about ESG (i.e.: CSDR*) to impact your business? (* Corporate Sustainability Reporting Directive: " CSRD will apply to

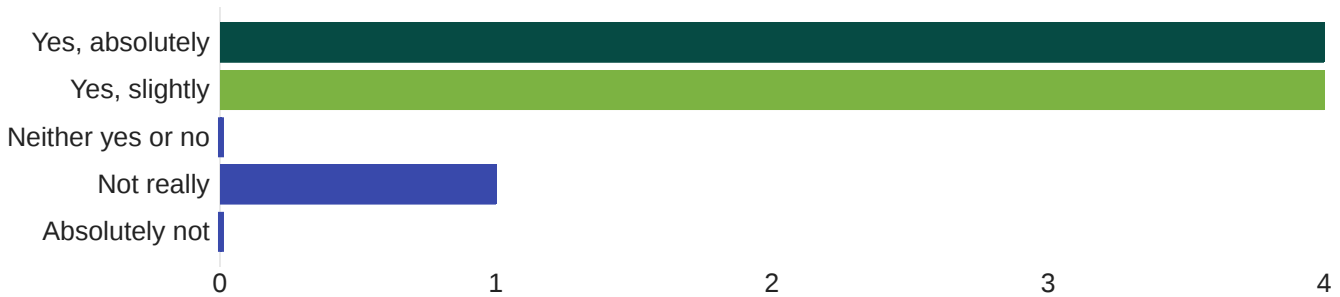
all EU companies, that is, EU companies exceeding at least two of the following criteria: more than 250 employees; a turnover of more than €40 million; or total assets of €20 million. The CSRD will require organisations to: Disclose sustainability risks including climate change risks, Detail the organisation's impact on society and environment, Identify material sustainability topics for stakeholders, Include targets and progress, Report in line with Sustainable Finance Disclosure Regulation (SFDR) and the EU Taxonomy Regulation. The CSRD also makes it mandatory for companies to have an audit of the sustainability information that they report. The first companies will have to apply the new rules for the first time in the 2024 financial year, for reports published in 2025.)



Q21 - As a publicly traded company, taking into account current sustainable trends, do you consider your reputational risk linked to sustainability more carefully?



Q22 - Do you feel any influence or pressure from your investors related to your ESG policies?



Q23 - What is the biggest challenge you faced when implementing an ESG initiative? (Optional)

What is the biggest challenge you faced when implementing an ESG initiative? (Optional)

Measuring, develop an approach based upon hard data

Gather the data, onboard people and keep track of the progress.

The fact that it is not yet part of our business culture and that will require a fundamental change of mindset

The biggest challenge is the amount of disclosure and the time/cost it will take rather than spending this time/resources in implementing the ESG initiatives.

To be able to compare with my peers as still lacking standardisation

Q24 - What is the biggest opportunity you faced when implementing an ESG initiative? (Optional)

What is the biggest opportunity you faced when implementing an ESG initiative? (Optional)

Aligning people and projects

Revisiting the supply chains and reinventing our various industries

Energy savings

µInnovation of our future models.

To strengthen company culture on sustainability and engagement with employees and customers

To be front runner on innovation

Q25 - Would you have any recommendation or advice for regulators establishing future legislations? (Optional)

Would you have any recommendation or advice for regulators establishing future legislations? (Optional)

Yes, to carefully analyse the reporting and the communication of all companies to identify, and eradicate green washing !

Keep it light and manageable. Be closer to the business life and leave their offices.
The way taxonomy is defined is stupid.

keep it simple, focus on the desired outcome without unnecessary workload

Be pragmatic and to the point

Reflect about the demands on disclosure, the burden it puts on companies, the realistic dimension of it, the risk it creates that activist investors will use it as a short term angle to destabilise the company.

Simplifying compliance and reporting

Appendix C: Quantitative analysis: Statistical model and results

Bloomberg_Energy.R

arthurdallemagne

2023-06-05

```
library(readxl)
library(rmarkdown)
library(ggplot2)

# Read the Bloomberg data
BloombergBESGenergy <- read_excel("/Users/arthurdallemagne/Documents/R_Main_folder_Thesis/Data/Benergy...")

# Subset the relevant columns within the Excel
df <- BloombergBESGenergy[, c("P/E", "ROE LF", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta")]

# Remove outliers based on Z-score method for the "P/E" column
z_scores <- scale(df$`P/E`)
threshold <- 1.3

# Identify outliers in the "P/E" column
outlier_indices <- which(abs(z_scores) > threshold)

# Remove outliers from the dataset
BloombergBESGenergy <- BloombergBESGenergy[-outlier_indices, ]

# Subset the relevant columns within the Excel
df_before_CS <- BloombergBESGenergy[, c("P/E", "ROE LF", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta")]

# Center and scale the columns used in the model
df_CS <- scale(df_before_CS)

# Replace the original columns with the centered and scaled columns
BloombergBESGenergy[, c("P/E", "ROE LF", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta")] <- df_CS
```

```
# calculate the correlation matrix for the relevant columns to make sure independant variables are not
```

```
cor(BloombergBESGenergy[c("ESG Scr", "Market Cap", "ROA LF", "Debt/Equity LF", "Beta")])
```

```
##           ESG Scr Market Cap      ROA LF Debt/Equity LF      Beta
## ESG Scr      1.000000000  0.3459735 -0.001628175      NA 0.17127357
## Market Cap  0.345973508  1.0000000  0.280216043      NA 0.15261208
## ROA LF      -0.001628175  0.2802160  1.000000000      NA 0.01249922
## Debt/Equity LF      NA      NA      NA      1      NA
## Beta        0.171273575  0.1526121  0.012499221      NA 1.00000000
```

```
# Fit linear regression model
```

```
model <- lm(`P/E` ~ `ESG Scr` + `Market Cap` + `ROA LF` + `Debt/Equity LF`, data = BloombergBESGenergy)
```

```
# View the summary of the model
```

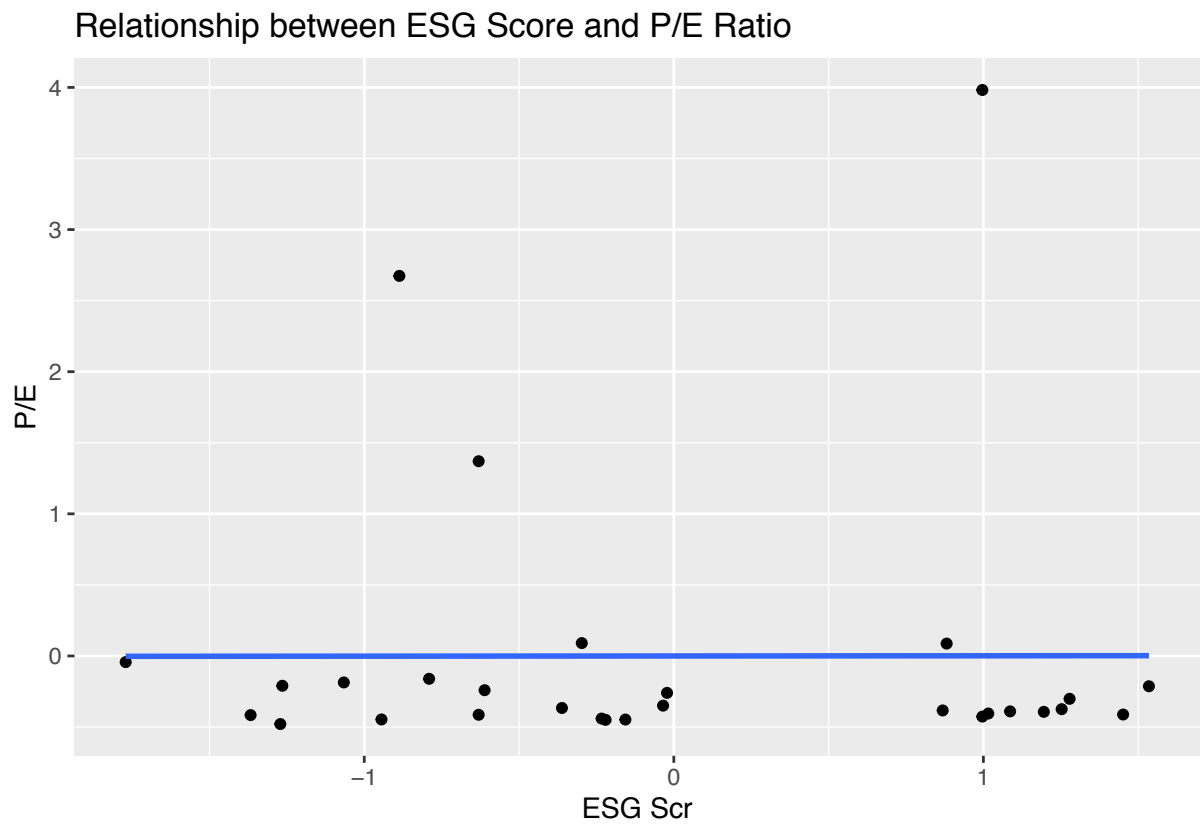
```
summary(model)
```

```
##
## Call:
## lm(formula = `P/E` ~ `ESG Scr` + `Market Cap` + `ROA LF` + `Debt/Equity LF`,
##     data = BloombergBESGenergy)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.95562 -0.34568 -0.26013 -0.04245  2.91227
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.01928    0.16901   0.114  0.9102
## `ESG Scr`       0.04376    0.18195   0.241  0.8121
## `Market Cap`   -0.01624    0.18871  -0.086  0.9322
## `ROA LF`       -0.28460    0.19032  -1.495  0.1484
## `Debt/Equity LF` 0.43375    0.18332   2.366  0.0268 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.8937 on 23 degrees of freedom
## (1 observation deleted due to missingness)
## Multiple R-squared:  0.3423, Adjusted R-squared:  0.2279
## F-statistic: 2.993 on 4 and 23 DF, p-value: 0.03988
```

```
# View regression relationship in a graph
```

```
ggplot(BloombergBESGenergy, aes(x = `ESG Scr`, y = `P/E`)) +
  geom_point() +
  geom_smooth(method = lm, se = FALSE) +
  labs(title = "Relationship between ESG Score and P/E Ratio")
```

```
## 'geom_smooth()' using formula 'y ~ x'
```



Bloomberg_Finance.R

arthurdallemagne

2023-06-05

```
library(readxl)
library(rmarkdown)
library(ggplot2)

# Read the Bloomberg data
BloombergBESGf <- read_excel("/Users/arthurdallemagne/Documents/R_Main_folder_Thesis/Data/Bfinance.xlsx")

# Subset the relevant columns within the Excel
df <- BloombergBESGf[, c("P/E", "EPS T12M", "ROE LF", "Market Cap", "ROA LF", "Debt/Equity LF", "Beta")]

# Remove outliers based on Z-score method for the "P/E" column
z_scores <- scale(df$`P/E`)
threshold <- 1.5

# Identify outliers in the "P/E" column
outlier_indices <- which(abs(z_scores) > threshold)

# Remove outliers from the dataset
BloombergBESGf <- BloombergBESGf[-outlier_indices, ]

# Subset the relevant columns within the Excel
df_before_CS <- BloombergBESGf[, c("P/E", "ROE LF", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta")]

# Center and scale the columns used in the model
df_CS <- scale(df_before_CS)

# Replace the original columns with the centered and scaled columns
BloombergBESGf[, c("P/E", "EPS T12M", "ROE LF", "Market Cap", "ROA LF", "Debt/Equity LF", "Beta")] <- df_CS
```

```
# Calculate the correlation matrix for the relevant columns to make sure independent variables are not
```

```
cor(BloombergBESGf[c("ESG Scr", "Market Cap", "ROA LF", "Debt/Equity LF", "Beta")])
```

```
##           ESG Scr Market Cap ROA LF Debt/Equity LF      Beta
## ESG Scr      1.0000000      NA      NA      1.0000000 0.2010514
## Market Cap      NA          1      NA          NA          NA
## ROA LF          NA          NA      1          NA          NA
## Debt/Equity LF 1.0000000      NA      NA      1.0000000 0.2010514
## Beta           0.2010514      NA      NA      0.2010514 1.0000000
```

```
# Fit linear regression model with P/E as dependent variable
```

```
model <- lm(`P/E` ~ `ESG Scr` + `Market Cap` + `ROA LF` + `Debt/Equity LF` + `Beta`, data = BloombergBESGf)
```

```
# View the summary of the model with P/E as dependent variable
```

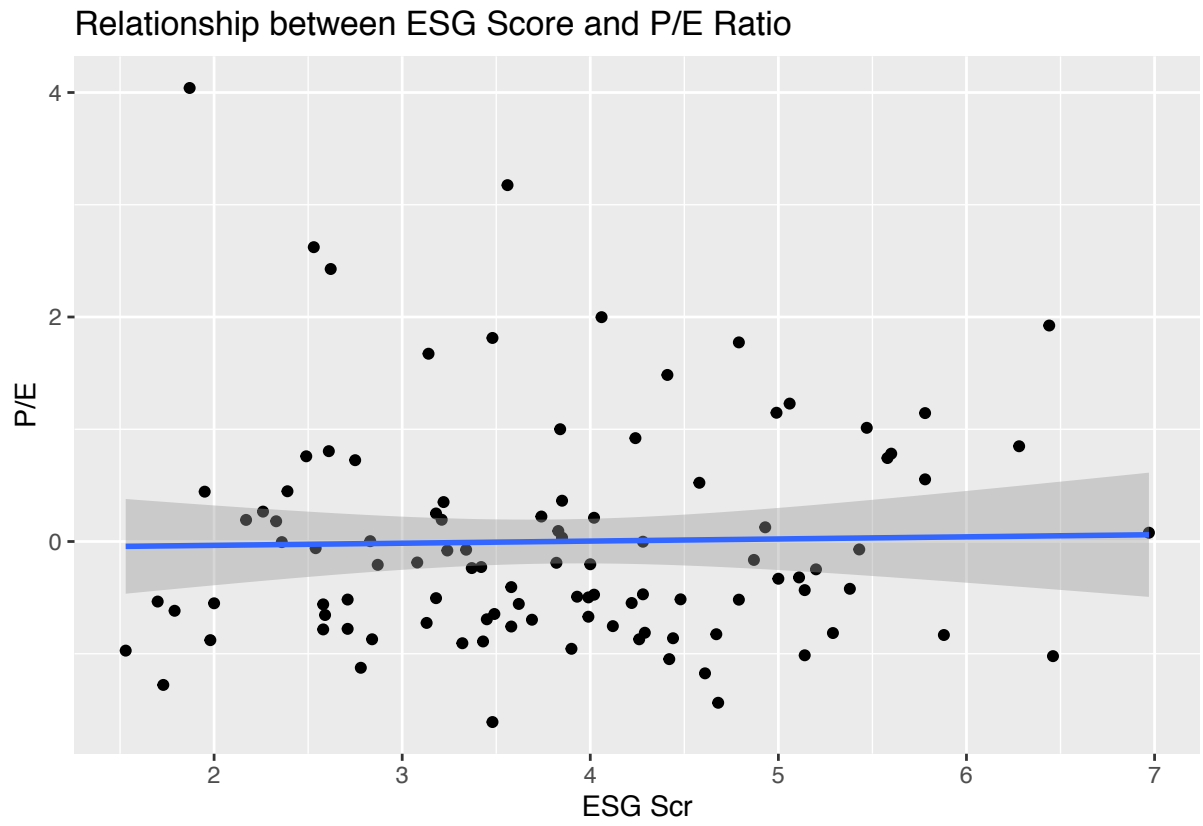
```
summary(model)
```

```
##
## Call:
## lm(formula = `P/E` ~ `ESG Scr` + `Market Cap` + `ROA LF` + `Debt/Equity LF` +
##     Beta, data = BloombergBESGf)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.4434 -0.6385 -0.1582  0.3784  3.8569
##
## Coefficients: (1 not defined because of singularities)
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.33049    0.32162  -1.028  0.30675
## `ESG Scr`      0.08395    0.08137   1.032  0.30485
## `Market Cap`  -0.09779    0.09961  -0.982  0.32870
## `ROA LF`      -0.34074    0.10604  -3.213  0.00179 **
## `Debt/Equity LF` NA          NA          NA          NA
## Beta          -0.15542    0.10182  -1.526  0.13023
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.9349 on 95 degrees of freedom
## (3 observations deleted due to missingness)
## Multiple R-squared:  0.1504, Adjusted R-squared:  0.1146
## F-statistic: 4.204 on 4 and 95 DF, p-value: 0.003537
```

```
# View regression relationship in a graph
```

```
ggplot(BloombergBESGf, aes(x = `ESG Scr`, y = `P/E`)) +
  geom_point() +
  geom_smooth(method = lm) +
  labs(title = "Relationship between ESG Score and P/E Ratio")
```

```
## 'geom_smooth()' using formula 'y ~ x'
```



Bloomberg_Real_Estate.R

arthurdallemagne

2023-06-05

```
library(readxl)
library(rmarkdown)
library(ggplot2)

# Read the Bloomberg data
BloombergBESGre <- read_excel("/Users/arthurdallemagne/Documents/R_Main_folder_Thesis/Data/Bre.xlsx", sheet = "Bloomberg")

# Subset the relevant columns within the Excel
df <- BloombergBESGre[, c("P/E", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta")]

# Remove outliers based on Z-score method for the "P/E" column
z_scores <- scale(df$`P/E`)
threshold <- 1

# Identify outliers in the "P/E" column
outlier_indices <- which(abs(z_scores) > threshold)

# Remove outliers from the dataset
BloombergBESGre <- BloombergBESGre[-outlier_indices, ]

# Subset the relevant columns within the excel
df_before_CS <- BloombergBESGre[, c("P/E", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta")]

# Center and scale the columns used in the model
df_CS <- scale(df_before_CS)

# Replace the original columns with the centered and scaled columns
BloombergBESGre[, c("P/E", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta")] <- df_CS
```

```
# calculate the correlation matrix for the relevant columns to make sure independent variables are not
```

```
cor(BloombergBESGre[c("ESG Scr", "Market Cap", "ROA LF", "Debt/Equity LF", "Beta")])
```

```
##           ESG Scr Market Cap ROA LF Debt/Equity LF Beta
## ESG Scr           1         NA     NA           NA     NA
## Market Cap        NA          1     NA           NA     NA
## ROA LF            NA          NA     1           NA     NA
## Debt/Equity LF    NA          NA     NA           1     NA
## Beta              NA          NA     NA           NA     1
```

```
# Fit linear regression model
```

```
model <- lm(`P/E` ~ `ESG Scr` + `Market Cap` + `ROA LF` + `Debt/Equity LF`, data = BloombergBESGre)
```

```
# View the summary of the model
```

```
summary(model)
```

```
##
## Call:
## lm(formula = 'P/E' ~ 'ESG Scr' + 'Market Cap' + 'ROA LF' + 'Debt/Equity LF',
##     data = BloombergBESGre)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.1051 -0.5359 -0.2967  0.4820  2.5139
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  7.535e-18  1.485e-01  0.000    1.000
## 'ESG Scr'    -1.633e-03  1.652e-01 -0.010    0.992
## 'Market Cap'  2.380e-01  1.617e-01  1.473    0.150
## 'ROA LF'     -5.097e-01  1.694e-01 -3.008    0.005 **
## 'Debt/Equity LF' -1.480e-01  1.763e-01 -0.840    0.407
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.9156 on 33 degrees of freedom
## (2 observations deleted due to missingness)
## Multiple R-squared:  0.2522, Adjusted R-squared:  0.1616
## F-statistic: 2.783 on 4 and 33 DF, p-value: 0.04264
```

```
# View regression relationship in a graph
```

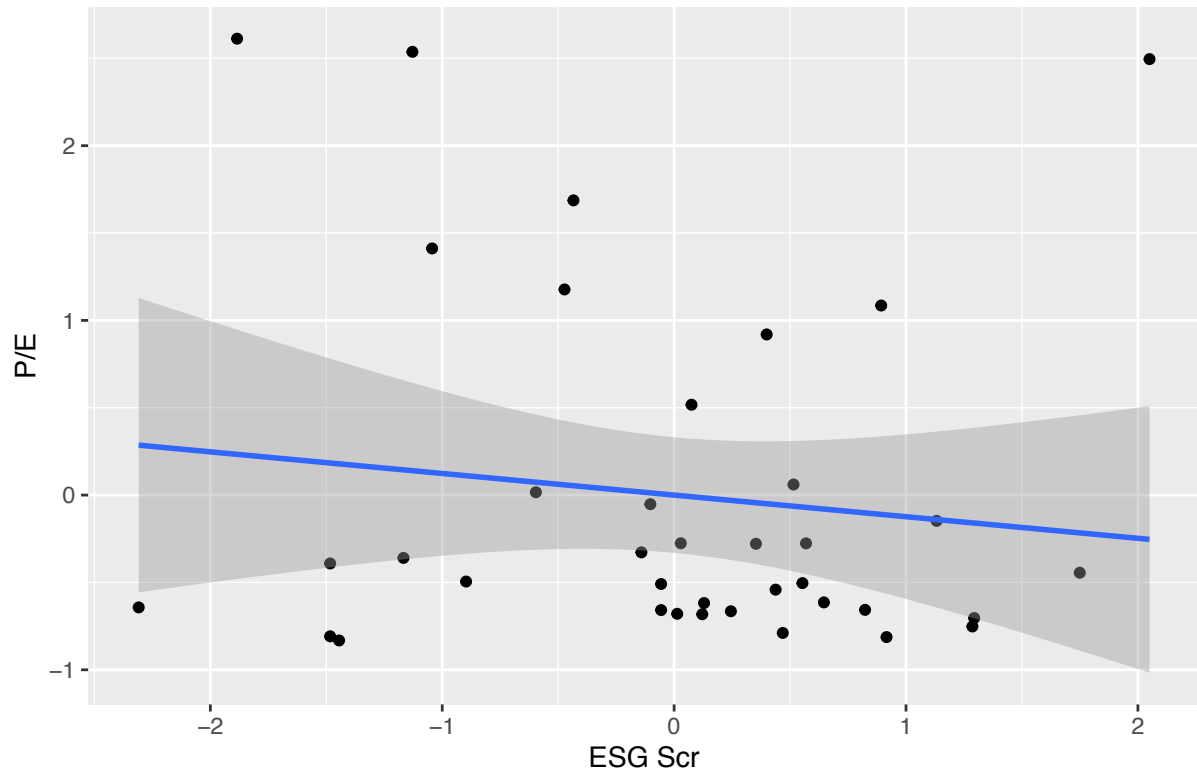
```
library(ggplot2)
ggplot(BloombergBESGre, aes(x = `ESG Scr`, y = `P/E`)) +
  geom_point() +
  geom_smooth(method = lm) +
  labs(title = "Relationship between ESG Score and P/E Ratio")
```

```
## 'geom_smooth()' using formula 'y ~ x'
```

```
## Warning: Removed 2 rows containing non-finite values (stat_smooth).
```

```
## Warning: Removed 2 rows containing missing values (geom_point).
```

Relationship between ESG Score and P/E Ratio



Bloomberg_Materials.R

arthurdallemagne

2023-06-05

```
library(readxl)
library(rmarkdown)
library(ggplot2)

# Read the Bloomberg data
BloombergBESGmaterials <- read_excel("/Users/arthurdallemagne/Documents/R_Main_folder_Thesis/Data/Bmater

# Subset the relevant columns within the Excel
df <- BloombergBESGmaterials[, c("P/E", "ROE LF", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "I

# Remove outliers based on Z-score method for the "P/E" column
z_scores <- scale(df$`P/E`)
threshold <- 1

# Identify outliers in the "P/E" column
outlier_indices <- which(abs(z_scores) > threshold)

# Remove outliers from the dataset
BloombergBESGmaterials <- BloombergBESGmaterials[-outlier_indices, ]

# Subset the relevant columns within the excel
df_before_CS <- BloombergBESGmaterials[, c("P/E", "ROE LF", "Market Cap", "ROA LF", "Debt/Equity LF", "E

# Center and scale the columns used in the model
df_CS <- scale(df_before_CS)

# Replace the original columns with the centered and scaled columns
BloombergBESGmaterials[, c("P/E", "ROE LF", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta").
```

```
# calculate the correlation matrix for the relevant columns to make sure independent variables are not
```

```
cor(BloombergBESGmaterials[c("ESG Scr", "Market Cap", "ROA LF", "Debt/Equity LF", "Beta")])
```

```
##           ESG Scr Market Cap ROA LF Debt/Equity LF      Beta
## ESG Scr      1.0000000  0.2306171      NA           NA  0.1954966
## Market Cap   0.2306171  1.0000000      NA           NA  0.1443232
## ROA LF       NA         NA          1           NA      NA
## Debt/Equity LF NA         NA          NA          1           NA
## Beta         0.1954966  0.1443232      NA           NA  1.0000000
```

```
# Fit linear regression model
```

```
model <- lm(`P/E` ~ `ESG Scr` + `Market Cap` + `ROA LF` + `Debt/Equity LF` + `Beta`, data = BloombergBE
```

```
# View the summary of the model
```

```
summary(model)
```

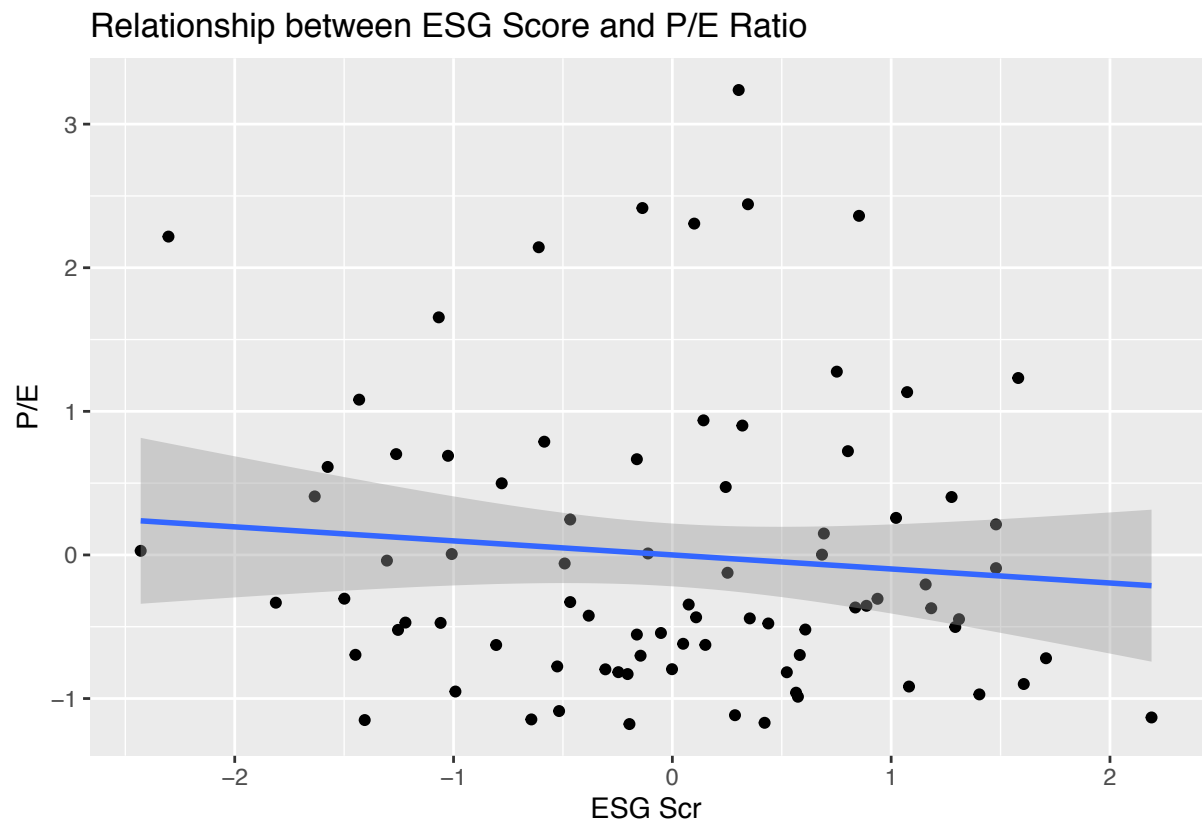
```
##
## Call:
## lm(formula = `P/E` ~ `ESG Scr` + `Market Cap` + `ROA LF` + `Debt/Equity LF` +
##     Beta, data = BloombergBESGmaterials)
##
## Residuals:
##     Min       1Q   Median       3Q      Max
## -1.4152 -0.6078 -0.2721  0.4064  2.7309
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.01301    0.10587   0.123   0.9025
## `ESG Scr`      -0.17460    0.11137  -1.568   0.1211
## `Market Cap`   0.25284    0.11084   2.281   0.0253 *
## `ROA LF`      -0.28674    0.11431  -2.508   0.0143 *
## `Debt/Equity LF` 0.02783    0.11270   0.247   0.8056
## Beta           0.03098    0.10990   0.282   0.7788
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.9587 on 76 degrees of freedom
## (1 observation deleted due to missingness)
## Multiple R-squared:  0.1356, Adjusted R-squared:  0.07869
## F-statistic: 2.384 on 5 and 76 DF, p-value: 0.046
```

```
# View regression relationship in a graph
```

```
library(ggplot2)
ggplot(BloombergBESGmaterials, aes(x = `ESG Scr`, y = `P/E`)) +
  geom_point() +
```

```
geom_smooth(method = lm) +  
labs(title = "Relationship between ESG Score and P/E Ratio")
```

```
## 'geom_smooth()' using formula 'y ~ x'
```



Bloomberg_Consumer_Discretionary.R

arthurdallemagne

2023-06-05

```
library(readxl)
library(rmarkdown)
library(ggplot2)

# Read the Bloomberg data
BloombergBESGcd <- read_excel("/Users/arthurdallemagne/Documents/R_Main_folder_Thesis/Data/Bcd.xlsx", sheet = "Bcd")

# Subset the relevant columns within the Excel
df <- BloombergBESGcd[, c("P/E", "ROE LF", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta")]

# Remove outliers based on Z-score method for the "P/E" column
z_scores <- scale(df$`P/E`)
threshold <- 1.7

# Identify outliers in the "P/E" column
outlier_indices <- which(abs(z_scores) > threshold)

# Remove outliers from the dataset
BloombergBESGcd <- BloombergBESGcd[-outlier_indices, ]

# Subset the relevant columns within the Excel
df_before_CS <- BloombergBESGcd[, c("P/E", "ROE LF", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta")]

# Center and scale the columns used in the model
df_CS <- scale(df_before_CS)

# Replace the original columns with the centered and scaled columns
BloombergBESGcd[, c("P/E", "ROE LF", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta")] <- df_CS
```

```
# calculate the correlation matrix for the relevant columns to make sure independant variables are not
```

```
cor(BloombergBESGcd[c("ESG Scr", "Market Cap", "ROA LF", "Debt/Equity LF", "Beta")])
```

```
##           ESG Scr Market Cap      ROA LF Debt/Equity LF      Beta
## ESG Scr      1.00000000 0.03647504 -0.04172374      NA -0.02214363
## Market Cap   0.03647504 1.00000000  0.20204179      NA  0.28166984
## ROA LF       -0.04172374 0.20204179  1.00000000      NA -0.09977938
## Debt/Equity LF      NA          NA          NA          1      NA
## Beta        -0.02214363 0.28166984 -0.09977938      NA  1.00000000
```

```
# Fit linear regression model
```

```
model <- lm(`P/E` ~ `ESG Scr` + `Market Cap` + `ROA LF` + `Debt/Equity LF`, data = BloombergBESGcd)
```

```
# View the summary of the model
```

```
summary(model)
```

```
##
## Call:
## lm(formula = 'P/E' ~ 'ESG Scr' + 'Market Cap' + 'ROA LF' + 'Debt/Equity LF',
##     data = BloombergBESGcd)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.3105 -0.6161 -0.2171  0.3162  2.7407
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.00391    0.11655  -0.034  0.97334
## 'ESG Scr'      -0.21438    0.11837  -1.811  0.07489 .
## 'Market Cap'    0.31962    0.11790   2.711  0.00864 **
## 'ROA LF'        0.01731    0.12342   0.140  0.88894
## 'Debt/Equity LF' 0.24176    0.12479   1.937  0.05719 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.9605 on 63 degrees of freedom
## (4 observations deleted due to missingness)
## Multiple R-squared:  0.1603, Adjusted R-squared:  0.107
## F-statistic: 3.006 on 4 and 63 DF, p-value: 0.02466
```

```
# View regression relationship in a graph
```

```
ggplot(BloombergBESGcd, aes(x = `ESG Scr`, y = `P/E`)) +
  geom_point() +
  geom_smooth(method = lm) +
  labs(title = "Relationship between ESG Score and P/E Ratio")
```

```
## 'geom_smooth()' using formula 'y ~ x'
```


Bloomberg_Technology.R

arthurdallemagne

2023-06-05

```
library(readxl)
library(rmarkdown)
library(ggplot2)

# Read the Bloomberg data
BloombergBESGt <- read_excel("/Users/arthurdallemagne/Documents/R_Main_folder_Thesis/Data/Btech.xlsx", s

# Subset the relevant columns within the Excel
df <- BloombergBESGt[, c("P/E", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta")]

# Remove outliers based on Z-score method for the "P/E" column
z_scores <- scale(df$`P/E`)
threshold <- 1.5

# Identify outliers in the "P/E" column
outlier_indices <- which(abs(z_scores) > threshold)

# Remove outliers from the dataset
BloombergBESGt <- BloombergBESGt[-outlier_indices, ]

# Subset the relevant columns within the excel
df_before_CS <- BloombergBESGt[, c("P/E", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta")]

# Center and scale the columns used in the model
df_CS <- scale(df_before_CS)

# Replace the original columns with the centered and scaled columns
BloombergBESGt[, c("P/E", "Market Cap", "ROA LF", "Debt/Equity LF", "ESG Scr", "Beta")] <- df_CS
```

```
# calculate the correlation matrix for the relevant columns to make sure independent variables are not
```

```
cor(BloombergBESGt[c("ESG Scr", "Market Cap", "ROA LF", "Debt/Equity LF", "Beta")])
```

```
##           ESG Scr Market Cap      ROA LF Debt/Equity LF      Beta
## ESG Scr      1.00000000  0.4167989  0.1782735    0.09289174  0.01208606
## Market Cap   0.41679895  1.0000000  0.1448599   -0.13216148  0.19518235
## ROA LF       0.17827355  0.1448599  1.0000000   -0.28522507  0.28454406
## Debt/Equity LF 0.09289174 -0.1321615 -0.2852251    1.00000000 -0.18543134
## Beta         0.01208606  0.1951824  0.2845441   -0.18543134  1.00000000
```

```
# Fit linear regression model
```

```
model <- lm(`P/E` ~ `ESG Scr` + `Market Cap` + `ROA LF` + `Debt/Equity LF`, data = BloombergBESGt)
```

```
# View the summary of the model
```

```
summary(model)
```

```
##
## Call:
## lm(formula = `P/E` ~ `ESG Scr` + `Market Cap` + `ROA LF` + `Debt/Equity LF`,
##     data = BloombergBESGt)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.76835 -0.72841 -0.02085  0.47088  2.12745
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -1.887e-16  1.437e-01   0.000  1.0000
## `ESG Scr`     -2.829e-01  1.651e-01  -1.713  0.0953 .
## `Market Cap`  2.693e-01  1.631e-01   1.652  0.1073
## `ROA LF`     -3.769e-01  1.555e-01  -2.424  0.0205 *
## `Debt/Equity LF` -4.785e-02  1.560e-01  -0.307  0.7608
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.9204 on 36 degrees of freedom
## Multiple R-squared:  0.2376, Adjusted R-squared:  0.1529
## F-statistic: 2.805 on 4 and 36 DF, p-value: 0.03994
```

```
#View regression relationship in a graph
```

```
library(ggplot2)
ggplot(BloombergBESGt, aes(x = `ESG Scr`, y = `P/E`)) +
  geom_point() +
  geom_smooth(method = lm) +
  labs(title = "Relationship between ESG Score and P/E Ratio")
```

```
## 'geom_smooth()' using formula 'y ~ x'
```

